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**An Annotated Bibliography of MANPRINT-Related  
Assessments and Evaluations Conducted by the  
U.S. Army, 2nd Edition: 1953 to 2009  
Volume III – Test and Evaluation Reports**

by Sam E. Middlebrooks, Ph.D.

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ARL-SR-190

February 2010

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## **An Annotated Bibliography of MANPRINT-Related Assessments and Evaluations Conducted by the U.S. Army, 2nd Edition: 1953 to 2009 Volume III –Test and Evaluation Reports**

**Sam E. Middlebrooks, Ph.D.  
Human Research and Engineering Directorate, ARL**

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## Foreword

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### 1. Introduction.

This section provides a general overview of this bibliography along with comments on how to best utilize it in both its manual and automated forms.

This publication is intended for those MANPRINT practitioners who, for whatever reason, need to know if or what MANPRINT work has been performed on a particular system or system type and when. Also, an inquiry might take the form, ‘... well, I know that Joe Smith did a study on a like system a few years ago...’. This bibliography also serves this type of inquiry and can provide a reference on which systems have been studied and when. The significance is that when a new system study is being contemplated or started then one of the first things the principal investigator (PI) is interested in is what issues have been identified for this type of system in the past to use as a benchmark to see if the new system is being designed with the same problems in it that historical knowledge has shown to be a problem.

Because of the size this report has been divided into 3 volumes. Volume I, titled the Index, consists of an introduction to the series and a set of table oriented indexes designed to give the reader the ability to focus into a desired past study when only limited, or no, knowledge exists. All the index tables contain the columns of year of the study, short name for the study, long name for the study, and type of study, i.e., a MANPRINT Assessment (MA) or a Test & Evaluation Report (T&ER).

Volume II contains the annotated bibliography of the 583 MA reports reviewed by this paper. MANPRINT Assessments are performed according to the direction of AR 602-2. They consist of an evaluation of all 7 MANPRINT domains and a summary of the findings. The approving authority for these MAs is the DA G1 for MANPRINT. Once the MA has been approved by this office it is used as an input document for ASARC and Milestone Decision Reviews for the system being evaluated. The lead performing organization for MAs is the Human Research and Engineering Directorate (HRED) of the U.S. Army Research Laboratory (ARL). ARL-HRED will perform the MPT and HFE portions of the MA directly and will coordinate with other agencies for the other domain reports as appropriate. ARL-HRED will then consolidate all of the domain reports into a draft MA and forward it to DA G1 - MANPRINT for approval.

Volume III contains the annotated bibliography of the 443 T&ERs reviewed by this paper. A T&ER is a system evaluation performed according to AR 73-1 for all systems in development in the Army except those developed by MEDCOM and SOCOM. The U.S. Army Test and Evaluation Command (ATEC) conducts these evaluations according to AR 73-1 through its subordinate commands the U.S. Army Evaluation Center (AEC), the U.S. Army Development Command (DTC), and the U.S. Army Operational Test Command (OTC). The Test &

Evaluation (T&E) process is very structured and typically produces a series of documents related to the system under test that may include (as required) an event design plan (EDP), a test data report (TDR), and a system evaluation report or operational test agency evaluation report (SER before 2008 and OER after 2008).

#### 1.1. Performing Organizations.

MANPRINT studies documented in this report were performed by the following organizations:

- Military Operations Research Society (MORS), Alexandria, VA.
- U.S. Air Force, Air Proving Ground Center, Eglin Air Force Base, FL.
- U.S. Army Aviation Technical Test Center, Fort Rucker, AL.
- U.S. Army Chemical Research and Development Laboratory, Edgewood Arsenal, MD.
- U.S. Army Combat Systems Test Activity (Prov), Aberdeen Proving Ground, MD.
- U.S. Army Directorate of Flight Standards and Qualification Research, St. Louis, MO.
- U.S. Army Dugway Proving Ground, UT.
- U.S. Army Electronic Proving Ground (EPG), Fort Huachuca, AZ.
- U.S. Army Evaluation Analysis Center (EAC), Aberdeen Proving Ground, MD.
- U.S. Army Evaluation Center (AEC), Aberdeen Proving Ground, MD.
- U.S. Army Frankford Arsenal, Philadelphia, PA.
- U.S. Army Human Engineering Laboratory (HEL), Aberdeen Proving Ground, MD.
- U.S. Army Materiel Test and Evaluation Directorate, White Sands Missile Range, NM.
- U.S. Army Natick Research, Development and Engineering Center, Natick, MA.
- U.S. Army Operational Test and Evaluation Command (OPTEC), Alexandria, VA
- U.S. Army Operational Test Command (OTC), Fort Hood, TX.
- U.S. Army Research Institute (ARI) for the Behavioral and Social Sciences. Alexandria, VA.
- U.S. Army Research Laboratory (ARL), Human Research and Engineering Directorate (HRED), Aberdeen Proving Ground, MD.
- U.S. Army Research Office (ARO), Research Triangle Park, NC.
- U.S. Army Test and Evaluation Command (ATEC), Alexandria, VA.
- U.S. Army Troop Support and Aviation Materiel Readiness Command, St. Louis, MO.

- U.S. Navy Air Test Center, Patuxent River, MD.

## 1.2. Sources of Data.

MANPRINT reports documented in this bibliography came from the following sources:

- Scientific & Technical Information Network (STINET) library of the Defense Technical Information Center (DTIC) web page: <https://dtic-stinet.dtic.mil/>.
- National Technical Information Service (NTIS): <http://www.ntis.gov/>.
- Library archives of the U.S. Army Research Laboratory (ARL), Human Research and Engineering Directorate (HRED), (formerly U.S. Army Human Engineering Laboratory (HEL), Aberdeen Proving Ground, MD.
- Unpublished MANPRINT files at ARL-HRED, Aberdeen Proving Ground, MD.
- Library archives of the U.S. Army Research Institute (ARI), Alexandria, VA.
- ARL Inside Web page: <https://arlinde.arl.army.mil/>.
- ARL Technical Library WEBCAT Web Page: <https://arllit.arl.army.mil/>.
- Library archives at the U.S. Army Operational Test Command (formerly TEXCOM) of the U.S. Army Research Institute at Fort Hood, TX.
- Library archives of the U.S. Army Research Laboratory, Fort Hood Field Element, Fort Hood, TX.
- Library archives of the U.S. Army Research Laboratory, ARDEC Field Element, Picatinny, NJ.
- Library archives of the U.S. Army Research Laboratory, PM SWAR Field Element, Fort Belvoir, VA.
- Library archives of the U.S. Army Research Laboratory, Fort Rucker Field Element, Fort Rucker, AL.

## 1.3. Document Types.

The reports and documents in this report consist of a variety of formats and types. These are:

### 1.3.1. Formal published reports from DTIC.

These documents have been published by the originating organization in the appropriate technical report format for that organization and submitted to the DTIC for inclusion in the technical reports national archive. Each of these reports contains a reference to the DTIC control number so it can be accessed by qualified government and other personnel in the archive. A sample of DTIC control number formats is:

- ADA123123 – reports that have no distribution limitations and are available to the general public.
- ADB123123 – reports that are unclassified but have distribution limited to qualified government employees and their contractors.
- ADC123123 – reports that are classified at the confidential or secret level with controlled access. The description of these reports is unclassified as listed in this report, however, the actual report is subject to the distribution controls and access limits as stated in the document.

### 1.3.2. Formal published technical reports.

These documents have been published in a technical or other report format by the originating organization in the appropriate technical report format for that organization. Typical organizations publishing these types of reports are the U.S. Army Test & Evaluation Command, U.S. Army Research Institute, U.S. Army Research Laboratory's Human Research and Engineering Directorate and the U.S. Army Human Engineering Laboratory before it. These reports have been obtained from the library archives of these respective organizations.

### 1.3.3. Unpublished reports.

This type of report was not submitted to the DTIC archive by the originating agency and was obtained from the local files of that organization. These reports are primarily from HEL, ARI, and ARL-HRED file archives and may be either full MANPRINT Assessments covering all 7 of the MANPRINT domains or they may cover only one domain such as human factors or safety. Many of these reports contain no distribution instructions. Requests for copies of these reports can be made to the Director ARL-HRED.

## 1.4. Report availability.

Most of the documents listed in this bibliography can be obtained from multiple sources. All documents with a DTIC control number can be obtained directly from NTIS either as a PDF document that can be downloaded directly, or in hardcopy form for a processing fee. All of the unpublished reports listed in this bibliography can be obtained from ARL-HRED subject to the approval of that agency.

## 1.5. How To Use This Bibliography.

This report is designed to facilitate both manual use and automated searches of computer databases.

### 1.5.1. Using the electronic version of the bibliography.

This report is structured so that it can be effectively used in its hardcopy format but it is designed for optimal use in electronic format. Attached to the back cover of Volume I of the hardcopy

version of the report is a CD containing all 3 volumes of the bibliography in a single PDF file. This PDF file supports electronic searches to quickly locate a desired study report regardless of how much or how little information is known about the report's date, title, system short or long name, or report type.

In addition, the CD contains a complete library of all known MANPRINT related reference documents and all the regulations, pamphlets, directives, and publications that could be identified as being MANPRINT related. This CD is included with the bibliography to provide the reader with a complete reference of MANPRINT reference materials in addition to the electronic copy of the bibliography. All of the documents in the CD are in full text PDF format.

#### 1.5.2. Using the hardcopy version of the bibliography.

If the PDF version of the bibliography is not available then the reference listings in Volume I can be used to support a manual search for the desired system report(s). The listings in sections 2 and 3 support this type of manual reference search. If all of the reports conducted during a certain year are of interest then the tables in paragraph 2.1 can be used. If only the short name of the system is known then the paragraph 2.2 tables can be used. Paragraph 2.3's tables list all of the reports in order by system short name categorized by system type. Paragraph 2.4's tables list all of the reports in order by the system long name. Finally, if it is desired to find all of the reports from a particular author or investigator then paragraph 3 can be used which lists all of the reports in order by the first author or principal investigator in a standard bibliographic reference format.

The annotated bibliographies for all the reports identified by this publication are in Volume II and Volume III. Volume II contains the annotated references for all of the MANPRINT Assessments developed for the DA G1 for MANPRINT. It is preceded by a one line listing for only these reports in order by System Short Name Categorized, System Short Name, System Long Name, and Year of the report. The annotated bibliography then follows in the same order in the format shown in the Table below.

Volume III contains the annotated references for all of the MANPRINT Assessments developed by the Test & Evaluation community. It is preceded by a one line listing for only these reports in order by System Short Name Categorized, System Short Name, System Long Name, and Year of the report. The annotated bibliography then follows in the same order in the format shown in the Table below.

If the reader is unable to find the report of interest using these tables, they are then referred to the index in Chapter 5 of Volume I which shows the page numbers from the total 3 volume bibliography for each system reported in the bibliography.

Table: Format of the Annotated Report Listings in this Bibliography

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**System Short Name:** *Type of Report, Short Name by Category of the System*

**Reference** (*Inline citation for the reference*):

Full reference of the reference in human factors reference format:

Author name- Last name first (year). Title of Study. Institution or agency performing study.  
Agency Report Number. DTIC report Number

**Key Words:**

Key words from the study for search purposes.

**System Description:**

A description of the system evaluated in the study

**Report Availability:**

Distribution restrictions or limitations of the report. For reports with no limitations this statement is:

Approved for Public Release; Distribution is Unlimited:

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### 1.5.3. Using the bibliography With Endnote™.

This document was prepared with Microsoft Word™ 2007 and the bibliographic database program Endnote™<sup>1</sup>, version X1. Once the information for each MANPRINT report was entered into the Endnote™ database, extracting it in a variety of formats was straightforward and was used to generate all of the lists and abstracts in the report. Endnote™ also supports an extensive database search capability which can be used to find reports for the various systems listed in this bibliography. One feature of Endnote™ is that full text PDF versions of the cited reports can be embedded into the database so that Endnote™ not only supports finding information about a MANPRINT report but can also provide a copy of the report itself. This bibliography is supported by a complete Endnote™ bibliography that has had all of the MANPRINT reports inserted into it. Thus, future researchers using Endnote™ version X1 or later can access the database to not only find out whether a particular system has been evaluated by a MANPRINT study in the past, but also to extract the study itself for reference while embarking on a new version of that system or a new system that is similar to a previous one.

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<sup>1</sup> EndNote. (2008). Endnote, Windows Version X1. Berkeley, CA.: ISI ResearchSoft, Inc.

Copies of the Endnote™ version of the MANPRINT bibliography that contains a PDF version of the report, the Endnote™ library, and all of the full documents cited in the bibliography in PDF format can be obtained by MANPRINT practioners from U.S. government agencies with a request to the Director, Human Research and Engineering Directorate, U.S. Army Research Laboratory, Aberdeen Proving Ground, Maryland 21001.

#### 1.6. Significance of this Bibliography.

One might reasonably question the significance of a MANPRINT study conducted in 1953 to any current system being evaluated. The earliest MANPRINT report in this bibliography is of the T42 tank that was conducted that year. The T42 tank did not even go into production, however, many of the crewstation concerns and findings from that report are valid for any tank design. Thus, any principal investigator initiating a study on a future tank design would certainly have an interest in becoming familiar with human related issues previously identified in earlier tank designs to ensure that they are not repeated in the new design. For this reason, all U.S. Army MANPRINT reports and studies that were found in any archive or file have been included in this bibliography.

#### 1.7. Distribution Restrictions for this Bibliography.

This document has no distribution restrictions and is authorized for public release. It is noted that many of the reports cited in this bibliography do have restrictions on their distribution to U.S. Government agencies, DOD and their contractors, and several are classified at the confidential and secret level. However, none of the findings or procedures in any of the study reports are included in this bibliography which only contains the name of the system that was evaluated, key words related to the system, year of the evaluation, and a description of that system along with the name of the principle investigator who conducted the study. There is, therefore, no restricted information in this bibliography and there are no limits on its distribution.

## **2. Cross Reference Listings of The Reports in This Bibliography.**

This section is designed to facilitate locating the annotated bibliographic reference for the system of interest and contains listings of the reports in the bibliography that can be used to determine if a study has been performed for the system of interest or one similar to it. For example, if a MANPRINT principal investigator is desiring to determine if any type of MANPRINT analysis has been performed for a certain system in the past they would be interested in finding a copy of that previous work to learn of prior problems and recommended solutions that had been previously identified. If the electronic version of this bibliography is available then an electronic search of the PDF files can quickly determine if the system had been previously studied and then see the full annotated listing for that study containing the names of all the authors, a description of the system, distribution restrictions, if any, for the system, and sources to obtain a copy of the report.

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**An Annotated Bibliography of MANPRINT Related Assessments and  
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**Volume III- Test & Evaluation Reports**

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8 December 2009

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## **11. Introduction.**

The reports in this section are assessments by the test and evaluation community of system performance. Although during the course of a system evaluation there are numerous reports that are generated ranging from event design plans, test data reports, and final system evaluations, the lists in this bibliography only document those reports of the final system evaluations. These final reports generally contain evaluations of one or more of the MANPRINT domains. Some reports have a section titled MANPRINT that almost always only includes the MANPRINT domain of HFE. Other sections of the report may address other domains such as SSv or SS.

The naming protocols of these reports have taken varying formats over the years but generally fall into 2 categories. Before 2008 the final T&E system reports were either titled a system assessment (SA) or a system evaluation report (SER). In April of 2008 ATEC published its Interim Policy Guidance memorandum, IPG 08-1<sup>5</sup>, which changed the naming conventions for its series of final T&E reports. These reports now became based on the concept of an Operational Test Agency (OTA). The new ATEC document names for final system reports are:

(1) OTA Assessment Report (OAR) is used to document the capabilities, limitations, and progress of the acquisition program in meeting its requirements based on test results. An OAR will not be used for reporting acquisition program effectiveness, suitability, and survivability to DOT&E for an acquisition decision. It replaces the SA.

(2) OTA Milestone “x” Assessment Report (OMAR) is used to document the acquisition program’s risk and progress towards meeting effectiveness, suitability, and survivability. It replaces the MS A SER, the MS B SER, and the MS C SER (unless MS C is for an FRP decision, in which case an OTA Evaluation Report will be used instead).

(3) OTA Evaluation Report (OER) is used to document the acquisition program’s demonstration of its effectiveness, suitability, and survivability. It replaces the FRP SER.

(4) OTA Follow-on Evaluation Report (OFER) is used to document the acquisition program’s risk and progress towards meeting effectiveness, suitability, and survivability criteria beyond FRP. It replaces both the SA and SER.

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<sup>5</sup> ATEC. (2008). ATEC Interim Policy Guidance: U.S. Army Test and Evaluation Command (ATEC) Interim Policy Guidance (IPG) 08-1, Test and Evaluation Document Name Changes. 4 April 2008. U.S. Army Test and Evaluation Command. Alexandria, VA.

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## 12. Listing of Volume III Reports In Order by Short Name- Long Name- Year.

This section contains an index of systems and terms in this section for reference when being read in hardcopy form.

<b>Test &amp; Evaluation Reports Ordered by Short Name Categorized- Short Name- Long Name- Year</b>			
<b>Short Name Categorized</b>	<b>Short Name</b>	<b>Long Name</b>	<b>Year</b>
ABCS- AFATDS	AFATDS	Addendum to the Advanced Field Artillery Tactical Data System (AFATDS) 99	2002
ABCS- AMDWS FAAD C2I	AMDWS FAAD C2I	Forward Area Air Defense Command, Control, and Intelligence (FAAD C2I) System Block III Version 5.4A-7.2 (v5.4A) Software	2008
ABCS- ASAS CP-SS	ASAS CP-SS	All Source Analysis System (ASAS) Capability Package-Single Source Limited User Test	1997
ABCS- BCS3	BCS3	Battle Command Sustainment Support System (BCS3)	2007
ABCS- CPOF	CPOF	Command Post of the Future (CPOF) / Abbreviated (ASER)	2005
ABCS- CPOF ver. 2.4	CPOF ver. 2.4	Command Post of the Future (CPoF) Version 2.4	2005
ABCS- CPOF ver. 3.0.2	CPOF ver. 3.0.2	Command Post of the Future (CPoF) Version 3.0.2	2006
ABCS- DTSS	DTSS	Digital Topographic Support System-Heavy (DTSS-H) AN/TYQ-48A1 Material Release Decision	1999
ABCS- DTSS-D	DTSS-D	Digital Topographic Support System - Deployable (DTSS-D)	2002
ABCS- DTSS-HVMP	DTSS-HVMP	Digital Topographic Support System - High Volume Map Production (DTSS-HVMP)	2003
ABCS- DTSS-L	DTSS-L	Digital Topographic Support System - Light AN/TYQ-67(V2)	2002
ABCS- DTSS-QRMP	DTSS-QRMP	Digital Topographic Support System/Quick Response Multicolor Printer (DTSS/QRMP) in the Lightweight Multipurpose Shelter (LMS) AN/TYQ-67(V)1 Product	1997
ABCS- FBCB2	FBCB2	Force XXI Battle Command Brigade and Below (FBCB2)	2001
ABCS- FBCB2/BFT	FBCB2/BFT	Force XXI Battle Command Brigade and Below/Blue Force Tracking (FBCB2/BFT) (U)	2004
ABCS- GCCS-A	GCCS-A	Global Combat Support System - Army (GCSS-Army) (GCSS-A)	2006
ABCS- GCSS-A	GCSS-A	Global Combat Support System-Army (GCSS-Army)	2006
ABCS- ISYSCON	ISYSCON	Integrated System (ISYSCON)	1999
ABCS- ISYSCON	ISYSCON	Integrated System Control (ISYSCON)	2000
ABCS- ISYSCON	ISYSCON	Integrated System Control (ISYSCON) (V)1/(V)2 Block 3 Software Increment 2.0	2004
ABCS- JNTC/CPOF	JNTC/CPOF	Joint Network Transport Capability (JNTC) (Including the Command Post of the Future (CPOF))	2005
ABCS- MCS	MCS	Maneuver Control System (MCS) RCS ATTE-3 Evaluation, July 1984	1984
ABCS- MCS	MCS	Maneuver Control System (MCS) RCS ATTE-3 Evaluation, November 1984	1984
ABCS- MCS	MCS	Maneuver Control System (MCS) RCS ATTE-3 FDTE	1983
ABCS- MCS ver 6.3.2	MCS ver 6.3.2	Maneuver Control system (MCS) Software Version 6.3.2	2003

<b>Test &amp; Evaluation Reports Ordered by Short Name Categorized- Short Name- Long Name- Year</b>			
<b>Short Name Categorized</b>	<b>Short Name</b>	<b>Long Name</b>	<b>Year</b>
ABCS- NOC-V	NOC-V	Network Operation Center - Vehicle (NOC-V)	2005
ABCS- NOC-V	NOC-V	Network Operation Center - Vehicle (NOC-V)	2006
ABCS- SECOMP-I	SECOMP-I	Secure Enroute Communications Package-Improved (SECOMP-I)	2006
ABCS- SWLAN	SWLAN	Secure Wireless Local Area Network (SWLAN)	2005
ADV FSC	ADV FSC	Advanced Food Sanitation Center (ADV FSC) (Milestone I/II Decision)	2001
Aircraft- ATIRCM-CMWS	ATIRCM-CMWS	Common Missile Warning System (CMWS) (U)	2006
Aircraft- ATIRCM-CMWS	ATIRCM-CMWS	Common Missile Warning System/Advanced Infrared Countermeasures Munitions (CMWS/AIRCMM)	2002
Aircraft- Fixed Wing- Cargo- C17 DRAS	C17 DRAS	C-17 Dual Row Airdrop System (DRAS)	2002
Aircraft- Fixed Wing- Cargo- JCA C-27	JCA C-27	Joint Cargo Aircraft (JCA)	2007
Aircraft- Fixed Wing- Intel- PROPHET	PROPHET	PROPHET Block II/III Acquisition Milestone (Phase B)	2002
Aircraft- Fixed Wing- Intel- PROPHET Ground	PROPHET Ground	Prophet Ground. Block 1	2001
Aircraft- Helicopter- Aircrew- AW	AW	Air Warrior Block 1	2003
Aircraft- Helicopter- Aircrew- AW EDM	AW EDM	Electronic Data Manager (EDM) Technical Insertion for Air Warrior (AW) (FILED WITH DB43447937)	2005
Aircraft- Helicopter- Aircrew- Cooling- MCS	Cooling-MCS	Microclimatic Cooling System (MCS)	2002
Aircraft- Helicopter- Aircrew- Ensemble- FREE	Ensemble-FREE	Fire Resistant Environmental Ensemble (FREE) System Integrator - ADS	2008
Aircraft- Helicopter- Aircrew- Knife- ASEK	Knife-ASEK	Aircrew Survival Egress Knife (ASEK)	2003
Aircraft- Helicopter- Aircrew- LaSER-	LaSER	Aircrew Laser Pointer (ALP)	2008
Aircraft- Helicopter- Attack- Apache Longbow AH-64D	Apache Longbow AH-64D	Longbow Apache (AH-64D) Transportability Demonstration	1998
Aircraft- Helicopter- Attack- Apache Longbow AH-64D Block III	Apache Longbow AH-64D Block III	Apache Block III	2006
Aircraft- Helicopter- Attack- Apache Longbow AH-64D LBHMMS	Apache Longbow AH-64D LBHMMS	Longbow HELLFIRE Modular Missile System (LBHMMS) Pre-Planned Product Improvement (P3I) Program Home-on-Jam/Anti-Jam (HOJ/AJ) Software	2005
Aircraft- Helicopter- Cargo- CH47F	CH47F	CH47F Cargo Helicopter	2007
Aircraft- Helicopter- Cargo- CH47F	CH47F	Helicopter, Cargo CH47F	2004
Aircraft- Helicopter- Cargo- MH-47E- Engine- 714A	MH-47E-Engine- 714A	714A Engine	1999
Aircraft- Helicopter- Recon- Comanche RAH66	Comanche RAH66	Reconnaissance and Attack Helicopter (RAH66) Comanche	2000
Aircraft- Helicopter- Utility- Blackhawk UH60L RECAP	Blackhawk UH60L RECAP	Recapitalization of the UH-60 Black Hawk Utility Helicopter Fleet	2000
Aircraft- Helicopter- Utility- Blackhawk UH60M	Blackhawk UH60M	UH60M Black Hawk Utility Helicopter	2005
Aircraft- Helicopter- Utility- Blackhawk UH60M	Blackhawk UH60M	UH60M Black Hawk Utility Helicopter	2007

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Aircraft- Helicopter- Utility- Blackhawk UH60M	Blackhawk UH60M	UH60M Upgrade Black Hawk Utility Helicopter	2009
Aircraft- Helicopter- Utility- Blackhawk UH60Q Medical	Blackhawk UH60Q Medical	UH60Q Medical Evacuation Helicopter	1999
Aircraft- Helicopter- Utility- LUH- Lakota UH72A	Lakota UH72A	Helicopter, Utility, Light UH-145 / UH72A	2006
Aircraft- Helicopter- Utility- LUH- Lakota UH72A	Lakota UH72A	UH72A Lakota Light Utility Helicopter	2007
Aircraft- Unmanned- UAV- TUAV Shadow	TUAV Shadow	Tactical Unmanned Aerial Vehicle (TUAV)	2002
Aircraft- Unmanned- UAV- TUAV Shadow	TUAV Shadow	Tactical Unmanned Aerial Vehicle (TUAV). Volume 2. Survivability	2002
AKMS-SKL	AKMS-SKL	Simple Key Loader (SKL) of Army Key Management System (AKMS)	2005
Artillery- 105mm- Computer- GLPS	GLPS	Gun Layering and Positioning System (GLPS)	1999
Artillery- 155mm- Charge- MACS XM231	MACS XM231	Modular Artillery Charge System (MACS) XM231	1999
Artillery- 155mm- Charge- MACS XM232	MACS XM232	Modular Artillery Charge System (MACS) XM232	2001
Artillery- 155mm- Computer- TADS	TADS	M777A2 LW155 Towed Artillery Digitization System (TADS) / Abbreviated (ASER)	2007
Artillery- 155mm- Fuze- M767	M767	Fuze, Electronic Time (ET), M767	1999
Artillery- 155mm- Fuze- MOFA	MOFA	XM782 Multi-Option Fuze for Artillery (MOFA)	1999
Artillery- 155mm- Fuze- PDDL Y	PDDL Y	Fuze, PD/Delay (PDDL Y), MK399 MOD 1 Materiel Release	2001
Artillery- 155mm- Projectile- RADAM	RADAM	Remote Area Denial Artillery Munition (RADAM)	2000
Artillery- 155mm- Projectile- SADARM	SADARM	Sense and Destroy Armor Munition (SADARM)	1998
ASLMS	ASLMS	Authorized Stockage List Mobility System (ASLMS)	2004
ASWDS	ASWDS	Airborne Scraper and Water Distribution System (ASWDS) Type Classification - Generic Decision	2001
ATLAS II	ATLAS II	All-Terrain Lifter, Army System (ATLAS) II / Abbreviated (ASER)	2005
AVCATT-A	AVCATT-A	Aviation Combined Arms Tactical Trainer - Aviation Reconfigurable Manned Simulator (AVCATT-A)	2003
BASIC P3I	BASIC P3I	Body Armor Set, Individual Countermine Preplanned Product Improvement (BASIC P3I) (Full Rate Production Decision and Update to Type Classification System Evaluation Report)	2001
BASIC-P3I	BASIC-P3I	Body Armor Set, Individual Countermine, Preplanned Product Improvement (BASIC P3I)	2000
BCIS	BCIS	Battlefield Combat Identification System (BCIS)	2002
BNBFBSBSG	BNBFBSBSG	Ballistic/Non-Ballistic Face and Body Shields, and Ballistic Shin Guards (BNBFBSBSG)	1998
Boat- Barge- BD	BD	115-Ton Barge Derrick (BD), 6800-Class	1998
Boat- Tug- ST	ST	60-Foot Small Tug (ST), 900-Class	1999
Body Armor- CBA-Plus	CBA-Plus	Concealable Ballistic Armor-Plus (CBA-Plus)	2003

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Body Armor- Interceptor Body Armor- IBA	Interceptor Body Armor-IBA	Interceptor Body Armor (IBA)	1999
Body Armor- Interceptor Body Armor- IBA	Interceptor Body Armor-IBA	Interceptor Body Armor (IBA)	1999
BVTC	BVTC	Battlefield Video Teleconference (BVTC) System	2002
CABS	CABS	Cockpit Air Bag Systems (CABS)	2001
CALSET 2000	CALSET 2000	Calibration Set 2000 (CALSET 2000)	2001
Cannon- 105mm- Cartridge- APC Canister M1040	APC Canister M1040	Cartridge, 105MM Canister, Anti-Personnel, M1040	2006
Cannon- 105mm- Cartridge- APC Canister M1040	APC Canister M1040	Cartridge, 105mm, Canister, M1040	2007
Cannon- 105mm- Cartridge- APC Canister XM1040	APC Canister XM1040	XM1040 105mm Anti-Personnel Canister Cartridge	2005
Cannon- 105mm- Cartridge- HE M393A3	HE M393A3	M393A3 105mm High Explosive Cartridge and the M467A1 105mm Target Practice Cartridge	2005
Cannon- 25mm- Cartridge- APFSDS-T M919	APFSDS-T M919	25mm, Armor-Piercing Fin Stabilized Discarding Sabot-Tracer (APFSDS-T), M919 Cartridge With Swiss Munitions Extruded/Impregnated (EI)-Propellant	2000
Cannon- 25mm- Cartridge- APFSDS-T M919 (rev)	APFSDS-T M919 (rev)	25mm, Armor-Piercing Fin Stabilized Discarding Sabot-Tracer (APFSDS-T), M919 Cartridge With Swiss Munitions Extruded/Impregnated (EI)-Propellant (Revised)	2000
Cannon- Cartridge- 120mm- APFSDS-T M829A3	APFSDS-T M829A3	on the Cartridge, 120mm, Armor Piercing, Fin Stabilized, Discarding Sabot, with Tracer (APFSDS-T), M829A3	2005
Cannon- Cartridge- 120mm- APFSDS-T M829E3	APFSDS-T M829E3	Cartridge, 120mm Armored Piercing, Fin Stabilized, Discarding Sabot, with Tracer (APFSDS-T), M829E3 (U)	2003
Cannon- Cartridge- 120mm- APFSDS-T M829E3	APFSDS-T M829E3	Cartridge, 120mm, Armor Piercing, Fin Stabilized, Discarding Sabot, with Tracer (APFSDS-T), M829E3, Full-Rate Production - Type Classification Standard	2003
Cannon- Cartridge- 120mm- APFSDS-T M829E3	APFSDS-T M829E3	Live Fire Lethality Test for Cartridge: 120mm APFSDS-T, M829E3 (U)	2002
Cannon- Cartridge- 120mm- Canister M1028	Canister M1028	Cartridge,120mm: Canister, M1028	2006
Cannon- Cartridge- 120mm- Canister M1028	Canister M1028	Full-Rate Production/Type Classification - Standard Decision for the M1028 120mm Canister Cartridge	2005
Cannon- Cartridge- 120mm- Canister XM1028	Canister XM1028	XM1028 120mm Canister Cartridge	2005
Cannon- Cartridge- 120mm- HE-OR-T	HE-OR-T	Cartridge 120mm High Explosive-Obstacle Reduction (HE-OR-T) XM908	2002
Cannon- Cartridge- 120mm- TPMP-T M1002	TPMP-T M1002	Cartridge, 120mm, Target Practice Multi-Purpose with Tracer (TPMP-T), M1002. System Evaluation Report Produced in Support of Type Classification - Standard and Full Rate Production Decisions	2006
Cannon- Cartridge- 120mm- TPMP-T M1002	TPMP-T M1002	Cartridge, 120mm, Target Practice Multi-Purpose with Tracer, M1002	2007
Cannon- Cartridge- 120mm- TPMP-T XM1002	TPMP-T XM1002	XM1002 120mm Target Practice Multi-Purpose with Tracer (TPMP-T) Cartridge	2005
CCTT	CCTT	Close Combat Tactical Trainer (CCTT)	2000

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CCTT	CCTT	Close Combat Tactical Trainer (CCTT) Primary 1 (P1) Temperate Database	2002
CHCS	CHCS	Composite Health Care System (CHCS) II, Block 2	2005
Computer- AIS- RCAS	RCAS	Reserve Component Automation System (RCAS) Increment 4/5	2001
Computer- AIS- RCAS	RCAS	Reserve Component Automation System (RCAS) Increment 8	2003
Computer- Client/Server- CMIS	CMIS	Configuration Management Information System (CMIS) Version (V.)5.1.3.1	1998
Computer- JCALS	JCALs	Joint Computer-Aided Acquisition and Logistics Support (JCALS) for SWP 3.1	2002
Computer- Simulation- Models- MATH	Simulation- Models-Math	Combined Site Acceptance Test (SAT) and Operational Test and Evaluation (OT&E) of the Math Models (Wholesale) Version 1.0	1998
Computer- Test- NGATS	NGATS	Next Generation Automation Test System (NGATS) Version 6	2009
Computer- Test- SPORT	SPORT	Soldier's Portable On-System Repair Tool	1998
CROWS XM101	CROWS XM101	Common Remotely Operated Weapon Station (CROWS) Milestone (MS) B	2004
CS	CS	Containerized Shower (CS)	1999
CSPBA	CSPBA	Concealable Stab Protective Body Armor (CSPBA)	2002
DCGS-A	DCGS-A	Distributed Common Ground System - Army (DCGS-A). Version 3.0	2008
DMS-A	DMS-A	Defense Messaging System - Army Extension into the Tactical Environment (DMS-A)	2004
DMS-A	DMS-A	Defense Messaging System-Army Extension into the Tactical Environment (DMS-A)	2003
DSB	DSB	Dry Support Bridge (DSB)	2003
DTS 1.7.0.2	DTS 1.7.0.2	Defense Travel System (DTS) Monroe Release v1.7.0.2	2006
DTS 1.7.1.5	DTS 1.7.1.5	Defense Travel System (DTS) Monroe Release v1.7.1.5	2007
DTS CBA v.3	DTS CBA v.3	Defense Travel System (DTS) Centrally Billed Account (CBA) Reconciliation Module Version 3	2005
DTS Madison	DTS Madison	Defense Travel System (DTS) Madison Release	2005
DTS Madison 1.6a	DTS Madison 1.6a	Defense Travel System (DTS) Madison Release A (v.1.6a)	2005
ECDS	ECDS	Enhanced Containerized Delivery System (ECDS) / Abbreviated (ASER)	2006
ENVG	ENVG	Enhanced Night Vision Goggle (ENVG) / Abbreviated (ASER)	2005
ENVG	ENVG	Enhanced Night Vision Goggle (ENVG) AN/PSQ-20 (ACAT III)	2007
Explosives- Bangalore BTDK	Bangalore BTDK	2.5-Foot Bangalore Torpedo (BTDK)	2005
Explosives- Blasting Cap- M16	Blasting Cap M16	M16 Blasting Cap	2001
Explosives- HE-WAM	HE-WAM	Hand Emplaced - Wide Area Munition (HE-WAM)	2000
Explosives- IMS- FCS	IMS FCS	Intelligent Munition System (IMS) Increment 1 Milestone B	2005
Explosives- MCCM	MCCM	Modular Crowd Control Munition (MCCM)	1998

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Explosives- MCCM	MCCM	Modular Crowd Control Munition (MCCM)	1999
Explosives- MDI	MDI	Modernized Demolition Initiator (MDI), M18	2001
Explosives- MDI	MDI	Modernized Demolition Initiators (MDI) XM151, XM152 Boosters and XM152 Inert Booster Milestone III	2000
Explosives- MDI	MDI	XM19/21/23 Modernized Demolition Initiators (MDI)	2002
Explosives- MDI Booster	MDI Booster	Modernized Demolition Initiators (MDI) M151 & M152 Boosters and M152 Inert Boosters	2001
Explosives- RAMS	RAMS	Remote Activation Munition System (RAMS) (Material Release)	1999
Explosives- RAMS	RAMS	Remote Activation Munition System (RAMS) M17 Receiver and AM85 Trainer Materiel Release	2004
Explosives- RAMS	RAMS	Remote Activation Munition System (RAMS) XM17 Receiver Milestone III	2001
Explosives- RAMS MI	RAMS MI	Firing Device, Demolition: Magneto-Inductive Remote Activation Munition System (MI-RAMS), M156 (M27 Transmitter and M39 Type A Receiver), Milestone C. TC-Standard/Full-Rate Productions and Full Materiel Release Decision	2008
Explosives- RAMS MI	RAMS MI	Magneto-Inductive Remote Activation Munition System (MI RAMS)	2003
Explosives- SDK	SDK	Special Operations Forces (SOF) Demolition Kit Large (SDK) Explosively Formed Penetrator	2000
Explosives- SDK- FP-EFP	SDK FP-EFP	Special Operations Forces Demolition Kit (SDK) Fence Piercing-Explosively Formed Penetrator (FP-EFP)	2006
Explosives- SDK M303	SDK M303	M303 Special Operations Forces Demolition Kit (SDK) Full Materiel Release	1999
Explosives- SDK- MEFP-CC	SDK MEFP-CC	Special Operations Forces Demolition Kit (SDK) Multi-Faceted Explosively Formed Penetrator (MEFP) and Cable Cutter (CC)	2004
Explosives- SDK- MEFP-CCs	SDK MEFP-CCs	Special Operations Forces Demolition Kit (SDK) Multi-Faceted Explosively Formed Penetrator (MEFP), Small and Large Cable Cutters (CCs), and Large Cable Cutters (CCs), and Medium and Large Linear Shaped Charges (LSC)	2005
Explosives- SLAM	SLAM	M4, Selectable Lightweight Attack Munition (SLAM)	2001
Explosives- SLAM	SLAM	Munition, Selectable Lightweight Attack (SLAM): M4E1 and SLAM Improved Functional Trainer (SIFT): M320E1	2008
Explosives- TD-SYDET	TD-SYDET	XM153 Time Delay/Sympathetic Detonator (TD-SYDET) and XM316 Trainer	2005
Explosives- TD-SYDET	TD-SYDET	XM153 Time/Delay/Sympathetic Detonator (TD/SYDET) and XM316 Trainer	2001
FBN	FBN	Family of Batons and Nightsticks (FBN)	2002
Fire Fighter- Glove- J-FIRE	J-FIRE	Joint Firefighter Integrated Response Ensemble (J-FIRE) Glove	2000
FIS-C	FIS-C	Firefighters Integrated Suit - Combat (FIS-C) (Type Classification - Standard Decision).	1998
FOL	FOL	Manpack Version of the Family of Loudspeakers (FOL)	1999

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FRS	FRS	Forward Repair System (FRS)	2000
GBS-TIP/TGRS	GBS-TIP/TGRS	Global Broadcast Service Transportable Ground Receive Suite and Theater Injection Point (GBS-TIP/TGRS)	2003
Generator- DPGDS MEP-PU-810B	DPGDS MEP-PU-810B	Deployable Power Generation and Distribution System (DPGDS) MEP-PU-810B	2002
Generator- TQG 100/200 KW	TQG 100/200 KW	100 kW and 200 kW Tactical Quiet Generator (TQG) Sets	1999
Generator- TQG 100/200 KW	TQG 100/200 KW	100 kW and 200 kW Tactical Quiet Generator (TQG) Sets	2004
Generator- TQG 30/60 KW	TQG 30/60 KW	Family of Tactical Quiet Generators (TQG) (30/60 KW)	2001
Generator- TQG- 3KW	TQG-3KW	3-Kilowatt Tactical Quiet Generator (3kW TQG)	2000
Grenade- Hand- LFHG XM96	LFHG XM96	XM96 Lightweight Fragmentation Hand Grenade (LFHG)	2001
Grenade- Hand- Stun SHG XM84	Stun SHG XM84	XM84 Stun Hand Grenade (SHG)	1998
Grenade Launcher- 40mm-Cartridge- ANLM XM1112	ANLM XM1112	40mm, XM1112 Airburst Non-Lethal Munition (ANLM)	2007
Grenade Launcher- 40mm-Cartridge- CC	CC	Cartridge, 40mm, Canister, M1001	2006
Grenade Launcher- 40mm-Cartridge- CC	CC	XM1001 40mm Canister Cartridge (CC)	2000
Grenade Launcher- 40mm-Cartridge- CDC	CDC	Non-Lethal 40mm Crowd Dispersal Cartridge	1998
Grenade Launcher- 40mm-Cartridge- CDC	CDC	XM 1029 40mm Crowd Dispersal Cartridge (CDC)	2001
Grenade Launcher- 40mm-Cartridge- Machinegun- Practice MK281	MK281 40mm Practice Cartridge	MK281 MOD 0 40mm Practice Cartridge	2004
Grenade Launcher- 40mm-Cartridge- NLC XM1006	NLC XM1006	XM1006 40mm Non-Lethal Cartridge	1999
Grenade Launcher- 40mm-Cartridge- NLC XM1006	NLC XM1006	XM1006 40mm Non-Lethal Cartridge	1999
Grenade Launcher- 40mm-Cartridge- NLC-CS	NLC-CS	12 Gauge and 40mm Nonlethal Ammunition for Contingency Stockpile	2000
Grenade Launcher- 40mm- GLM XM320	GLM XM320	XM320 Grenade Launcher Module (GLM)	2007
Grenade Launcher- 40mm-Machine Gun Mount- MK64	Machine Gun Mount-MK64	MK64 MOD 9 Machine Gun Mount for the 40mm MK19 Machine Gun	1997
Grenade Launcher- Cartridge- 66mm- Blunt Trauma Distraction XM98/XM99	Blunt Trauma Distraction XM98/XM99	66mm Non-Lethal Grenades: XM98 Distraction/XM99 Blunt Trauma	2001
Grenade Launcher- Cartridge- 66mm- Blunt Trauma Distraction XM98/XM99	Blunt Trauma Distraction XM98/XM99	66mm XM98 Distraction and XM99 Blunt Trauma Grenades/Cartridges	1999
Grenade Launcher- Cartridge- 66mm- CS L96A1	CS L96A1	Grenade, Discharger: Anti-Riot, Irritant, CS, L96A1 and Grenade, Discharger: Anti-Riot, Practice, L97A1	2001
GSTAMIDS	GSTAMIDS	Ground Standoff Minefield Detection System (GSTAMIDS) -Vehicle-Mounted Mine Detector (VMMD)	1998
GSTAMIDS	GSTAMIDS	Ground Standoff Minefield Detection System, Future Combat Systems (GSTAMIDS-FCS)	2003

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Heater- SHA	SHA	Space Heater Arctic (SHA) (Material Release)	1999
Heater- SHC-60K	SHC-60K	Space Heater Convective (SHC) 60,000 British Thermal Unit (60K BTU) (SHC-60K)	2005
Heater- SHS	SHS	Space Heater Small (SHS)	2001
Helmet- MICH	MICH	Modular Integrated Communications Helmet (MICH)	2001
HENLM	HENLM	Hand Emplaced Non-Lethal Munition (HENLM)	2005
HSTAMIDS	HSTAMIDS	AN/PSS-14, Handheld Standoff Mine Detection System (HSTAMIDS)	2003
HSTAMIDS	HSTAMIDS	Handheld Standoff Mine Detection System (HSTAMIDS)	2000
I-FLIR	I-FLIR	Improved-Forward Looking Infrared (I-FLIR)	2000
INE	INE	Sectera KG-235 Inline Network Encryptor (INE)	2004
IRB	IRB	Improved Ribbon Bridge (IRB)	2003
IVMMD-STs	IVMMD-STs	Interim Vehicle-Mounted Mine Detector Standard Teleoperation System (IVMMD-STs)	2001
IVMMD-STs Meerkat	IVMMD-STs Meerkat	Interim Vehicle-Mounted Mine Detector Standard Teleoperation System (IVMMD-STs)	2001
JBSDS	JBSDS	Joint Biological Standoff Detection System (JBSDS) Block I	2003
JLCCTC	JLCCTC	Joint Land Component Constructive Training Capability (JLCCTC) Version 3.0	2006
JNMS	JNMS	Joint Network Management System (JNMS)	2004
JTIDS	JTIDS	Joint Tactical Information Distribution System (JTIDS)	1997
LaSER-	LaSER-	Lightweight Laser Designator Rangefinder (LLDR)	2001
LaSER-	LaSER-	Multiple Laser Engagement System (MILES) 2000	2002
Laundry- CBL	CBL	Full-Rate Production (FRP) Decision for the Containerized Batch Laundry (CBL) / Abbreviated (ASER)	2004
Laundry- CSSL	CSSL	Containerized Self-Service Laundry (CSSL)	2000
Laundry- LADS	LADS	Laundry Advanced System (LADS)	1999
LESD	LESD	Launched Electrode Stun Device (LESD) / Abbreviated (OER-A)	2008
LOCB	LOCB	Line of Communications Bridge (LOCB)	2009
LRAS3	LRAS3	Configuration of Corrective Actions to the Far Target Location Function of the Long Range Advanced Scout Surveillance System (LRAS3)	2000
LRAS3	LRAS3	Long Range Advanced Scout Surveillance System (LRAS3)	1999
LRAS3 WM	LRAS3 WM	Continuous Evaluation of the Long Range Advanced Scout Surveillance System (LRAS3) for Confirmation of Corrective Actions to the Weapons Mounting (WM)	2001
LVOSS	LVOSS	Light Vehicle Obscuration Smoke System (LVOSS)	2000
LVRS-II	LVRS-II	Light Weight Video Reconnaissance System II (LVRS-II)	1998
LWGM	LWGM	XM192 Lightweight Ground Mount (LWGM)	2003

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MALS	MALS	Mobile Analytical Laboratory System. (MALS). Block 1	2001
MASH	MASH	Mobile Army Surgical Hospital TTOE 8-063T. (MASH) (U)	1979
MDARS-E	MDARS-E	Mobile Detection Assessment Response System (MDARS) - Exterior	2000
MDARS-I	MDARS-I	Mobile Detection Assessment Response System - Interior (MDARS-I)	1998
Medical- CEIS-NT	CEIS-NT	Corporate Executive Information System - Near Term (CEIS-NT) Version (V.) 0.3 Government Installation Acceptance Test (GIAT)	1997
MGPTS	MGPTS	Modular General Purpose Tent System (MGPTS)	1999
MIDS LVT	MIDS LVT	Multifunctional Information Distribution System - Low Volume Terminal (2) [MIDS LVT(2)]	2002
MILES AVCPS	MILES AVCPS	MILES 2000 Audio/Visual Cue Pyrotechnic Simulators	1998
Mine Detector- FOMD	FOMD	Family of Metal Detectors (FOMD)	2004
Missile- ABM- THAAD	THAAD	Terminal High Altitude Area Defense (THAAD)	2009
Missile- Air Defense- Avenger	Avenger	Forward Area Air Defense (FAAD) Line-of-Sight (LOS) Avenger [Slew-to-Cue (STC)]	1999
Missile- Air Defense- PATRIOT	PATRIOT	Patriot Post-Deployment Build (PDB-6) Limited User Test (LUT) (U)	2007
Missile- Air Defense- PATRIOT MEADS	PATRIOT MEADS	Patriot/Medium Extended Air Defense System (MEADS) Combined Aggregate Program (CAP)	2004
Missile- Air Defense- PATRIOT MEADS LSAC-M	PATRIOT MEADS LSAC-M	Design and Development Phase. Medium Extended Air Defense System (MEADS) XM1160 with the Low Signature Armored Cab (LSAC-M) Crew Survivability	2008
Missile- Antitank- JAVELIN	JAVELIN	Javelin Anti-Armor Weapon System	1997
Missile- Antitank- JAVELIN	JAVELIN	Javelin Anti-Armor Weapon System FRP I Hardware	1999
Missile- Antitank- JAVELIN	JAVELIN	Javelin Anti-Armor Weapon System Full-Rate Production 3 Missile with -079 and Reworked -039 CESAFA	2002
Missile- Antitank- JAVELIN	JAVELIN	Javelin Anti-Armor Weapon System Full-Rate Production I Missile	2000
Missile- Antitank- JAVELIN	JAVELIN	Javelin Anti-Armor Weapon System Full-Rate Production II Missile	2001
Missile- Antitank- JAVELIN	JAVELIN	Javelin Anti-Armor Weapon System Live Fire Test, Evaluation, and Lethality (U)	1997
Missile- Antitank- JAVELIN	JAVELIN	Javelin Antitank Weapon System (Block I) (U)	2007
Missile- Antitank- JAVELIN	JAVELIN	Javelin Reliability and Availability Maturity	2000
Missile- Antitank- JAVELIN EPP	JAVELIN EPP	Javelin Anti-Armor Weapon System LRIP III Configured Enhanced Producibility Program (EPP) Round	1998
Missile- Antitank- LOSAT	LOSAT	Line-of-Sight Antitank Weapon System (LOSAT) (U)	2005
Missile- Antitank- TOW 2B AERO GEN 1	TOW 2B AERO GEN 1	Retrofitted Tube-launched, Optically-tracked, Wire-guided (TOW) 2B Generation (GEN I)	2002

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Missile- Antitank- TOW 2B AERO GEN 2 CAPS	TOW 2B AERO GEN 2 CAPS	Tube-Launched, Optically Tracked, Wire-Guided (TOW) 2B Aerodynamic (AERO) Missile, and the Tow 2B Aero GEN2 Missile (Counter-Active Protection Systems (CAPS) Version)	2009
Missile- Antitank- TOW FF	TOW FF	TOW Fire and Forget (FF) System	2000
Missile- Antitank- TOW ITAS	TOW ITAS	Improved Target Acquisition System (ITAS)	1997
Missile- Antitank- TOW ITAS	TOW ITAS	Improved Target Acquisition system (ITAS)	1999
Missile- Antitank- TOW ITAS	TOW ITAS	Improved Target Acquisition System (ITAS)	1999
Missile- Antitank- TOW ITAS	TOW ITAS	Improved Target Acquisition System (ITAS) Customer Test	1998
Missile- Antitank- TOW ITAS CD	TOW ITAS CD	Improved Target Acquisition System (ITAS), Customer Demonstration (CD)	1998
Missile- TBM- ATACMS	ATACMS	Army Tactical Missile System (ATACMS) Block IA Missile (U)	1997
Missile- TBM- ATACMS Unitary M48	ATACMS Unitary M48	Army Tactical Missile System (ATACMS) Block 1A Quick Reaction Unitary, M48	2005
Missile- TBM- ATACMS-BAT	ATACMS-BAT	Army Tactical Missile System (ATACMS) Block II/Brilliant Antiarmor (BAT)	2002
Missile- TBM- ATACMS-BAT	ATACMS-BAT	Army Tactical Missile System (ATACMS) Block II/Brilliant Anti-Armor Submunition (BAT)	1998
Mortar- 120mm- Cartridge- FRPC M931	FRPC M931	120mm M931 Full Range Practice Cartridge (FRPC)	1998
Mortar- 120mm- Cartridge- ILL IR XM983	ILL IR XM983	120mm Infrared Illuminating Cartridge, XM983	2000
Mortar- 120mm- Cartridge- ILL XM930	ILL XM930	120mm Illuminating Cartridge, XM930	2000
Mortar- 120mm- Cartridge- IRILL M983	IRILL M983	120mm M983 Infrared Illumination (IRILL) Mortar Cartridge, Production Verification Test	2003
Mortar- 120mm- Cartridge- M933E1	M933E1	Mortar, 120mm, High Explosive Cartridge, M933E1	2007
Mortar- 120mm- Cartridge- M934A1	M934A1	120mm M934A1 High Explosive Cartridge	2001
Mortar- 120mm- Cartridge- M934A1E1	M934A1E1	120mm High Explosive Cartridge, M934A1E1. Production Qualification Test	2006
Mortar- 120mm- Cartridge- Stowage Kit	Stowage Kit	Stowage Kit: 120mm Mortar, XM326	2007
Mortar- 120mm- Cartridge- WP M929	WP M929	120mm M929 White Phosphorus (WP) Smoke Cartridge	1998
Mortar- 120mm- Cartridge- XM930 Illumination	XM930 Illumination	XM930 120mm Illumination Cartridge	2003
Mortar- 120mm/107mm/81mm/60mm- Computer- LHMBC XM32	LHMBC XM32	Lightweight Hand-Held Mortar Ballistic Computer (LHMBC)	2005
Mortar- 120mm/107mm/81mm/60mm- Computer- MBC M30	MBC M30	M30 Mortar Ballistic Computer	2000
Mortar- 60mm- Cartridge- FRPC XM769	FRPC XM769	XM769 60mm Full Range Practice Cartridge (FRPC)	2001
Mortar- 60mm- Cartridge- HE M720A1	HE M720A1	60mm High Explosive Cartridges, M720A1 and M768	2005

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Mortar- 60mm- Cartridge- IRILL M767	IRILL M767	60mm Infrared Illumination Cartridge, M767	2000
Mortar- 60mm- Cartridge- IRILL XM767	IRILL XM767	60mm Infrared Illuminating (IR- ILL) Cartridge, XM767	1999
Mortar- 60mm- Cartridge- MAPAM XM1061	MAPAM XM1061	60mm Mortar Anti-Personnel Anti-Materiel Production Qualification Test (MAPAM)	2006
Mortar- 60mm- Cartridge- SRTR M766	SRTR M766	60mm Short Range Training Round (SRTR)	1998
Mortar- 60mm- Cartridge- WP M722A1	WP M722A1	60mm M722A1 White Phosphorus (WP) Mortar Cartridge	2003
Mortar- 60mm- Fuze- PD/DLY M720E1	PD/DLY M720E1	M720E1 and XM768 60mm Insensitive Munition Cartridges and XM783 Point Detonating/Delay Fuze (PDDLY)	2001
Mortar- 81mm- Cartridge- HEMC M889A1E1	HEMC M889A1E1	Mortar, 81mm, High Explosive Mortar Cartridge (HEMC), M889A1E1	2007
Mortar- 81mm- Cartridge- IRILL XM816	IRILL XM816	M816 81mm Infrared Illumination Cartridge	2002
Mortar- 81mm- Cartridge- IRILL XM816	IRILL XM816	XM816 81mm Infrared Illumination Cartridge	2001
MPCV	MPCV	Mine Protected Clearance Vehicle (MPCV)	2002
MRCDD	MRCDD	XM37 Mid-Sized Riot Control Dispenser (MRCDD)	1999
MSDE	MSDE	Army's Role in Multi-Service Distributed Test Event (MSDE)	2006
M-TADS/PNVS	M-TADS/PNVS	Modernized Target Acquisition Designation Sight/Pilot's Night Vision Sensor (M-TADS/PNVS)	2005
MTS	MTS	Movement Tracking System (MTS) Block I	2001
NBC- Decon- MDS	MDS	Modular Decontamination System (MDS)	1999
NBC- Detector- ACADA	ACADA	Automatic Chemical Agent Detector Alarm (ACADA)	1998
NBC- Detector- BIDS P3I	BIDS P3I	Biological Integrated Detection System (BIDS) Preplanned Product Improvement (P3I)	2000
NBC- Detector- I-CAM	I-CAM	Improved Chemical Agent Monitor (I-CAM)	1998
NBC- Detector- JBPDS	JBPDS	Joint Biological Point Detection System (JBPDS) Limited User Test (LUT)	2008
NBC- Detector- JBSDS	JBSDS	Joint Biological Standoff Detection System (JBSDS) Block 1	2004
NBC- Detector- JBSDS	JBSDS	Joint Biological Standoff Detection System (JBSDS) Increment 1	2005
NBC- Detector- JBSDS	JBSDS	Joint Biological Standoff Detection System (JBSDS) Increment I	2009
NBC- Detector- JCBRAWM	JCBRAWM	Joint Chemical, Biological, Radiological Agent Water Monitor (JCBRAWM) Increment 1	2009
NBC- Detector- JSLSCAD	JSLSCAD	Joint Service Lightweight Standoff Chemical Agent Detector, Increment 1 (JSLSCAD Incr 1)	2006
NBC- Detector- MICAD	MICAD	Multipurpose Integrated Chemical Agent Alarm (MICAD)	1999
NBC- Detector- Sampler Kit M279	Sampler Kit M279	Sampler Kit, Air: Chemical Agent Alarm, M279 Surface Sampler Probe	2002
NBC- Gloves- JSLIST	JSLIST	Joint Service Lightweight Integrated Suit Technology (JSLIST) Block 1 Glove Upgrade / Abbreviated (ASER)	2004

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NBC- Mask- Protective- Aircrew- ACPM M45	ACPM M45	M45 Aircrew Protective Mask (ACPM)	1999
NBC- Mask- Protective- JSCESM	JSCESM	Joint Service Chemical Environment Survivability Mask (JSCESM)	2006
NBC- Mask- Protective- JSGPM	JSGPM	Joint Service General Purpose Mask (JSGPM)	2007
NBC- Shelter- CBPS	CBPS	Chemical Biological Protective Shelter (CBPS)	2001
NBC- Shelter- CBPS-DCS/FST	CBPS-DCS/FST	Chemical Biological Protective Shelter (CBPS) Division Clearing Station/Forward Surgical Team (DCS/FST)	2002
NBC- Suit- Glove- JSLIST	JSLIST	Joint Service Lightweight Integrated Suit Technology (JSLIST) Block 2 Glove Upgrade (JB2GU) Non-Flame Resistant (NFR) Variant	2007
NBC- Suit- ITAP	ITAP	Improved Toxicological Agent Protective (ITAP) Ensemble	1999
NBC- Suit- JSLIST-I	JSLIST-I	Joint Service Lightweight Integrated Suit Technology I (JSLIST I), Developmental and Operational Tests (DTs and OTs)	1997
NBC- Suit- STEPO	STEPO	Self-Contained Toxic Environment Protective Outfit (STEPO)	1997
NBC- Suit- STEPO	STEPO	Self-Contained Toxic Environment Protective Outfit (STEPO)	2001
NLCS	NLCS	Platoon Non-Lethal Capabilities Set (NLCS)	2006
OSCILLOSCOPE (OS-303	OSCILLOSCOPE (OS-303	OSCILLOSCOPE (OS-303()/G), MS I/III	2001
Parachute- ATPS	ATPS	Advanced Tactical Parachute System (ATPS) Milestone C - Type Classification	2009
Parachute- USL	USL	Universal Static Line (USL)	1998
PFED	PFED	AN/PSG-10, AN/PYG-3, and AN/PYG-4 Pocket-Sized Forward Entry Device (PFED) with Software Version 2.0 (SW V2.0)	2005
PFED	PFED	Pocket-Sized Forward Entry Device (PFED)	2004
PG	PG	Protective Glove (PG)	2001
Phoenix	Phoenix	Phoenix Multi-Band Super High Frequency (SHF) Satellite Terminal (Block 2 Phoenix)	2006
PLS-CHU	PLS-CHU	Palletized Load System - Container Handling Unit (PLS-CHU)	2000
PLS-CROP	PLS-CROP	Palletized Load System - Container Roll-In/Out Platform (PLS-CROP)	2000
PLS-E MTS	PLS-E MTS	Palletized Loading System - Enhanced (PLS-E) Movement Tracking System (MTS)	1999
Profiler-MMS-P	Profiler-MMS-P	Meteorological Measuring Set Profiler (MMS-P), AN/TMQ-52A	2007
Profiler-MMS-P	Profiler-MMS-P	Meteorological Measuring Set-Profiler (MMS-P) AN/TMQ-52	2005
PVAB	PVAB	Portable Vehicle Arresting Barrier (PVAB)	2000
PVIS	PVIS	Portable Vehicle Immobilization System (PVIS)	1998
Radar- ETRAC	ETRAC	Enhanced Target Range and Classification (ETRAC) Modified Sentinel Radar	2005
Radar- JSTARS-CGS	JSTARS-CGS	Joint Surveillance Target Attach Radar System (Joint Stars) (JSTARS) Common Ground Station (CGS)	1999

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Radar- JSTARS-CGS	JSTARS-CGS	Joint Surveillance Target Attack Radar System (Joint STARS) (JSTARS) Common Ground Station (CGS) and Joint Services Work Station (JSWS)	2002
Radar- JSTARS-CGS (Update)	JSTARS-CGS (Update)	Joint Surveillance Target Attack Radar System (Joint Stars) (JSTARS) Common Ground Station (CGS) (Update)	2000
Radar- Lynx II	Lynx II	Unmanned Aircraft System (UAS) Payloads Update (Lynx II)	2008
Radio- BSN	BSN	Brigade Subscriber Node (BSN)	2005
Radio- GBS TGRS	GBS TGRS	Global Transport Service (GBS) Transportable Ground Receive Suite (TGRS)	2005
Radio- Handheld- ICOM IC-F3 SI	ICOM IC-F3 SI	Soldier Intercom (SI)	1998
Radio- HF NOE COMM AN/ARC-220	HF NOE COMM AN/ARC-220	High Frequency, Nap-Of-The-Earth Communications (HF NOE COMM) System Consisting of the AN/ARC-220 and Advanced Narrowband Digital Voice Terminal (ANDVT) AIRTERM KY-100	1997
Radio- JTRS Cluster 5	JTRS Cluster 5	Joint Tactical Radio System - Cluster 5 (JTRS - Cluster 5)	2004
Radio- MBITR	MBITR	Multiband Inter/Intra Team Radio (MBITR)	1999
Radio- SIRFC	SIRFC	Suite of Integrated Radio Frequency Countermeasures (SIRFC) (U)	2002
Radio- WIN-T	WIN-T	Warfighter Information Network - Tactical (WIN-T)	2003
Raptor ICO	Raptor ICO	Raptor-Intelligent Combat Outpost	1999
Religion- CC	CC	Containerized Chapel (CC)	2002
Religion- CLSP	CLSP	Chaplaincy Logistical Support Package (CLSP)	2001
REMBASS II	REMBASS II	Remotely Monitored Battlefield Sensor System II (REMBASS II)	2004
Rifle- 5.56mm- Carbine- Buttstock-Sling- IB/CQBS	IB/CQBS	Improved Buttstock and Close Quarters Battle Sling (IB/CQBS) for the Modular Weapons System (MWS)	1999
Rifle- 5.56mm- Cartridge- GREM M100	GREM M100	M100 Grenade Rifle Entry Munition (GREM)	2008
Rifle- 5.56mm- Cartridge- RLEM	RLEM	Rifle Launched Entry Munition (RLEM)	2001
Rifle- 5.56mm- Cartridge- RLEM	RLEM	XM100 Rifle Launched Entry Munition (RLEM)	2000
Rifle- 5.56mm- Cartridge- RLNLM XM95	RLNLM XM95	XM95 Rifle Launched Non-Lethal Munition (RLNLM)	1999
Rifle- 5.56mm- Cartridge- RLNLM XM95	RLNLM XM95	XM95 Rifle launched Non-Lethal Munition (RLNLM)	2000
Rifle- 5.56mm- M16/M4	M16/M4	Dust Assessment of the M4 Carbine, M16 Rifle and M249 Machine Gun	2007
Rifle- 5.56mm- M16/M4- Sight- CCO	CCO	Close Combat Optic (CCO)	1997
Rifle- 5.56mm- M16/M4- Sight- LWTS	LWTS	AN/PVS-13B(V)1 Light Thermal Weapon Sight (LTWS)	2002
Rifle- 5.56mm- M16/M4- Sight- LWTS II	LWTS II	BAE Light Weapon Thermal Sight II (LWTS II), AN/PAS-13C(V)1	2006
Rifle- 5.56mm- M16/M4- Sight- TLOS	TLOS	Target Location and Observation System (TLOS)	1998
Rifle- 5.56mm- M16/M4A1- MWS	MWS	Modular Weapon System (MWS)	1998

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Rifle- 5.56mm- Machine Gun- SAW M249 AP	SAW M249 AP	Assault Pack for the Machinegun, 5.56-MM, M249 S	1998
Rifle- 5.56mm- Machine Gun- SAW M249 SB	SAW M249 SB	M249 Squad Automatic Weapon With Short Barrel	2000
Rifle- 5.56mm- Machine Gun- Sight- MWTS II	MWTS II	BAE Medium Weapon Thermal Sight II (MWTS II), AN/PAS-13C(V)2 / Abbreviated (ASER)	2006
Rifle- 5.56mm- OICW	OICW	Objective Individual Combat Weapon (OICW)	2000
Rifle- 50 Cal- LRSR XM107	LRSR XM107	XM107, .50 Caliber Long Range Sniper Rifle (LRSR)	2003
Rifle- 50 Cal/7.62mm/5.56mm- Sight- HWTS II	HWTS II	BAE Heavy Weapon Thermal Sight II (HWTS II), AN/PAS-13C(V)3	2006
Rifle- 50 Cal/7.62mm/5.56mm- Sight- TWS	TWS	Thermal Weapon Sight (TWS)	1998
Rifle- 50 Cal/7.62mm/5.56mm- Sight- TWS-OMNI	TWS-OMNI	Thermal Weapon Sight (TWS) - OMNI	2001
Rifle- 50 Cal/7.62mm/5.56mm- Sight- TWS-R	TWS-R	Thermal Weapon Sight - Redesign (TWS-R)	2000
Rifle- 7.62mm- Cartridge- APC M993	APC M993	7.62mm Armor Piercing Cartridge (APC) M993	1999
Rifle- 7.62mm- Cartridge- SRTA	SRTA	7.62mm Short Range Training Ammunition (SRTA)	2000
Rifle- 7.62mm- Machine Gun- M240E6	M240E6	M240E6 Medium Machine Gun (MG) / Abbreviated (ASER)	2008
Rifle- 7.62mm- Machine Gun- Sight- MGO	MGO	Machinegun Optic (MGO)	1999
Rifle- 7.62mm- Machine Gun- Sight- MGO	MGO	XM-145 Machinegun Optic (MGO)	1998
Rifle- 7.62mm- SASS	SASS	XM110, 7.62 X 51mm Caliber Semi-Automatic Sniper System (SASS)	2006
Rifle- 7.62mm- SASS	SASS	XM110, 7.62 X 51mm Caliber Semi-Automatic Sniper System (SASS)	2007
Rifle- 7.62mm- Sight- SNS	SNS	AN/PVS-10 Sniper Night Sight (SNS)	1998
Rifle- 84mm- Cartridge- Recoilless- ADM-401	ADM-401	Area Defense Munition (ADM)-401	2001
Rocket- GLMRS	GLMRS	Guided Multiple Launch Rocket System (GMLRS) Integrated Test and Evaluation	1998
Rocket- GMLRS-DPICM	GMLRS-DPICM	Guided Multiple Launch Rocket System (GMLRS) with Dual Purpose Improved Conventional Munitions (DPICM)	2005
Rocket- GMLRS-U	GMLRS-U	XM31E1 Guided Multiple-Launch Rocket System-Unitary (GMLRS-U) Rocket	2008
Rocket- LaSER-	LaSER-	Full Material Release Decision for the Shoulder Launched Munition Multiple Integrated Laser Engagement System (SLM MILES)	2007
Rocket- Minefield Breaching- RAFAEL CARPET	RAFAEL CARPET	RAFAEL Minefield Breaching System, CARPET	2003
Rocket- SMAW-D	SMAW-D	Shoulder-Launched Multipurpose Assault Weapon - Disposable (SMAW-D), The Bunker Defeat Munition (BDM),	1998
RRDF-MCS	RRDF-MCS	Roll-On/Roll-Off Discharge Facility (RRDF) and Floating Causeway (FC) Subsystems of the Modular Causeway System (MCS)	2002

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RSCCE	RSCCE	Replacement Satellite Configuration Control Element (RSCCE)	1999
SAMGL	SAMGL	Antipersonnel Landmine Alternative (APLA) Program. Non Self Destruct-Alternative (NSD-A) (Milestone I/II Decision). Soldier-Activated Munition, Grenade Launched (SAMGL) Prototype (Alliant Techsystems)	2000
SDS	SDS	Special Operations Forces Sniper/Gunshot Detection System (SDS)	2000
Search Mirrors	Search Mirrors	Search Mirrors	2000
Shotgun- 12 Gauge- MASS	MASS	XM26 Modular Accessory Shotgun System (MASS)	2007
Shotgun- Cartridge- 12 Gauge- Breaching Round M1030	Breaching Round M1030	Cartridge, 12 Gauge Breaching Round, M1030	2007
Shotgun- Cartridge- 12 Gauge- Breacher	Breacher	12 Gauge Breacher	2001
Shotgun- Cartridge- 12 Gauge- NLA	NLA	12 Gauge Shotgun Non-Lethal Ammunition	2000
SICPS-CPP	SICPS-CPP	Standardized Integrated Command Post System - Command Post Platform (SICPS-CPP)	2003
SIIRCM	SIIRCM	Suite of Integrated Infrared Countermeasures (SIIRCM)	2003
SKA-CAA XM279	SKA-CAA XM279	Sampler Kit, Air (SKA): Chemical Agent Alarm (CAA), XM279	2000
SMART-T	SMART-T	Secure, Mobile, Anti-Jam, Reliable, Tactical Terminal (SMART-T)	2002
Smoke Pot M8	Smoke Pot M8	M8 Smokepot	1998
Sorbent	Sorbent	Sorbent Decontamination System (SDS)	2002
Suit- Protective- JSLIST P3I	JSLIST P3I	Joint Service Lightweight Integrated Suit Technology (JSLIST) Pre-Planned Product Improvement (P3I)	2001
TACLANE	TACLANE	TACLANE KG-175 In-Line Network Encryptor	2002
TC-AIMS II	TC-AIMS II	Transportation Coordinators' - Automated Information for Movements System II (TC-AIMS II)	2004
TPIAL	TPIAL	AN/PEQ-2 Target Pointer/Illuminator/Aiming Light (TPIAL)	2000
Uniform- ACU	ACU	Army Combat Uniform (ACU)	2004
Vehicle- Crew- MSS	MSS	Mounted Soldier System (MSS) in Support of a Milestone B Decision	2007
Vehicle- Fuel- FSSP	FSSP	Fuel System Supply Point (FSSP) Type 5-800K / Abbreviated (ASER)	2007
Vehicle- Teleoperation- VTC	VTC	Vehicle Teleoperation Capability (VTC)	1997
Vehicle- Tracked- Bulldozer- DEUCE-CPK	DEUCE-CPK	Deployable Universal Combat Earthmover-Crew Protection Kit (DEUCE-CPK)	2003
Vehicle- Tracked- Engineer- HYEX	HYEX	Hydraulic Excavator (HYEX)	2000
Vehicle- Tracked- Engineer- HYEX	HYEX	Hydraulic Excavator (HYEX), Crawler Mounted, Type I / Abbreviated (ASER)	2007
Vehicle- Tracked- IFV- Bradley BFVS Linebacker M-6	Bradley BFVS Linebacker M-6	Bradley Linebacker (Training Release)	1998
Vehicle- Tracked- IFV- Bradley BFVS Linebacker M-6	Bradley BFVS Linebacker M-6	Bradley Linebacker Weapon System	1997

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Vehicle- Tracked- IFV- Bradley BFVS M2A3/M3A3	Bradley BFVS M2A3/M3A3	Bradley Fighting Vehicle System - M2A3	2000
Vehicle- Tracked- IFV- Bradley BFVS M2A3/M3A3	Bradley BFVS M2A3/M3A3	Bradley Fighting Vehicle System (BFVS) - M2/M3A3	2001
Vehicle- Tracked- IFV- Bradley BFVS M2A3/M3A3	Bradley BFVS M2A3/M3A3	Bradley Fighting Vehicle System A3 (BFVS-A3) Low Rate Initial Production 1 Decision	1997
Vehicle- Tracked- IFV- Bradley BFVS ODS-E	Bradley BFVS ODS-E	M2A2 Bradley Fighting Vehicle System (BFVS) Operation Desert Storm-Engineer (ODS-E)	2002
Vehicle- Tracked- IFV- Bradley LBR-6	Bradley LBR-6	Bradley Fighting Vehicle System LBR-6 Reactive Armor Test Program	2006
Vehicle- Tracked- Tank- Abrams M1A2 SEP	Abrams M1A2 SEP	M1A2 Abrams System Enhancement Package (SEP)	2001
Vehicle- Tracked- Tank- Abrams M1A2 SEP	Abrams M1A2 SEP	M1A2 Abrams Tank	1997
Vehicle- Tracked- Tank- HAB- Wolverine M1A2 SEP	Wolverine M1A2 SEP	Heavy Assault Bridge (HAB), XM104 (WOLVERINE)	2000
Vehicle- Tracked- Tank- HAB- Wolverine M1A2 SEP	Wolverine M1A2 SEP	Phase 2 of the Vulnerability Test (Including Live Fire) for the Wolverine Heavy Assault Bridge (HAB) (U)	1999
Vehicle- Tracked- Tank- Patton M60A1E3	Patton M60A1E3	M60A1E3 Tank IOC(U)	1979
Vehicle- Tracked- USMC AAV EFV	USMC AAV EFV	U.S. Marine Corps Advanced Amphibious Assault Vehicle	2004
Vehicle- VLAD	VLAD	Vehicle Lightweight Arresting Device (VLAD)	2004
Vehicle- Wheeled- Bridge- REBS	REBS	Rapidly Emplaced Bridge System (REBS)	2006
Vehicle- Wheeled- Cargo- 2 1/2 Ton ESP Van	2 1/2 Ton ESP Van	2 1/2 Ton Extended Service Program (ESP) Shop Van, M109A4	1998
Vehicle- Wheeled- Cargo- Dump Truck M917A1	Dump Truck M917A1	M917A1 Dump Truck, 18.5 Ton, 14 Cubic Yard	1998
Vehicle- Wheeled- Cargo- FMTV 10 Ton Dump Truck	FMTV 10 Ton Dump Truck	Family of Medium Tactical Vehicles A1 Rebuy (FMTV A1R) 10-Ton Dump Truck	2008
Vehicle- Wheeled- Cargo- FMTV EV	FMTV EV	Family of Medium Tactical Vehicles A1 Rebuy (FMTV A1R) Expansive Van (EV) Variant	2006
Vehicle- Wheeled- Cargo- FMTV LHS	FMTV LHS	Family of Medium Tactical Vehicles A1 Rebuy (FMTV A1R) Load Handling System (LHS) Variant	2006
Vehicle- Wheeled- Cargo- FMTV LVAD	FMTV LVAD	Family of Medium Tactical Vehicles (FMTV) A1 Low Velocity Airdrop (LVAD)	2007
Vehicle- Wheeled- Cargo- HEMTT-LHS	HEMTT-LHS	XM1120 Heavy Expanded Mobility Tactical Truck-Load Handling System (HEMTT-LHS)	2000
Vehicle- Wheeled- Cargo- Trailer- CBC	CBC	M105A2 1 1/2-Ton Cargo Trailer Cargo Bed Cover (CBC)	2000
Vehicle- Wheeled- Cargo- Trailer- LTT-R	LTT-R	Light Tactical Trailer-Rebuy (LTT-R) Program / Abbreviated (ASER)	2005
Vehicle- Wheeled- Cargo- Truck Tractor M915A3	Truck Tractor M915A3	M915A3 Truck Tractor, Line Haul	2000
Vehicle- Wheeled- Cargo- Truck Tractor M915A4	Truck Tractor M915A4	M915A4 Truck Tractor Upgrade Program	1999
Vehicle- Wheeled- Cargo- Water Trailer XM1112	Water Trailer XM1112	XM1112 Water Trailer, 400-Gallon, 8-Wheeled	1999
Vehicle- Wheeled- Crane- ATEC	ATEC	All-Terrain Crane (ATEC)	1998
Vehicle- Wheeled- Engineer-Forklift- ATLAS	ATLAS	All-Terrain Lifter, Army System (ATLAS)	1998

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Vehicle- Wheeled- Engineer- HMEE	HMEE	High Mobility Engineer Excavator (HMEE) Type I System	2008
Vehicle- Wheeled- Engineer- I- HMEE	I-HMEE	Interim High Mobility Engineer Excavator (I-HMEE)	2002
Vehicle- Wheeled- Engineer- I- HMEE	I-HMEE	Interim High Mobility Engineer Excavator (I-HMEE) (Phase II)	2003
Vehicle- Wheeled- Engineer- Trailer- Towed Roller	Towed Roller	Towed Roller, Pneumatic Tire, Hopper Body, Oscillating Wheels (R03402)	1998
Vehicle- Wheeled- Engineer- Vibration Roller	Vibration Roller	Vibration Roller	2000
Vehicle- Wheeled- FMTV- CK	CK	Containerized Kitchen (CK) (Type Classification- Generic)	1998
Vehicle- Wheeled- FTTS MSV	FTTS MSV	Future Tactical Truck System (FTTS) Maneuver Sustainment Vehicle (MSV)	2007
Vehicle- Wheeled- FTTS UV IMG	FTTS UV IMG	Future Tactical Truck System (FTTS) Utility Vehicle (UV) International Military Group (IMG)	2007
Vehicle- Wheeled- FTTS UV LM	FTTS UV LM	Future Tactical Truck System (FTTS) Utility Vehicle (UV) Lockheed Martin (LM)	2007
Vehicle- Wheeled- IFV- 120mm- Stryker Mortar Carrier-B	Stryker Mortar Carrier-B	Stryker Mortar Carrier - B	2006
Vehicle- Wheeled- IFV- Stryker FOV	Stryker FOV	Stryker Family of Vehicles	2004
Vehicle- Wheeled- IFV- Stryker MGS	Stryker MGS	Stryker Mobile Gun System	2008
Vehicle- Wheeled- MRAP- MPCV Buffalo	MPCV Buffalo	BUFFALO, Mine Protected Control Vehicle (MPCV)	2001
Vehicle- Wheeled- MRAP- MPCV CASSPIR	MPCV CASSPIR	CASSPIR, Mine Protected Control Vehicle (MPCV)	2002
Vehicle- Wheeled- Rocket- HIMARS	HIMARS	High Mobility Artillery Rocket System (HIMARS)	2003
Vehicle- Wheeled- Rocket- HIMARS	HIMARS	High Mobility Artillery Rocket System (HIMARS)	2005
Vehicle- Wheeled- Trailer- Low Bed Semitrailer M870A3	Low Bed Semitrailer M870A3	M870A3 Semitrailer, Low Bed, 40 Ton	2003
Vehicle- Wheeled- Trailer- TMWSS	TMWSS	Trailer-Mounted Welding Shop Set (TMWSS)	2002
Vehicle- Wheeled- Utility- HMMWV CBC	HMMWV CBC	High Mobility Multipurpose Wheeled Vehicle (HMMWV) Cargo Bed Cover (CBC)	2000
Vehicle- Wheeled- Utility- HMMWV ECV XM1113	HMMWV ECV XM1113	High Mobility Multipurpose Wheeled Vehicle (HMMWV) XM1113 Utility Truck, Expanded Capacity Vehicle (ECV)	1998
Vehicle- Wheeled- Utility- HMMWV ECV XM1114	HMMWV ECV XM1114	High Mobility Multipurpose Wheeled Vehicle (HMMWV) XM1114 Up Armored Expanded Capacity Vehicle (ECV)	1999
Vehicle- Wheeled- Utility- HMMWV- JSLNBCRS	JSLNBCRS	Joint Service Light Nuclear, Biological, Chemical, Reconnaissance System (JSLNBCRS)	2003
Vehicle- Wheeled- Utility- HMMWV- JSLNBCRS- HMMWV	JSLNBCRS- HMMWV	Joint Service Nuclear, Biological, and Chemical Reconnaissance System (JSLNBCRS) High Mobility Multipurpose Wheeled Vehicle (HMMWV) Variant	2006
Vehicle- Wheeled- Utility- HMMWV MCCM- VMS	HMMWV MCCM- VMS	Modular Crowd Control Munition (MCCM) Vehicle Mount System (VMS)	2000

<b>Test &amp; Evaluation Reports Ordered by Short Name Categorized- Short Name- Long Name- Year</b>			
<b>Short Name Categorized</b>	<b>Short Name</b>	<b>Long Name</b>	<b>Year</b>
Volcano- CLADS	CLADS	Canister Launched Area Denial System (CLADS)	1999
Volcano- Towed	Towed	Towed Volcano	2002

### 13. T&E Reports With MANPRINT Investigations- Annotated Bibliography.

This section contains the bibliographic listings for all the T&E documents in this report in order by categorized system short name.

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**System Short Name:** SER- ABCS- AFATDS

**Reference** (Johnson et al., 2002):

Johnson, O., Riggs, C., Womack, L., & Welsh, M. (2002). System Assessment (SA) for the Addendum to the Advanced Field Artillery Tactical Data System (AFATDS) 99: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report # 21068637.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

**System Description:**

The AFATDS 99 is an Acquisition Category (ACAT) IIC (with Office of the Secretary of Defense [OSD] oversight), post-Milestone III system that provides the multi-service (Army and USMC) automated fire support command, control, and communications portion of the ABCS. The AFATDS 99 provides integrated, automated support for planning, coordinating, and controlling all fire support assets (field artillery, mortars, close air support, naval gunfire, attack helicopter, and offensive electronic warfare [EW]) and for executing counterfire, interdiction, and suppression of enemy targets for close and deep operations. The AFATDS 99 shares information with the other ABCS Battlefield Functional Area (BFA) systems and exchanges data with FBCB2, Integrated Meteorological System (IMETS), and Global Command and Control System-Army (GCCS-A). The AFATDS 99 also interoperates with USMC command and control (C2) systems via the Joint Maritime Command Information System [JMCIS]) and with Allied systems within the Artillery Systems Cooperation Activities (ASCA) program. The AFATDS 99 consists of fire support application software with Common Hardware Software (CHS) equipment housed in Standardized Integrated Command Post System (SICPS) vehicle configurations and Tactical Operations Centers (TOCs). The AFATDS 99 provides automated planning and execution capabilities to fire support (FS) operational facilities (OPFACs) that include one or more AFATDS 99 workstations, communication equipment, and the tactical vehicles housing this equipment, connected by a Local Area Network (LAN). The AFATDS 99 workstations use CHS components configured as the CHS~2 Ultra Scalable Processor Architecture (SPARC) Computer Unit (UCUs) or the Compact Computer Unit (CCU). Communications equipment includes the Combat Net Radio (CNR), Enhanced Position Location Reporting System (EPLRS), Mobile Subscriber Equipment (MSE), and the USMC Unit Level Switch (ULS).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- AMDWS FAAD C2I

**Reference** (Johnson et al., 2008):

Johnson, K., Wong, N., Heasley, J., Reza, J., Welsh, M., Belanger, F., & Mares, A. L. (2008). System Assessment (SA) for the Forward Area Air Defense Command, Control, and Intelligence (FAAD C2I) System Block III Version 5.4a-7.2 (V5.4a) Software: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB336674.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

120500 - Computer Programming and Software  
150301 - Antimissile Defense Systems  
150600 - Military Operations, Strategy and Tactics

**Descriptors:**

(U) \*COMPUTER PROGRAMS, \*MILITARY OPERATIONS, \*MILITARY EXERCISES, \*FORWARD AREA AIR DEFENSE SYSTEMS, TEST AND EVALUATION, DEFENSE SYSTEMS, TASK FORCES, HOMELAND DEFENSE, SURFACE TO AIR MISSILES, ARMY EQUIPMENT, BATTALION LEVEL ORGANIZATIONS, DEPLOYMENT, GUIDED MISSILES

**Identifiers:**

(U) AMERICAN SHIELD EXERCISE, COI(CRITICAL OPERATIONAL ISSUE), SHORAD(SHORT RANGE AIR DEFENSE)

**System Description:**

The FAAD C2I system concept incorporates a suite of capabilities designed to counter the low-altitude air threat over a division's area of operations. The system consists of CHS, standardized integrated command post system (SICPS), and associated communications systems. The system uses automated collection, processing, distribution, and display of information to enhance the effectiveness of FAAD C2I weapon gunners and to support the combined arms team. Subsystems are interconnected by digital data communication networks established using tactical communications equipment. Voice communications are also established within all FAAD C2I subsystems using radio and wire communications equipment. Possible configurations of FAAD C2I include:

**ABMOC.** The ABMOC is responsible for monitoring and controlling the tactical operations of the FAAD battalion (BN). The ABMOC acquires air tracks from local sensors, adjacent FAAD C2I systems, airborne warning and control systems (AWACS) or like systems, and JTIDS networks. The ABMOC includes an operator input/output display that provides a representation of the real-time air pictures, the tactical ground situation, and the location of items of special interest. Information disseminated includes track data, air battle management information, and air defense artillery (ADA) command information.

**ADAM Cell.** The Air Defense Airspace Management (ADAM) Cell provides Army and joint Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance connectivity to the improved brigade combat team, by combining Air Missile Defense (AMD) and airspace coordination capabilities. The system comprises a set of modular, reconfigurable and standardized automatic data processing equipment. It is packaged in standard shelters, transported on standard vehicles, and supported by standard tactical power, communications, and environmental equipment. The ADAM Cell provides for the integration of weapons, sensors, and C3I to counter the entire spectrum of the threat to the defended area. Computer displays allow commanders and staff access to databases for the air picture, situation reports, enemy assessments, friendly force status, limited air space de-confliction, and maneuver control. The AMD components of the ADAM Cell are the AMDWS, joint air defense system integrator EO/situational awareness, FAAD C2 EO/situational awareness and a tactical airspace information system aviation component.

**Sensor C2.** The sensor/C2 node includes a FAAD C2 sensor shelter and Sentinel radar. The Sentinel provides air tracks to the FAAD C2 shelter via a hardwire data link. The sensor/C2 filters and broadcasts the air tracks within the defined sector to an assigned community of users such as the ADA Battery Command Post (BTRY CP), platoon (PLT)/section CP(s), and FUs.

**BTRY CP.** The BTRY CP subsystem provides the C2 capability for the tactical operations of subordinate elements and provides the interface to the supported brigade.

**PLT CP.** The PLT CP subsystem controls the tactical operations of subordinate weapon systems. The CP exchanges voice commands and information with subordinates and controlling CP. The system display filters the air picture to the area of operational interest. Additionally, the PLT CP can also be initialized as a digital relay to provide for an extended deployment range or needed line-of-sight capability between the Sensor/C2 and FU(s).

**FU.** The FU subsystem filters the received air tracks to display only the air situation in the immediate area of operational interest. Unknown and hostile tracks entering pre-designated ranges from the FU will initiate visual and audible alarms to alert the operator. Commands, information, and a composite air picture are displayed at the FU on the HTU or Applique + computer.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or

potentially significant military application. Other requests for this document must be referred to  
Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- ASAS CP-SS

**Reference** (Sullivan et al., 1997):

Sullivan, B., Kurinsky, L., Elder, W., Woolverton, W., Heuckeroth, O., Wong, N., & Kormelink, J. (1997).  
System Evaluation Report (SER) for the All Source Analysis System (ASAS) Capability Package-Single  
Source Limited User Test: U.S. Army Test and Evaluation Command (ATEC) (Formerly U.S. Army  
Operational Test and Evaluation Command- OPTEC), ATTN: CSTE-EAC-CC, Park Center IV, 4501 Ford  
Ave., Alexandria, VA 22302-1458. DTIC ADB232146.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

120500 - Computer Programming and Software

150400 - Military Intelligence

Descriptors:

(U) \*COMPUTER PROGRAMS, \*MILITARY INTELLIGENCE, \*MILITARY OPERATIONS, SOURCES,  
SURVIVABILITY, ARMY PERSONNEL, TOOLS, MISSIONS, PROCUREMENT, USER NEEDS,  
SYSTEMS ANALYSIS

Identifiers:

(U) ASAS(ALL SOURCE ANALYSIS SYSTEM)

**System Description:**

**The Mission.** A Single Source section contributes to the intelligence fusion process of the All Source section of the Analysis and Control Element (ACE) by satisfying two important needs. First, the Single Source section effectively answering the commander's requirements in terms of specific orders and requests (SOR) and requests for information (RI). Secondly, they must maintain a current accurate and complete battlefield picture. To accomplish these mission necessary fundamentals, CP-SS is to provide an adequate hardware configuration for an operational mission, and stable software applications and tools. These applications and tools must allow for basic operator support, i.e., receive and parse prescribed messages adequately; house data properly in databases; possess adequate data retrieval applications; and provide adequate graphical displays. Otherwise, given a software intensive system, even well trained soldiers could not conduct their Military Intelligence analysis mission to be operationally effective.

**Capability Package.** The CP-SS is a subset of the objective Block II system and comprises hardware and software modules which perform intelligence processing, system operations, and communications processing/interfaces at echelons above corps, at corps, and at division. The CP-SS provides Signals Intelligence (SIGINT) processing capability to the intelligence analyst. SIGINT is composed of Communications Intelligence (COMINT) and Electronics Intelligence (ELINT). This processing includes generation, transmission, reception, and database building of SIGINT products. The CP-SS will interface with the ASAS Block I All Source (AS) through the Block I Communications Control Set (CCS) to form an interim Analysis and Control Element (ACE) capability. CP-SS provides the addition of a third external hard disk drive to the system configuration necessary to mitigate technical deficiencies found during the pilot phase of LUT.

**Hardware Description.** The CP-SS hardware configuration which entered LUT is composed of six Single Source Workstations, three laser printers (two black and white and one color) connected on a local area network (LAN). An Auxiliary Communications Package (ACP) 3010 box provides the interface between the LAN and the Block I CCS. The Single Source Workstation consists of an Army Battle Command Systems (ABCS) Common Hardware/Software 2 (CHS-2), Version 2 (V2), High Capacity Computer Unit (RCU). The V2 HCU consists of: a Sun SPARC 20 model 71 (with a 75 megahertz (MHz) processor, and 256 megabytes (MB) of Random Access Memory (RAM), a 20-inch color monitor, two 4.2 gigabit (GB) external hard disk drives, one 3.5-inch floppy disk drive, and one compact disk read-only memory (CD ROM) drive.

**Software Capabilities.** The ASAS TEMP, Rev H, Nov 96, identified the Computer Software Configuration Items (CSCI) incorporated into CP-SS. An abridged list of these items is presented below, representing software version 1.8.6, which entered the CP-SS LUT.

- Create, Modify, Delete features.
- Doctrinal Template Support.
- Terrain Evaluation Module.
- Automatic Message Parsing and Interactive Message Generation.
- Integrated Data Base (IDB).
- Normalization, Alias, and Country Code Tables.
- Joint Collection Management Tools (JCMT).
- Dynamic Scheduler Asset Capability.
- Terrain Movement Analyzer and Sensor Placement Tool.
- Automatic and Interactive Correlation Support.
- Net Reconstruction Support.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- BCS3

**Reference** (Comer et al., 2007):

Comer, D., Long, J., Wong, N., Culver, A., & Powell, M. (2007). System Assessment (SA) for the Battle Command Sustainment Support System (BCS3): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB325521.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

**System Description:**

The Army established its requirement for a logistics command and control (C2) system in the mid-1980s. The Combat Service Support Control System (CSSCS) was the system developed to meet this requirement. The CSSCS was developed as an evolutionary process consisting of major software releases. The CSSCS was based on the Maneuver Control System (MCS) and included baseline data from the Standard Army Maintenance System Level-2 (SAMS-2) and the Standard Property Book System-Redesign (SPBS-R). In 2002, preparation for Operation Iraqi Freedom (OIF) resulted in a requirement to restructure the operational requirements and technical baseline supporting the Army's logistics C2 capabilities. In response to shortfalls experienced in-theater in obtaining actionable information regarding theater level distribution (to support the Coalition Forces Component Commander), the logistics community developed an innovative process that merges multiple existing data sources to create the Logistics Common Operating Picture (LCOP). The BCS3 is the foundation of the Army's LCOP. The BCS3 system is the integration of all of the previous logistics command systems. The BCS3 is the Combat Service Support (CSS) node of the Army Battle Command Systems (ABCS). The BCS3 will be fielded to the Corps, Division, and maneuver brigade, and at the CSS battalion level. The BCS3 system may also operate at echelons above the Corps (EAC).

The BCS3 is the Combat Service Support (CSS) node of the Army Battle Command Systems (ABCS). The BCS3 will be fielded to the Corps, Division, and maneuver brigade, and at the CSS battalion level. The BCS3 system may also operate at echelons above the Corps (EAC).

a. BCS3 Hardware (HW). The BCS3 HW configuration at most nodes will consist of commercial off-the-shelf (COTS) laptops. BCS3 may be set up as a server with other BCS3 laptop systems as clients. At EAC, there may be a server, rather than a laptop, to support Division and Corps data requests.

b. Platforms. The BCS3 operators will install BCS3 in garrison and tactical operations centers. It is not currently planned for installation on any mobile platform.

c. BCS3 Application Software. The BCS3 is designed as a decentralized processing and distributed database system with each node having sufficient processing capability and information to permit autonomous operations when and where appropriate.

d. Interfaces. Initial interface capabilities will include those items that provide CSS business information, in-transit visibility (ITV) and C2 situational awareness. One or more of the following means implements the internal and external BCS3 interfaces: tactical communications, commercial communications, transferable media, or Soldier - machine interface. The BCS3 system will interface with the following nine systems:

- (1) The Maneuver Control System (MCS).
- (2) Force XXI Battle Command Brigade and Below/Blue Force Tracking (FBCB2/BFT).
- (3) Integrated Logistics Analysis Program (ILAP).
- (4) Movement Tracking System (MTS).
- (5) Worldwide Port System (WPS).
- (6) Global Air Transportation Execution System (GATES).
- (7) Defense Transportation Reporting and Control System (DTRACS).
- (8) Electronic Military Personnel Office (EMILPO).
- (9) Command Post of the Future (CPOF).

e. External Interfaces. The primary interface for BCS3 with the other ABCS systems will be through the ABCS Battle Command Server (BCS) by means of the Publish-and-Subscribe System (PASS). The BCS3 will also exchange a limited set of Joint Variable Message System (JVMS) messages with MCS and FBCB2. Joint and combined service interfaces are via the Global Command & Control System - Army (GCCS-A). Interfaces between each CSS business system and BCS3 system are detailed in systems interface agreements or memorandums of agreement. The BCS3 system supports external communications via local area network (LAN), wide area network (WAN), and satellite communications systems.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- CPOF

**Reference** (ATEC, 2005):

ATEC. (2005). System Evaluation Report (SER) for the Command Post of the Future (CPOF) / Abbreviated (ASER): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB305865.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

120700 - Computer Systems

250500 - Command, Control and Communications Systems

Descriptors:

(U) \*COMPUTERS, \*COMMAND AND CONTROL SYSTEMS, TEST AND EVALUATION, COMPUTER PROGRAMS, DECISION MAKING, SURVIVABILITY, LOCAL AREA NETWORKS, OPERATIONAL READINESS, INTEROPERABILITY, OFF THE SHELF EQUIPMENT, WIDE AREA NETWORKS, COMPUTER GRAPHICS, EMBEDDING, SYSTEMS ANALYSIS, SITUATIONAL AWARENESS, COMMUNICATIONS PROTOCOLS, NETWORK ARCHITECTURE

Identifiers:

(U) CPOF(COMMAND POST OF THE FUTURE), ASER(ABBREVIATED SYSTEM EVALUATION REPORT), VOIP(VOICE OVER INTERNET PROTOCOL), ABCS(ARMY BATTLE COMMAND SYSTEM)

**System Description:**

Command Post of the Future (CPOF).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- CPOF ver. 2.4

**Reference** (Hollister et al., 2005):

Hollister, C., Kim, E. S., Harris, D., Pliscof, M., Culver, A., Powell, M., Clifford, S., Grynovicki, J., Miscavage, B., & Wong, N. (2005). System Assessment (SA) for the Command Post of the Future (CPoF) Version 2.4: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report Classified SECRET/NOFORN, Citation Classified as Unclassified/FOUO. DTIC ADC072542. Report # 70369224.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

250500 - Command, Control and Communications Systems

120600 - Computer Hardware

120700 - Computer Systems

Descriptors:

(U) \*COMMAND AND CONTROL SYSTEMS, \*DECISION SUPPORT SYSTEMS, DECISION MAKING, SITUATIONAL AWARENESS, DATA ACQUISITION, PLANNING

Declassification:

3 May 2016

Identifiers:

(U) CPOF(COMMAND POST OF THE FUTURE), OPERATIONAL ASSESSMENT, SHARED WORKSPACES, SHARED OPERATIONAL PICTURE, COLLABORATIVE TOOLS

**System Description:**

(From unclassified MANPRINT Report)

The Command Post of the Future (CPOF) is a technical insertion into the Maneuver Control System (MCS) as an acquisition category 1AC program, with Office of the Secretary of Defense oversight (Miscavage and Pagan, 2006). CPOF (PdM-CPOF, 2006a) is an executive level Command and Control (C2) and decision support system providing situational awareness and collaborative tools to support decision-making. CPOF supports visualization, information analysis and collaboration in a single integrated environment that enables the commanders and decision makers to analyze information, share thoughts and evaluate courses of action. CPOF also supports parallel, synchronous and asynchronous cross-functional planning and execution.

CPOF is deployed at Corps to Battalion levels, enabling commanders to discuss and collaborate when processing information, share ideas, and attend virtual meetings without assembling at one place. The system has advanced visualization tools such as audio conferencing and other collaboration tools, allowing commanders to communicate, collaborate and share information.

CPOF uses a Spiral Development Strategy of releasing new capabilities in a software release in January of each year. These software releases feed into Army Software Blocks that are lab tested for interoperability and field-tested in conjunction with the Army test organizations, usually in conjunction with a Military Readiness Exercise (MRX).

The system is maintained as "liquid information" in database format, which separates the data from the viewing space. This method enables faster visualization and optimal maintenance of large volumes of constantly changing information. The system gathers real-time and near-real-time feeds from multiple C2 applications. Constant monitoring of the battlefield is provided, by tracking the combat elements on maps or satellite photos and video feeds from battlefield sensors, following enemy forces through intelligence reports, ground observations, forward units or unmanned aerial vehicles (UAVs). Commanders no longer have to call on the radio to check the status of each unit. CPOF supports commercial presentation style

briefings, including maps, photos, and video. The participants can respond sketching out their comments on the shared "Battle board" presented in each location and at the central Command Post (CP) video wall.

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- CPOF ver. 3.0.2

**Reference** (Hollister et al., 2006):

Hollister, C., Kim, E. S., Harris, D., Pliscof, M., Culver, A., Powell, M., Clifford, S., Grynovicki, J., Miscavage, B., & Wong, N. (2006). System Assessment (SA) for the Command Post of the Future (CPoF) Version 3.0.2. U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report # 61609145. DTIC ADC072933. Report Classification: SECRET/NOFORN. Citation Unclassified.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

120400 - Operations Research

120500 - Computer Programming and Software

150600 - Military Operations, Strategy and Tactics

Descriptors:

(U) \*COMPUTER PROGRAMS, \*LOGISTICS SUPPORT, \*TECHNOLOGY ASSESSMENT, \*SYSTEMS ANALYSIS, TEST AND EVALUATION, OPERATIONAL READINESS, COMPUTER ARCHITECTURE, MISSIONS, RISK ANALYSIS, TEXAS, CALIFORNIA, MANPOWER, INTEROPERABILITY, MILITARY OPERATIONS, SIMULATION

Declassification:

1 Jul 2016

Identifiers:

(U) CPOF(COMMAND POST OF THE FUTURE), OPERATIONAL ASSESSMENT, SHARED WORKSPACES, SHARED OPERATIONAL PICTURE, COLLABORATIVE TOOLS

**System Description:**

From: ADB340344: The Command Post of the Future (CPOF) is a technical insertion into the Maneuver Control System (MCS) as an acquisition category 1AC program, with Office of the Secretary of Defense oversight (Miscavage and Pagan, 2006). CPOF (PdM-CPOF, 2006a) is an executive level Command and Control (C2) and decision support system providing situational awareness and collaborative tools to support decision-making. CPOF supports visualization, information analysis and collaboration in a single integrated environment that enables the commanders and decision makers to analyze information, share thoughts and evaluate courses of action. CPOF also supports parallel, synchronous and asynchronous cross-functional planning and execution.

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CPOF uses a Spiral Development Strategy of releasing new capabilities in a software release in January of each year. These software releases feed into Army Software Blocks that are lab tested for interoperability and field-tested in conjunction with the Army test organizations, usually in conjunction with a Military Readiness Exercise (MRX).

The system is maintained as "liquid information" in database format, which separates the data from the viewing space. This method enables faster visualization and optimal maintenance of large volumes of constantly changing information. The system gathers real-time and near-real-time feeds from multiple C2

applications. Constant monitoring of the battlefield is provided, by tracking the combat elements on maps or satellite photos and video feeds from battlefield sensors, following enemy forces through intelligence reports, ground observations, forward units or unmanned aerial vehicles (UAVs). Commanders no longer have to call on the radio to check the status of each unit. CPOF supports commercial presentation style briefings, including maps, photos, and video. The participants can respond sketching out their comments on the shared "Battle board" presented in each location and at the central Command Post (CP) video wall.

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- DTSS

**Reference** (Grady et al., 1999):

Grady, E., Zwicke, R., Meirose, S., & Tierney, R. (1999). System Assessment (SA) for the Digital Topographic Support System-Heavy (DTSS-H) AN/Tyq-48a1 Material Release Decision: U.S. Army Operational Test and Evaluation Command, Part Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB244247.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

080200 - Cartography and Aerial Photography

Descriptors:

(U) \*TOPOGRAPHIC MAPS, \*DIGITAL MAPS, \*TERRAIN INTELLIGENCE, TEST AND EVALUATION, OPERATIONAL EFFECTIVENESS, DECISION AIDS, VIDEO MAPPING

Identifiers:

(U) DTSS-H(DIGITAL TOPOGRAPHIC SUPPORT SYSTEM HEAVY), AN/TYQ-48A1

**System Description:**

The DTSS-H is a system resulting from integrating the functional requirements of the DTSS and the Quick Response Multicolor Printer (QRMP) into a configuration that is housed in a 20-foot International Standardization Organization (ISO) container mounted on an M942 5-ton truck. The system will produce automated terrain analysis products and digital topographic data to support the Army Tactical Command and Control System (ATCCS). It will receive, reformat, create, store, retrieve, update, manipulate, and densify digital terrain data to produce terrain analysis products; it will also produce quick-turnaround, low-volume, multicolor topographic products. The system provides computer-generated terrain analysis information to support battlefield operations at division, corps, and echelons above corps. The major inputs to this system are digital terrain analysis data produced by the National Imagery Mapping Agency (NIMA) (formerly the Defense Mapping Agency (DMA)); these data include digital terrain elevation data, interim terrain data, and tactical terrain data that contain feature data including slope, vegetation, soil, drainage, transportation, obstacles, buildings, and cultural information. These inputs come from direct digital sources such as files on hard disk; compact disk, read-only memory (CDROM), digital audio tape (DAT); and magneto-optical disks. A large-format, optical scanning device provides the ability to transfer hard copy visual data into easily modified digital data. Output capabilities include the processing of data into usable spectral imagery products from storage, retrieval, and replacement of the data file, and the production of multiple copies of graphic and nongraphic battlefield terrain products. The mission and function of the DTSS-H is to provide automated and integrated terrain products, which include tactical decision aids, terrain intelligence, digital map products, and hard copy map products.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or

potentially significant military application. Other requests for this document must be referred to  
Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- DTSS-D

**Reference** (Clark et al., 2002):

Clark, M., Maruyama, D., Brabson, G., Halke, B., Robinson, J., Padgett, D., Alvarez, D., & Borns, N.  
(2002). System Assessment (SA) for the Digital Topographic Support System - Deployable (DTSS-D):  
U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-  
1458. DTIC ADB292201.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)  
Fields and Groups:

120500 - Computer Programming and Software

080200 - Cartography and Aerial Photography

Descriptors:

(U) \*TEST AND EVALUATION, \*INFORMATION SYSTEMS, DIGITAL SYSTEMS, MILITARY  
REQUIREMENTS, VERIFICATION, TERRAIN, TOPOGRAPHY, OPERATIONAL EFFECTIVENESS,  
DIGITAL MAPS, COMPUTER PROGRAM RELIABILITY, MEASURES OF EFFECTIVENESS

Identifiers:

(U) DTSS-D(DIGITAL TOPOGRAPHIC SUPPORT SYSTEM-DEPLOYABLE)

**System Description:**

The DTSS-D is a combination of commercial-off-the-shelf (COTS) and Army Common Hardware/Software (CHS) components that are placed into ruggedized carrying cases to facilitate deployment with tactical forces. The DTSS-D hosts commercial Geographic Information System (GIS) and image processing software packages designed to provide direct topographic services support to the command and staff elements at brigade, division, corps, or theater. The DTSS-D deployed at all echelons, for set-up in a garrison or sea-going surface vessel environment, and for light infantry division or brigade use where vehicles are minimized. Mobility and shelter requirements will be the responsibility of the units to which it is assigned or employed.

The DTSS-D v1, AN/TYQ-71, is the portable configuration of the DTSS. It is a tactical, computer-based system which allows the terrain analyst to utilize hardcopy and digital terrain data to produce real-time and near real-time terrain analysis and special purpose products for the battlefield commander. The system also allows hardcopy production of large format, multicolor, topographic products in a timely manner. The DTSS-D is transported on vehicles organic to each unit and internally in the CH-47 helicopter. The Multi-Spectral Imagery Processor (MSIP) version of the DTSS-D was the predecessor to the DTSS-D v1. Initial MSIP version DTSS-D was TC-S in July 1997. The DTSS-D v1 was not separately type classified but rather issued under the existing line item number with a new national stock number.

The new DTSS-D configuration is as follows:

- The military ruggedized version of the CRS - Version 2 Workstation, with:
  - Windows -NT
  - Dual 933 MHz Pentium III
  - 1 GB Synchronous Dynamic Random Access Memory (RAM)
  - 25 GB Removable Drive
  - Iomega JAZ Drive
  - Digital Video Disc (DVD) - RAM Drive
  - 8mm Tape Drive
  - Personal Computer Memory Card International Association Card Slot
  - Ethernet (10/100 Base T) Board
- Stereo Monitor - 21-inch (Viewsonic)
- Ideal 36-inch Scanner
- Yamaha Compact Disk Reader-Writer
- IBM ThinkPad 750 MHz, 20 GB RD, Laptop
- Hewlett Packard 36-inch Plotter

- CISCO 24 Port Switch with FO (fiber optic)
- Winchester Flash Disk Redundant Array of Independent Disks (RAIDs)- 512 Gigabyte
- 1000W Uninterruptible Power Source (UPS)
- Transit Cases
  - Workstation and Peripherals
  - Plotter
  - Scanner
  - Monitor
  - RAID
  - Additional Peripherals

The DTSS-D will provide critical, timely, and accurate digital and hardcopy geospatial information to support mission planning and execution. The DTSS-D missions include the generation and compilation of geospatial data, development and management of a geospatial database, geospatial information processing, geospatial information and services, special map reproduction, and geodetic survey support as defined in the Army Battle Command System (ABCS) Capstone Requirements Document (CRD). The DTSS-D will use CTIS software version 7.0. The CTIS is a combination of COTS and government-furnished equipment (GFE) software tools for digital topography. Other DTSS variants include the DTSS-High Volume Map Production (DTSS-HVMP), DTSS-L, the DTSS-Base (DTSS-B) and the DTSS-Survey (DTSS-S). A description of the various DTSS systems is in table 1-1.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- DTSS-HVMP

**Reference** (Clark et al., 2003):

Clark, M., Maruyama, D., Dedrick, E., Halke, W., & Robinson, J. (2003). System Evaluation Report (SER) for the Digital Topographic Support System - High Volume Map Production (DTSS-Hvmp): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 30938803. DTIC ADB287670.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

080200 - Cartography and Aerial Photography

Descriptors:

(U) \*TOPOGRAPHIC MAPS, \*DIGITAL MAPS, IMAGE PROCESSING, DIGITAL SYSTEMS, DATA ACQUISITION, TERRAIN INTELLIGENCE

Identifiers:

(U) FRP(FULL RATE PRODUCTION), DTSS(DIGITAL TOPOGRAPHIC SUPPORT SYSTEM), HVMP(HIGH VOLUME MAP PRODUCTION)

**System Description:**

Key Features: The DTSS-HVMP consists of printing and paper cutting equipment (mission equipment) mounted in a single 20-foot International Standardization Organization (ISO) shelter placed on an Army standard 5-ton truck. The DTSS-HVMP mission equipment consists of:

- Two large format printers.
- A 61-inch width high-speed paper cutter.
- A computer workstation.
- Area for limited post-production activities (collation, packaging, labeling, temporary storage, and preparation for distribution).
- Space for paper conditioning and consumables/product storage.

The DTSS-HVMP will be fielded to units located at Corps and Echelons above Corps (EAC).

Interface: The DTSS-HVMP interfaces with other DTSS configurations and is capable of receiving and printing their digital files and augmenting their output with high volume printing capabilities. The system also has interoperability features that allow it to electronically connect to a Command Post LAN. This allows a variety of customers from Army Command and Control (C2) systems the ability to send and print digital files through DTSS-L or DTSS-D via a LAN. 1.3.4 The DTSS-HVMP is powered by a 15 kW towed tactical generator, PU-802.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- DTSS-L

**Reference** (Clark et al., 2002):

Clark, M., Maruyama, D., Brabson, G., Halke, B., Robinson, J., Padgett, D., Alvarez, D., & Borns, N. (2002). *System Assessment (SA) for the Digital Topographic Support System - Light AN/Tyq-67(V2)*: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB287320.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

120500 - Computer Programming and Software

Descriptors:

(U) \*DIGITAL SYSTEMS, \*TOPOGRAPHY, TEST AND EVALUATION, COMPUTER PROGRAMS, ACCEPTANCE TESTS, REQUIREMENTS, INTEGRATED SYSTEMS, POLICIES, MANUFACTURING, PRODUCTION, INFORMATION SYSTEMS, SURVIVABILITY, WEAPON SYSTEMS, TERRAIN, USER NEEDS, SYSTEMS ANALYSIS, ARMY

**System Description:**

The DTSS-L is a tactically mobile, transportable system configured within an M788/Gtype Lightweight Multipurpose Shelter (LMS) with an environmental control unit (ECU). This shelter is transported by the M1113 Expanded Capacity Vehicle (ECV) High Mobility Multipurpose Wheeled Vehicle (HMMWV) shelter carrying variant. Power is provided by a generator set consisting of a PU-798 10 kW generator mounted on an M116A1 trailer. An M101 trailer is also provided to carry supplies (extra paper/ink). The DTSS-L consists of Army common hardware/software (CHS), and commercial geographic information system (GIS) and image processing software packages designed to provide direct support to the command and staff elements at Brigade, Division, Corps, or Theater.

The DTSS-L is being developed to provide engineer topographic units with terrain graphics manipulation and reproduction capabilities. The DTSS-L provides automated assistance to the Army's terrain analysis mission. It has the capability to receive, format, create, store, retrieve, update, manipulate, and densify digital terrain data to produce terrain analysis products. The DTSS-L can also provide the ability to produce quick turnaround, low volume, multicolor topographic products. It significantly enhances the existing reproduction equipment with a quick-response color capability. The various DTSS-L topographic products will support mission planning, decision making, and combat operations within the time frames required for the full spectrum of future battles.

The DTSS-L will use CTIS software version 7.0. CTIS is a combination of commercial-off-the-shelf (COTS) and Government-furnished equipment (GFE) software tools for digital topography. Other DTSS variants include the DTSS-High Volume Map Production (HVMP), DTSS-Survey (DTSS-S), DTSS-Deployable (DTSS-D), and the DTSS-Base (DTSS-B).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or

potentially significant military application. Other requests for this document must be referred to  
Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- DTSS-QRMP

**Reference** (Clark et al., 1997):

Clark, D. R., Beran, G. B., Brooks, C., Karwowski, C., Swiderski, W. J., Tierney, R., & James Paige.  
(1997). System Evaluation Report (SER) for the Digital Topographic Support System/Quick Response  
Multicolor Printer (DTSS/Qrmp) in the Lightweight Multipurpose Shelter (Lms) AN/Tyq-67(V)1 Product  
U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-  
1458. OPTEC, Alexandria ,VA USAEAC, APG, MD. DTIC ADB232370.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

080200 - Cartography and Aerial Photography

120600 - Computer Hardware

Descriptors:

(U) \*TOPOGRAPHIC MAPS, \*PRINTERS(DATA PROCESSING), TEST AND EVALUATION, DATA  
BASES, TERRAIN, OPERATIONAL EFFECTIVENESS, COLOR DISPLAYS, DIGITAL MAPS

Identifiers:

(U) AN/TYQ-67(V)1, DTSS(DIGITAL TOPOGRAPHIC SUPPORT SYSTEM), QRMP(QUICK RESPONSE  
MULTICOLOR PRINTER), DIGITAL TOPOGRAPHY, LMS(LIGHTWEIGHT MULTIPURPOSE  
SHELTER), HMMM(V) (HIGH MOBILITY MULTIPURPOSE WHEELED VEHICLE)

**System Description:**

The DTSS/QRMP is a system resulting from integrating the functional requirements of the DTSS and the QRMP into two LMSs mounted on two High Mobility Multipurpose Wheeled Vehicle-Expanded Capacity Vehicles (HMMWV-ECVs). The DTSS/QRMP in this configuration is referred to as the downsized DTSS/QRMP or DTSS/QRMP-Light (DTSSI QRMP-L). The DTSS/QRMP-L system uses recent innovations in technology which enable it to perform the mission of the former DTSS low-rate initial production (LRIP) with increased speed and efficiency and also to perform the mission of the QRMP. The DTSS/QRMP-L will produce automated terrain analysis products and digital topographic data to support the ABCS. It will receive, reformat, create, store, retrieve, update, manipulate, and use digital terrain data to produce terrain analysis products; it will also produce quick turnaround, low-volume, multicolor topographic products.

The DTSS/QRMP-L provides computer-generated terrain analysis information to support battlefield operations at division, corps, and EAC. The major inputs to this system are digital terrain data produced by the Defense Mapping Agency including topographical data regarding slope, vegetation, soil, drainage, transportation, obstacles, and buildings as well as cultural information. These inputs come from direct digital sources such as files on hard disk, compact-disk-read-only memory (CD-ROM), digital audio tape (DAT), and optical disks. Scanning of hardcopy originals can also create digital files. Output capabilities include the processing of data into usable spectral imagery products from storage, retrieval, and replacement of the data file, and the production of multiple copies of graphic and nongraphic battlefield terrain products.

The DTSS/QRMP-L hardware consists of three segments. Two LMS mounted on two HMMWV-ECVs and modified to include equipment racks, environmental control units (ECUs), venting and ducting, lighting, shock-mount skids, and power and signal entry panels comprise the shelter/environment segment (SES). Each LMS is fitted with a signal entry panel, fiber-optic local area network (LAN), single and dual port fiber-optic medium attachment units, and an IEEE-802.3 thin LAN. The workstation and the portable computer unit which are installed in each LMS have internal tactical communications interface modules which together with the laser printer, a Strategic Tactical Secure Voice Terminal, and an STU III phone comprise the communications interface segment (CIS). Image and graphic processing, printing, copying, and scanning support is provided by the processing segment (PS), which consists of one workstation using one common hardware and software version 2 (CHS2) processor [containing a 4.2 GB removable hard disk, a 1.3 GB magneto-optical drive, a 3.5-inch floppy drive, a 4-mm digital audio tape drive, and a

CD-ROM drive]. Peripheral devices include a large format scanner, two large format plotters in each IMS, an 8-mm cartridge tape system, a CD recorder, a laser printer, and a 60 OB disk array. The mission and function of the DTSS/QRMP-L are to provide automated and integrated terrain products which include tactical decision aids, terrain intelligence, digital map products, and hardcopy map products.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- FBCB2

**Reference** (Cammarata and Mackenzie, 2001):

Cammarata, R., & Mackenzie, M. (2001). System Assessment (SA) for the Force XXI Battle Command Brigade and Below (FBCB2): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. AEC, APG, MD. DTIC ADB267741.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

250500 - Command, Control and Communications Systems

120700 - Computer Systems

150100 - Military Forces and Organizations

Descriptors:

(U) \*COMBAT EFFECTIVENESS, \*INFORMATION SYSTEMS, \*RELIABILITY, \*COMMAND AND CONTROL SYSTEMS, \*TACTICAL DATA SYSTEMS, VIBRATION, WARFARE, REAL TIME, ARMY TRAINING, BRIGADE LEVEL ORGANIZATIONS, MILITARY VEHICLES, VULNERABILITY, OPERATIONAL EFFECTIVENESS, SYSTEMS ANALYSIS, MILITARY FORCE LEVELS, BATTLES, MILITARY TACTICS, SITUATIONAL AWARENESS

Identifiers:

(U) \*DIGITIZATION, BATTLE COMMAND, TEMPERATURE TESTING, VIBRATION TESTING, VOLTAGE VARIATION, FBCB2(FORCE 21 BATTLE COMMAND BRIGADE AND BELOW), FORCE XXI, LRIP(LOW RATE INITIAL PRODUCTION)

**System Description:**

The FBCB2 is a digital, battle command information system that provides commanders, leaders, and soldiers with integrated, on-the-move, near-real-time battle command information and situational awareness from brigade to platoon level across all battlefield functional areas (BFA). The FBCB2 makes use of a mix of stand-alone, commercial off-the-shelf (COTS), or militarized components. The hardware consists of ruggedized or militarized FBCB2 computers, keyboards, displays, and mounting kits. The FBCB2 uses COTS software and components from the Defense Information Infrastructure (DII) Common Operating Environment (COE). The FBCB2 also uses the Army Technical Architecture (ATA) compliant TI for information distribution, and interfaces with other battlefield systems using ATA-compliant and emerging joint technical architecture (JTA) technologies.

**Hardware.** FBCB2 V4 hardware was used during the RDT2. The primary improvement from V3 was the use of an improved CPU processor designed to generate less internal heat. Excess CPU heat was a primary cause of failures during the LUT1. To demonstrate the improvement in reliability that could be obtained by elimination of excess internal heat, the RDTI used Applique V3s modified with a "Peltier" device. The V4 hardware was redesigned to achieve the same result through changes to the internal electronics. In particular, the redesign reduced heat output from the 40 watts generated by the V3 to 8 watts generated by the V4. Also, the hard drive was repositioned closer to the outside of the casing which also served as a heat sink.

**Software.** The RDT2 used FBCB2 v3.3.2 software. This is an upgrade from the version of software (v2.1) used during the LUTI and RDTI.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- FBCB2/BFT

**Reference** (Martin et al., 2004):

Martin, C., Wells, J., Barker, J., Halke, W., Rivera, E., Morel, P., Pribilski, R., Watt, E., & Welsh, M. (2004). System Evaluation Report (SER) for the Force XXI Battle Command Brigade and Below/Blue Force Tracking (FBCB2/BFT) (U): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report Classified SECRET. Citation is Unclassified. Report #: 42098974.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

**System Description:**

(U) (Description from unclassified report) The FBCB2 is a battle command information system which is supported by existing and emerging communications, sensors, and electrical power sources. It is a component of the Army Battle Command System (ABCS) and will be used to provide situational awareness (SA), Command and Control (C2) and weather information to organizations at Brigade (BDE) and below. FBCB2 is a system of systems consisting of organic, attached, direct and general support units, and elements which will provide computerized networking throughout the BDE organization with links to higher echelons within the ABCS. FBCB2 will be installed in numerous vehicles and weapon platforms and will provide integration of the data and information generation and processing capabilities of individual soldiers as well as weapons, sensors, and support platforms. As a component of ABCS, it will interoperate with and exchange data and information with other Army, Service, and Joint Battlefield Automated Systems (BAS) in compliance with the Global Command and Control Systems (GCCS) mandates. Major components of the FBCB2 are the Control Display Units (CDU), detachable keyboards, position entry devices, Central Processing Units (CPU), and installation kits tailored to the various individual host platforms.

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- GCCS-A

**Reference** (Parker et al., 2006):

Parker, C., Dixon, H. L., Metcalf, K., & Carr, R. (2006). System Assessment (SA) for the Produced in Support of Continuous Evaluation of the Global Combat Support System - Army (GCSS-Army) (GCSS-a): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB323974.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:  
150300 - Defense Systems  
190500 - Fire Control and Bombing Systems

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*GLOBAL, \*COMBAT SUPPORT, \*WEAPON SYSTEMS, TEST AND EVALUATION, LOGISTICS MANAGEMENT, SYSTEMS ANALYSIS, LIFE CYCLE MANAGEMENT, RISK ANALYSIS

Identifiers:

(U) \*GCSS(GLOBAL COMBAT SUPPORT SYSTEMS)

**System Description:**

High Level Description. To ensure the tactical logistics functionality of the GCSS-Army Capabilities Development Document (CDD), the program is implemented as part of the Single Army Logistics Enterprise (SALE). The SALE defined three distinct, but highly integrated components to achieve an integrated Army logistics environment:

- National Level functionality to be accomplished through the existing ERP program, Logistics Modernization Program (LMP). Project Director (PD) LMP was transitioned to PM SALE, March 2006.
- Field/Tactical Level functionality represented by GCSS-Army (F/T).
- SALE Hub represented by GCSS-Army (PLM+).

a. The GCSS-Army acquisition program is responsible to implement the GCSS-Army (F/T) and GCSS-Army (PLM+) components. GCSS-Army (PLM+) will initially provide interfaces from GCSS-Army to LMP and other external trading partners, and manage customer and vendor master data for GCSS-Army and LMP. The Army's long term objective is for GCSS-Army (PLM+) to be the technical enabler to manage master data common to each of the SALE components. It will facilitate seamless integration between national and tactical components of SALE, and implement all interfaces to management systems external to the SALE architecture.

b. The overall operational objective of GCSS-Army is to establish a Web-based capability so users can manage logistics processes and gain access to information and exchange operational data in other personnel, legal, religious, medical, finance, transportation, training, unit administration, and other CSS functional areas. It will integrate enterprise information and provide all echelons access to critical CSS information.

c. GCSS-Army will share data with joint information systems to allow for the mobilization, deployment, employment, sustainment, and redeployment of Army Forces and joint forces. GCSS-Army's updated business processes, software, integrated data environment, and near realtime data are key information enablers for the Total Army. These enablers will provide functional CSS information and CSS field services management from the Army's tactical and operational levels. GCSS-Army will allow staffs and commanders to support force commanders whether in garrison or during military operations by providing essential operational capabilities including materiel management, maintenance management, property accountability operations, and information obtained from non-logistics domain systems. GCSS-Army will provide a single maneuver sustainment picture through integration of CSS information. The objective operational capabilities of GCSS-Army include:

- A modernized integrated materiel management capability that integrates supply, property, and ammunition management in all Tables of Organization and Equipment (TOE) and selected Tables of Distribution and Allowances (TDA) organizations.
- A modernized maintenance capability that integrates maintenance operations (ground, aviation, missile, medical, and water equipment, etc.) at all field levels of maintenance.
- A modernized supply property capability that integrates supply operations and property accountability in all units.
- Identification and integration of other Army CSS, other Services, combatant commanders, and National Command Authority (NCA) requirements.
- A modernized field level supply support activity (SSA) capability that integrates the supply management and operations at supply support activities and their attendant storage sites.
- A management (MGT) capability that integrates information from multifunctional CSS data sources and allows for data exchange with other external Automated Information System (AIS) requirements into the Army enterprise.
- Forward maintenance support team, contact team, and equipment recovery team operations.
- Individual maintenance/supply personnel, combined GCSS-Army Electronic Technical Manual (ETM)/Integrated Electronic Technical Manual (IETM)/Test Measurement Diagnostic Equipment (TMDE) device, and checklists such as the POL safety checklist in Army Field Manuals.

1.3.2 Key Features and Subsystems. GCSS-Army will utilize an enterprise-wide COTS solution. An ERP package will serve as the backbone system providing common administrative and management

processes across logistical functions. Processes will be engineered to adapt to the ERP functionality and reengineered whenever practical. Additional functional requirements may be satisfied by a combination of additional COTS applications, existing Government Offthe- Shelf (GOTS) software, and specific extensions to the ERP package. Every effort will be made to minimize custom coding.

The SAP ERP modules, which include a shared data environment, will be interoperable. The end result will be a near real-time Army logistics system, except in mobile applications. More specifically, when a business transaction such as an order (requisition) occurs, the entry into the system will immediately affect all related business processes (that is, inventory balances, financial reporting, etc.).

GCSS-Army will reside on COTS computer equipment. The databases and processes of the application programs will support system operation in a shared data environment that incorporates certified common data. When communication connectivity is available, such as in a garrison environment, GCSS-Army operates in a Web-based environment with shared data readily available to those authorized access regardless of where the data are created or stored. Standalone operations will be supported by SAP products.

a. GCSS-Army (FIT). GCSS-Army (F/T) will provide the Army's CS/CSS Warfighter with a seamless flow of timely, accurate, accessible and secure information that gives combat forces a decisive edge. GCSS-Army (F/T) will implement best business practices to streamline supply operations, maintenance operations, property accountability, and logistics management and integration procedures in support of the Future Force transition path of the Army Campaign Plan. GCSS-Army (F/T) will:

- Provide the commander on the battlefield with a logistics common operating picture to support decisions that will affect the outcome of combat operations, combat power, and planning for future operations.
- Be Web-based, in accordance with Department of Defense Reform Initiative Directive 54 (DRID-54) and comply with the Data Sharing Directive (8320.2).
- Make information visible, accessible, and understandable to users, and provide the Warfighter and sustaining base CSS elements a responsive and efficient capability to rapidly anticipate, allocate, and synchronize the flow of resources, services, and information among sustaining base elements and supported units at the strategic, operational, and tactical force levels.
- Provide joint interoperability spanning the logistics functional areas of transportation, supply, maintenance, personnel, medical, finance, and engineering through a fused, integrated, Web-based environment in support of the Warfighter and sustaining base.
- Comply with mandates of the DoD Information Technology (IT) Standard Registry (DISR).
- Use a standard Graphical User Interface (GUI) capability, which will leverage Soldiers' experiences with commercial software and reduce training requirements for operators, system administrators, and AIS maintenance personnel.

b. GCSS-Army (PLM+). GCSS-Army (PLM+) refers to the interface hub that will seamlessly pass information to other ERP and non-ERP systems. The GCSS-Army (PLM+) is the critical element in achieving the Army's objectives of modernizing logistics business processes in an integrated ERP environment. The two primary technology enabling components of GCSS-Army (PLM+) are SAP Product Lifecycle Management (PLM) module (pre-configured views) and the SAP NetWeaver® platform.

Together, these components provide capabilities for interfacing with external constituents and for meeting Army goals of Total Lifecycle Systems Management (TLCSM) and end-to-end (E2E) Customer Service. These components together offer a means to integrate data between GCSS-Army (F/T) and LMP, other logistics systems in the Army Enterprise, and systems throughout the Department of Defense. Web services will be used to avoid point-to-point connections where applicable, and where the receiving system is capable of utilizing those services. All activities requiring particular logistics information will be able to access the data via GCSS-Army (PLM+) in real time using the Web-based environment. Data elements that are maintained in one system, but called something else in another system, will be seamlessly mapped through the GCSS-Army (PLM+) hub using SAP's NetWeaver suite of software. The SAP PLM product provides the following functions:

- Life-cycle data management-delivers a wide range of product information to ensure immediate access to up-to-date data.
- Asset life-cycle management-targets personnel who are in charge of physical assets and equipment from inception to disposal and replacement of assets.
- Life-cycle collaboration and analytics-supports collaborative engineering to communicate information such as documents and product structures across development teams.
- Quality Management-assures and manages the quality of products and assets.
- Environment, Safety & Occupational Health (ESOH)-assists in enhancing business processes to ensure compliance with government regulations and manage risk.

1.3.3 Interfaces. The AIS will exchange data electronically via the area common user systems (ACUS) tactical packet network (TPN); circuit switch networks; wireless networks (Army standard if available); satellite communications (SATCOM), including the Virtual Small Aperture Terminal (VSAT); combat-service-support automated information system interface (CAISI); defense information switched network (DISN); foreign and domestic common user installation telephone network (CUITN) services; and the strategic communications capabilities of the Warfighter information network (WIN). Backup courier services will be used only as necessary to transfer data on removable storage media. GCSS-Army will be operated in all environments, from the operator's perspective, to include peace, war or national emergency, as well as stability and support operations (SASO). Figure 1-2 illustrates the proposed system architecture. a. GCSS-Army will support the evolving Future Combat System (FCS) and Future Force (FF) through development and interface of common Enterprise services with Army Battle Command System (ABCS) and emerging Army Command, Control, Communications, Computers and Intelligence (C4I) systems included in the Network Enabled Command Capability (NECC) system architecture. The transfer of CSS information will be automated over tactical, strategic, and commercial data and voice communications systems.

b. GCSS-Army's management capabilities will interface, via a secure guard or storage media (after it has been reviewed to exclude classified data), with the Logistics Common Operating Picture (LCOP) in the near term and evolving Battle Command Sustainment Support System (BCS3) and beyond, by providing the technical CSS data (i.e., quantity, description, location, status) for all needed supplies and services.

c. GCSS-Army will be an interface in support of all U.S. Army supply services. In the area of movement control, it will interface with Transportation Coordinator's Automated Information for Movements System (TC-AIMS II) and Movement Tracking System (MTS).

d. GCSS-Army, as a member of the GCSS Family of Systems (FoS), will feed functional CSS information from the Army's tactical and operational levels to GCSS FoS to support the requirements of The Secretary of Defense, Joint Task Force commanders, Joint Force Land Component Commanders, Combatant Commands (COCOM), departments, staffs, and the Army Campaign Plan (ACP).

e. GCSS-Army will support the Global Information Grid (GIG) by providing joint interoperability spanning the maneuver sustainment logistics functional areas through a fused, integrated, network-centric environment in support of the battle commander and sustaining base.

f. Other joint interfaces include Defense Integrated Military Human Resources System (DIMHRS) and Medical Communications for Combat Casualty Care/Theater Medical Information Program (MC4/TMIP) through the TMIP Interim Theater Database (ITDB). GCSSArmy will provide this information to BCS3. GCSS-Army (PLM+) with technical and functional support from the GCSS-Army (F/T) implementation team, together are developing the interfaces.

g. The SALE end-to-end concept consists of GCSS-Army (F/T), GCSS-Army (PLM+), and LMP. The SALE is not an acquisition program, but rather a set of capabilities that will integrate logistics from "factory to foxhole" (small unit level through the Army's National level). It will work in unison with the DoD Force-centric Logistics Enterprise environment, including industry, Joint Logistics Commands, the Joint Warfighting Communities, and coalition partners. It will support Current and Future Forces and equipment, and will be capable of working concurrently in all environments. When fully implemented, the SALE will provide commanders and logisticians with the common integrated business processes which will support a view of the entire Army logistics value chain from the National level through sustainment base installations to tactical field levels.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- GCSS-A

**Reference** (Parker et al., 2006):

Parker, C., Dixon, H. L., Metcalf, K., & Carr, R. (2006). System Evaluation Report (SER) for the Global Combat Support System-Army (GCSS-Army): U.S. Army Test and Evaluation Command, (CSTE-AEC-

ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 70259221. DTIC ADB323974.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

150300 - Defense Systems

190500 - Fire Control and Bombing Systems

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*GLOBAL, \*COMBAT SUPPORT, \*WEAPON SYSTEMS, TEST AND EVALUATION, LOGISTICS MANAGEMENT, SYSTEMS ANALYSIS, LIFE CYCLE MANAGEMENT, RISK ANALYSIS

Identifiers:

(U) \*GCSS(GLOBAL COMBAT SUPPORT SYSTEMS)

**System Description:**

**1. High Level Description.** To ensure the tactical logistics functionality of the GCSS-Army Capabilities Development Document (CDD), the program is implemented as part of the Single Army Logistics Enterprise (SALE). The SALE defined three distinct, but highly integrated components to achieve an integrated Army logistics environment: • National Level functionality to be accomplished through the existing ERP program, Logistics Modernization Program (LMP). Project Director (PD) LMP was transitioned to PM SALE, March 2006. • Field/Tactical Level functionality represented by GCSS-Army (FIT). • SALE Hub represented by GCSS-Army (PLM+).

**a. The GCSS-Army acquisition program** is responsible to implement the GCSS-Army (FIT) and GCSS-Army (PLM+) components. GCSS-Army (PLM+) will initially provide interfaces from GCSS-Army to LMP and other external trading partners, and manage customer and vendor master data for GCSS-Army and LMP. The Army's long term objective is for GCSS-Army (PLM+) to be the technical enabler to manage master data common to each of the SALE components. It will facilitate seamless integration between national and tactical components of SALE, and implement all interfaces to management systems external to the SALE architecture.

**b. The overall operational objective of GCSS-Army** is to establish a Web-based capability so users can manage logistics processes and gain access to information and exchange operational data in other personnel, legal, religious, medical, finance, transportation, training, unit administration, and other CSS functional areas. It will integrate enterprise information and provide all echelons access to critical CSS information.

**c. GCSS-Army** will share data with joint information systems to allow for the mobilization, deployment, employment, sustainment, and redeployment of Army Forces and joint forces. GCSS-Army's updated business processes, software, integrated data environment, and near realtime data are key information enablers for the Total Army. These enablers will provide functional CSS information and CSS field services management from the Army's tactical and operational levels. GCSS-Army will allow staffs and commanders to support force commanders whether in garrison or during military operations by providing essential operational capabilities including materiel management, maintenance management, property accountability operations, and information obtained from non-logistics domain systems. GCSS-Army will provide a single maneuver sustainment picture through integration of CSS information. The objective operational capabilities of GCSS-Army include:

- **A modernized integrated materiel management capability** that integrates supply, property, and ammunition management in all Tables of Organization and Equipment (TOE) and selected Tables of Distribution and Allowances (TDA) organizations.

- **A modernized maintenance capability** that integrates maintenance operations (ground, aviation, missile, medical, and water equipment, etc.) at all field levels of maintenance.

- **A modernized supply property capability** that integrates supply operations and property accountability in all units.

- Identification and integration of other Army CSS, other Services, combatant commanders, and National Command Authority (NCA) requirements.

- **A modernized field level supply support activity (SSA) capability** that integrates the supply management and operations at supply support activities and their attendant storage sites.

- **A management (MGT) capability** that integrates information from multifunctional CSS data sources and allows for data exchange with other external Automated Information System (AIS) requirements into the Army enterprise.

- **Forward maintenance support team**, contact team, and equipment recovery team operations.

- **Individual maintenance/supply personnel**, combined GCSS-Army Electronic Technical Manual (ETM)/Integrated Electronic Technical Manual (IETM)/Test Measurement Diagnostic Equipment (TMDE) device, and checklists such as the POL safety checklist in Army Field Manuals.

**2. Key Features and Subsystems.** GCSS-Army will utilize an enterprise-wide COTS solution. An ERP package will serve as the backbone system providing common administrative and management processes across logistical functions. Processes will be engineered to adapt to the ERP functionality and reengineered whenever practical. Additional functional requirements may be satisfied by a combination of additional COTS applications, existing Government Offthe- Shelf (GOTS) software, and specific extensions to the ERP package. Every effort will be made to minimize custom coding. The SAP ERP modules, which include a shared data environment, will be interoperable. The end result will be a near real-time Army logistics system, except in mobile applications. More specifically, when a business transaction such as an order (requisition) occurs, the entry into the system will immediately affect all related business processes (that is, inventory balances, financial reporting, etc.). GCSS-Army will reside on COTS computer equipment. The databases and processes of the application programs will support system operation in a shared data environment that incorporates certified common data. When communication connectivity is available, such as in a garrison environment, GCSS-Army operates in a Web-based environment with shared data readily available to those authorized access regardless of where the data are created or stored. Standalone operations will be supported by SAP products.

**a. GCSS-Army (F/T).** GCSS-Army (FIT) will provide the Army's CS/CSS Warfighter with a seamless flow of timely, accurate, accessible and secure information that gives combat forces a decisive edge. GCSS-Army (FIT) will implement best business practices to streamline supply operations, maintenance operations, property accountability, and logistics management and integration procedures in support of the Future Force transition path of the Army Campaign Plan. GCSS-Army (F/T) will:

- **Provide the commander** on the battlefield with a logistics common operating picture to support decisions that will affect the outcome of combat operations, combat power, and planning for future operations.

- **Be Web-based**, in accordance with Department of Defense Reform Initiative Directive 54 (DRID-54) and comply with the Data Sharing Directive (8320.2).

- **Make information visible**, accessible, and understandable to users, and provide the Warfighter and sustaining base CSS elements a responsive and efficient capability to rapidly anticipate, allocate, and synchronize the flow of resources, services, and information among sustaining base elements and supported units at the strategic, operational, and tactical force levels.

- **Provide joint interoperability** spanning the logistics functional areas of transportation, supply, maintenance, personnel, medical, finance, and engineering through a fused, integrated, Web-based environment in support of the Warfighter and sustaining base.

- **Comply with mandates of the DoD Information Technology (IT) Standard Registry (DISR).**

- **Use a standard Graphical User Interface (GUI) capability**, which will leverage Soldiers' experiences with commercial software and reduce training requirements for operators, system administrators, and AIS maintenance personnel.

**b. GCSS-Army (PLM+).** GCSS-Army (PLM+) refers to the interface hub that will seamlessly pass information to other ERP and non-ERP systems. The GCSS-Army (PLM+) is the critical element in achieving the Army's objectives of modernizing logistics business processes in an integrated ERP environment. The two primary technology enabling components of GCSS-Army (PLM+) are SAP Product Lifecycle Management (PLM) module (pre-configured views) and the SAP NetWeaver® platform. Together, these components provide capabilities for interfacing with external constituents and for meeting Army goals of Total Lifecycle Systems Management (TLCSM) and end-to-end (E2E) Customer Service. These components together offer a means to integrate data between GCSS-Army (FIT) and LMP, other logistics systems in the Army Enterprise, and systems throughout the Department of Defense. Web services will be used to avoid point-to-point connections where applicable, and where the receiving system is capable of utilizing those services. All activities requiring particular logistics information will be able to access the data via GCSS-Army (PLM+) in real time using the Web-based environment. Data elements that are maintained in one system, but called something else in another system, will be seamlessly mapped through the GCSS-Army (PLM+) hub using SAP's NetWeaver suite of software. The SAP PLM product provides the following functions:

- **Life-cycle data management**-delivers a wide range of product information to ensure immediate access to up-to-date data.
  - **Asset life-cycle management**-targets personnel who are in charge of physical assets and equipment from inception to disposal and replacement of assets.
  - **Life-cycle collaboration** and analytics-supports collaborative engineering to communicate information such as documents and product structures across development teams.
  - **Quality Management**-assures and manages the quality of products and assets.
  - **Environment, Safety & Occupational Health (ESOH)**-assists in enhancing business processes to ensure compliance with government regulations and manage risk.
- 3. Interfaces.** The AIS will exchange data electronically via the area common user systems (ACUS) tactical packet network (TPN); circuit switch networks; wireless networks (Army standard if available); satellite communications (SATCOM), including the Virtual Small Aperture Terminal (VSAT); combat-service-support automated information system interface (CAISR); defense information switched network (DISN); foreign and domestic common user installation telephone network (CUITN) services; and the strategic communications capabilities of the Warfighter information network (WIN). Backup courier services will be used only as necessary to transfer data on removable storage media. GCSS-Army will be operated in all environments, from the operator's perspective, to include peace, war or national emergency, as well as stability and support operations (SASO). Figure 1-2 illustrates the proposed system architecture.
- a. GCSS-Army** will support the evolving Future Combat System (FCS) and Future Force (FF) through development and interface of common Enterprise services with Army Battle Command System (ABCS) and emerging Army Command, Control, Communications, Computers and Intelligence (C4I) systems included in the Network Enabled Command Capability (NECC) system architecture. The transfer of CSS information will be automated over tactical, strategic, and commercial data and voice communications systems.
- b. GCSS-Army's management capabilities** will interface, via a secure guard or storage media (after it has been reviewed to exclude classified data), with the Logistics Common Operating Picture (LCOP) in the near term and evolving Battle Command Sustainment Support System (BCS3) and beyond, by providing the technical CSS data (i.e., quantity, description, location, status) for all needed supplies and services.
- c. GCSS-Army** will be an interface in support of all U.S. Army supply services. In the area of movement control, it will interface with Transportation Coordinator's Automated Information for Movements System (TC-AIMS II) and Movement Tracking System (MTS).
- d. GCSS-Army**, as a member of the GCSS Family of Systems (FoS), will feed functional CSS information from the Army's tactical and operational levels to GCSS FoS to support the requirements of The Secretary of Defense, Joint Task Force commanders, Joint Force Land Component Commanders, Combatant Commands (COCOM), departments, staffs, and the Army Campaign Plan (ACP).
- e. GCSS-Army** will support the Global Information Grid (GIG) by providing joint interoperability spanning the maneuver sustainment logistics functional areas through a fused, integrated, network-centric environment in support of the battle commander and sustaining base.
- f. Other joint interfaces** include Defense Integrated Military Human Resources System (DIMHRS) and Medical Communications for Combat Casualty Care/Theater Medical Information Program (MC4/TMIP) through the TMIP Interim Theater Database (ITDB). GCSSArmy will provide this information to BCS3. GCSS-Army (pLM+) with technical and functional support from the GCSS-Army (FIT) implementation team, together are developing the interfaces.
- g. The SALE end-to-end concept** consists of GCSS-Army (FIT), GCSS-Army (PLM+), and LMP. The SALE is not an acquisition program, but rather a set of capabilities that will integrate logistics from "factory to foxhole" (small unit level through the Army's National level). It will work in unison with the DoD Force-centric Logistics Enterprise environment, including industry, Joint Logistics Commands, the Joint Warfighting Communities, and coalition partners. It will support Current and Future Forces and equipment, and will be capable of working concurrently in all environments. When fully implemented, the SALE will provide commanders and logisticians with the common integrated business processes which will support a view of the entire Army logistics value chain from the National level through sustainment base installations to tactical field levels.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or

potentially significant military application. Other requests for this document must be referred to  
Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- ISYSCON

**Reference** (Brady et al., 1999):

Brady, W. H., Meirose, S., Lopolito, A., Wong, N., & Miller, W. (1999). System Evaluation Report (SER) for the Milestone III Decision for the Integrated System (ISYSCON): U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 90137061 / SER 01-99. DTIC ADB241576.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

250500 - Command, Control and Communications Systems

120700 - Computer Systems

Descriptors:

(U) \*INTEGRATED SYSTEMS, \*WIDE AREA NETWORKS, \*TACTICAL COMMUNICATIONS, SIGNAL PROCESSING, SOFTWARE ENGINEERING, COMMAND CONTROL COMMUNICATIONS, DISTRIBUTED DATA PROCESSING, SURVIVABILITY, INTEROPERABILITY, PERFORMANCE(ENGINEERING), OPERATIONAL EFFECTIVENESS, SYSTEMS ANALYSIS, COMPUTER PROGRAM RELIABILITY, BATTLE MANAGEMENT

Identifiers:

(U) ISYSCON(INTEGRATED SYSTEM CONTROL)

**System Description:**

**1.4.1 Key Features.** The ISYSCON objective system is intended to provide the necessary tools to perform the communications and automation management process by automating essential functions. The following paragraphs describe the key features of the ISYSCON.

**1.4.1.1 Communications Management Functions.** Communications management functions include BSM, NPE, WAN control, and management for identified communications units, SIGC2, and COMSEC key management. WAN management is the transmission, circuit, and packet switch networks that are included in the tactical communication systems.

**1.4.1.2 Automated Interface.** The ISYSCON interoperates through automated interface with existing and emerging Army communication systems control facilities, namely Communications System Control Element (CSCE), control facility for the Joint Tactical Information Distribution System, Net Control Station (NCS)-Enhanced Position Location Reporting System (EPLRS), and with other ISYSCONs.

**1.4.1.3 Direct Automated Interface.** The ISYSCON interoperates through a direct automated interface TPN with four of the five Army Battlefield Control Systems (ABCSS) nodes (Maneuver Control System (MCS), All Source Analysis System (ASAS), Combat Service Support Control System (CSSCS), and Air Missile Defense Work Station (AMDWS)). Communications management support to the Advanced Field Artillery Tactical Data System (AFATDS) is provided through the MCS.

**1.4.1.4 COMSEC Key Management.** The ISYSCON integrates the AKMS automatic COMSEC engineering software functionality and interfaces with AKMS workstations.

**1.4.2 Hardware.** The ISYSCON Version 1 hardware consists of six CHS-2 workstations, two of which act as servers mounted in the S250-E shelter, and four workstations in two Standardized, Integrated Command Post Systems (SICPS) tents. The ISYSCON is capable of operating on independent alternating current (AC) power source or direct current (DC) power furnished by the prime mover. Each workstation consists of a processor unit, monitor, and keyboard with built-in trackball. Each suite also consists of a ruggedized printer mounted in the shelter, a second ruggedized printer, LSD, and the network management center (NMC) housed in the two SICPS tents. The support-radio vehicle has a high frequency (HF) radio, EPLRS, and Single Channel Ground and Airborne Radio System (SINCGARS). The entire suite is transported by two HMMWVs, one with the S250-E shelter pulling a 10-kilowatt PU753 generator mounted on an M116A2 trailer and the support-radio HMMWV pulling the M101A3 cargo trailer.

**1.4.3 Software.**

**1.4.3.1 Workstation Commercial Software.** Workstation commercial software consists of CHS-2 application software products that provide a Portable Operating System Interface Standard compliant operating system and other COTS support software such as spreadsheet, electronic mail, word processing, and presentation graphics.

**1.4.3.2 ISYSCON Application Software.** The ISYSCON programs use existing nondevelopmental item (NDI) application software, both Government off-the-shelf (GOTS) and COTS.

**1.4.4 Interfaces.** The ISYSCON staff should be able to collect information by interfacing with the various communication networks in the field, then process and disseminate this timely, integrated information to all customers.

**1.4.4.1 Internal Interfaces.** Communication among the ISYSCON internal functional areas and the resident software is in accordance with the ISYSCON Object Class Specification Document and Event Trace Document.

**1.4.4.2 External Interfaces.** The ISYSCON provides and obtains information to and from the following objective external interfaces: node center (NC), large extension node (LEN), and radio access unit (RAU) through the MSE circuit switch network and the MSE packet switch network. All external interfaces with the ISYSCON are summarized in the system specifications for ISYSCON.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- ISYSCON

**Reference** (Harris and Manyen, 2000):

Harris, M. F., & Manyen, F. (2000). System Assessment (SA) for the Material Release Decision for the Integrated System Control (ISYSCON): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. OTC, Ft. Hood, TX. Report # 03468339.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)  
From DTIC ADB298916:

Fields and Groups:

120500 - Computer Programming and Software

120700 - Computer Systems

Descriptors:

(U) \*SOFTWARE ENGINEERING, \*INTEGRATED SYSTEMS, \*SYSTEMS ANALYSIS, CONTROL SYSTEMS, ACQUISITION, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, CONFIGURATIONS

**System Description:**

(From DTIC ADB298916) The ISYSCON (V)1/(V)2 provides users with an automated capability to plan, engineer, configure, manage, and report the status of the EAC tactical communications and data distribution networks to include the required interface(s) of EAC tactical communications and data distribution networks to other equipment.

**Network Planning and Engineering.** Signal officers and staff use ISYSCON (V)1/(V)2 to plan and engineer the communications networks for EAC. Given improved new equipment training (NET) and more hands-on training, the signal officers and staff should be able to accomplish network planning and engineering within the required time limits.

**Network Monitoring.** The ISYSCON (V)1/(V)2 primarily utilizes the Hewlett Packard Open View application to provide an automated capability to accurately display the status of System Network Management Protocol (SNMP)-enabled devices and network devices within a network topology.

**Network Fault Isolation/Troubleshooting.** The ISYSCON (V)1/(V)2 has more than 30 different technical manuals (TMs), user manuals, technical bulletins, and commercial off-the-shelf (COTS) documentation manuals to address operational and maintenance of all of the integrated hardware and software components of the system.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- ISYSCON

**Reference** (Mastromanolis et al., 2004):

Mastromanolis, N., Yu, K., Wong, N., Kirk, E., Powell, M., Markham, W., Reynolds, D., Foley, J., Davis, T., Ptiscof, M., Markham, W., & Rink, W. (2004). System Assessment (SA) for the Integrated System Control (ISYSCON) (V)1/(V)2 Block 3 Software Increment 2.0 U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. DTIC ADB298916.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

120500 - Computer Programming and Software

120700 - Computer Systems

Descriptors:

(U) \*SOFTWARE ENGINEERING, \*INTEGRATED SYSTEMS, \*SYSTEMS ANALYSIS, CONTROL SYSTEMS, ACQUISITION, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, CONFIGURATIONS

**System Description:**

The ISYSCON (V)1/(V)2 provides users with an automated capability to plan, engineer, configure, manage, and report the status of the EAC tactical communications and data distribution networks to include the required interface(s) of EAC tactical communications and data distribution networks to other equipment.

**Network Planning and Engineering.** Signal officers and staff use ISYSCON (V)1/(V)2 to plan and engineer the communications networks for EAC. Given improved new equipment training (NET) and more hands-on training, the signal officers and staff should be able to accomplish network planning and engineering within the required time limits.

**Network Monitoring.** The ISYSCON (V)1/(V)2 primarily utilizes the Hewlett Packard Open View application to provide an automated capability to accurately display the status of System Network Management Protocol (SNMP)-enabled devices and network devices within a network topology.

**Network Fault Isolation/Troubleshooting.** The ISYSCON (V)1/(V)2 has more than 30 different technical manuals (TMs), user manuals, technical bulletins, and commercial off-the shelf (COTS) documentation manuals to address operational and maintenance of all of the integrated hardware and software components of the system.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- JNTC/CPOF

**Reference** (Graham et al., 2005):

Graham, G., Powell, M., Prowell, K., Tinnon, J., Bruder, B., Clift, J., Garfinkel, G., Jones, M., Stewart, J., Smith-Hicks, A., James, K., Pliscof, M., Manasco, C., Card, R., Glossin, R., & Harry, P. (2005). System Assessment (SA) for the Joint Network Transport Capability (JNTC) (Including the Command Post of the

Future (CPOF): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458. DTIC ADB307280.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)  
Fields and Groups:

250500 - Command, Control and Communications Systems

150600 - Military Operations, Strategy and Tactics

Descriptors:

(U) \*COMMAND CONTROL COMMUNICATIONS, \*COMMUNICATIONS NETWORKS, \*MILITARY  
CAPABILITIES, \*SYSTEMS ANALYSIS, \*RISK ANALYSIS, \*TECHNOLOGY ASSESSMENT,  
OPERATIONAL EFFECTIVENESS, TRANSPORT, SATELLITE COMMUNICATIONS, DIGITAL  
COMMUNICATIONS, ELECTROMAGNETISM, ELECTROSTATICS, ARMY PROCUREMENT,  
INFORMATION ASSURANCE

Identifiers:

(U) \*JNTC(JOINT NETWORK TRANSPORT CAPABILITY), JNN(JOINT NETWORK NODE), SPIRAL  
ACQUISITION, OIF(OPERATION IRAQI FREEDOM)

**System Description:**

**1.3.1 The JNTC Federation of Systems.** JNTC represents an effort to bring full digital communications capability to a tactical Army division, starting with the 3ID. In totality, JNTC encompasses approximately 50 systems.

**1.3.2 JNN-N.** JNN-N is composed of the JNN, the Ku Trailer, the Unit HUB, and the Battalion (BN) Command Post (CP) Node.

**1.3.2.1 JNN.** JNN is a mounted shelter containing a Commercial Off-The-Shelf (COTS) switching and routing center located at the Unit of Employment (UEX) and Unit of Action (UA) echelons. Its purpose is to provide both SIPR and NIPR connectivity to Defense Information Systems Network (DISN) and multiple interfaces for transport systems (LOS and BLOS).

**1.3.2.2 Ku Trailer.** The purpose of the Ku-band trailer is to provide Satellite Communications (SATCOM) capability. Mounted on the trailer are a 2.4-meter auto-erect, acquire, and tracking antenna, a 400-watt (W) high power amplifier, a generator, a universal power supply and associated communications devices (e.g., modems, up-converter).

**1.3.2.3 Teleport-Surrogate (Unit HUB).** Each Unit HUB (figure 1-2) unit consists of three trucks: the Baseband, Time Division Multiple Access (TDMA) SATCOM, and Frequency Division Multiple Access (FDMA) SATCOM trucks. Each SATCOM truck is capable of up to 40 megabits per second (Mbps) of full duplex traffic and contains approximately 160 Rack Units (Ru) (4 each, 6 feet high, 19 inch racks) of equipment. A 3.7-meter auto-erect, acquire, and tracking satellite dish and a 40-kilowatt (kW) generator/dual 6 kilovoltampere (KVA) Uninterruptible Power Supply (UPS) are also included on each SATCOM truck. The baseband truck contains 2 Promina 800s (multiplexers), a Private Branch Exchange (PBX) switch, CISCO routers and switches, Information Assurance components, a server farm, Crypto equipment [22 KIVs, 4 TACLANes (Tactical FASTLANE® KG-175)], 200 Ru (5 ea, 6 feet high, 19 inch racks), and 4 workstations. The Unit HUB is intended to be located in a sanctuary area, usually with available commercial power sources.

**1.3.2.4 Battalion CP Node.** Each BN CP node consists of a Ku trailer and transit cases containing the SATCOM and SIPR electronics.

**1.3.3 Command Post of the Future (CPoF).** The CPoF is an executive-level decision support tool that provides situational awareness and collaborative tools to support decision making. It receives the majority of its data from the Army Battle Command System (ABCS). It consists of a computer with three high resolution screens. CPoF's MAYA Viz CoMotion Application provides a versatile commander's view of geospatial, temporal and other forms of data on one screen. The Oculus Command Sight Application displays a three dimensional map-based view of the area of operations on another screen. The Map Manager Application allows an operator to use the third screen to process imagery and map data for later transfer into either the Commander's View screen or into the Sight Application screen. CPoF's Ventrillo Application provides VoIP connections for verbal collaboration among operators in different locations who simultaneously view the same screen displays.

**1.3.4 Combat Service Support-** Very Small Aperture Terminal (CSS-VSAT). The CSS VSAT initiative is a high priority, Headquarters, Department of the Army (HQDA) G4-specified effort to provide portable, tactical satellite communications to assist with implementing an immediate resolution of shortfalls in

combat logistician information systems communications capabilities. CSS-VSAT is a portable, commercial SATCOM technology that is intended to provide connectivity with the NIPRNET and limited voice for logistics nodes.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- MCS

**Reference** (Stone et al., 1983):

Stone, R. A., Shepherd, J. D., Nott, M. B., Howrey, E. L., Stuart, H. P., Pollard, V. A., Miller, L. J., Turgeon, B. P., Tebo, E. V., Sharp, O. F., Clements, M. A., Jamandre, O. V., & Coppedge, J. A. (1983). Final Report (FR) for the Maneuver Control System (MCS) RCS ATTE-3 FDTE: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. TCATA Test Report FT 465A. OTC Report Number 6868. DTIC ADB071098.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

150600 - Military Operations, Strategy and Tactics

250500 - Command, Control and Communications Systems

Descriptors:

(U) \*Command and control systems, \*Tactical communications, \*Tactical data systems, \*Combat information centers, Formats, Message processing, Data links, Communications networks, Communication terminals, Data displays

Identifiers:

(U) MCS(Maneuver Control Systems), TCS(Tactical Computer System), TCT(Tactical Computer

**System Description:**

The two major components of the MCS are the tactical computer system (TCS) and the tactical computer terminal (TCT).

**Scope and tactical context.** The MCS evaluation was conducted in the Federal Republic of Germany in conjunction with a corps versus corps field training exercise (FTX) from 13 to 22 September 1982. Data were collected in one corps which had two divisions participating in the evaluation: division A, the non-MCS division, was a Continental United States (CONUS) division which had only one TCT; division B, the MCS division, was a forward deployed division equipped down to battalion level with MCS. The test activity had no input into the FTX control or scenario.

**MCS development began in 1975.** Prototype devices with limited capability were deployed to Europe in 1980. They were to be used from corps through battalion to assist in control of operations and to provide baseline equipment for evolutionary development. The United States Army Training and Doctrine Command (TRADOC) Combined Arms Test Activity (TCATA) conducted two prior evaluations of MCS. The first was limited evaluation of the TCT in May 1981, followed QY an evaluation of both the TCT and TCS in September 1981.

This test was conducted to provide data and associated analysis on the operating characteristics and utility of the MCS. The test was conducted during a corps versus corps exercise in the Federal Republic of Germany. Subjective and objective data were collected on the capability of the MCS to support the commander and staff in planning and operations, on the capability of existing communications means to support the MSC, and on the utility of MCS message formats.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to

Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- MCS

**Reference** (Stone et al., 1984):

Stone, R. A., Jr., Nott, M. B., Tebo, R. J., Illing, T. R., Kish, T. R., Eicher, D. J., Lott, J. W., Matthews, K. B., Turgeon, B. P., Eicher, D. J., Tipton, N. T., Hicks, M. E., Stewart, M. F., & Jamandre, O. V. (1984). Final Report (FR) for the Maneuver Control System (MCS) RCS ATTE-3 Evaluation, July 1984: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. TCATA Report # 72558023, Fort Hood, TX. DTIC ADB084795.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

150600 - Military Operations, Strategy and Tactics

250300 - Non-radio Communications

Descriptors:

(U) \*CONTROL SYSTEMS, \*MANEUVERS, DISPLAY SYSTEMS, DIGITAL SYSTEMS, COMMUNICATION EQUIPMENT, AUTOMATION, WEST GERMANY

Identifiers:

(U) MCS(Maneuver Control System), Objective data, AC(Analyst Consoles)

**System Description:**

The current MCS configuration consists of three components: the tactical computer terminal (TCT), the tactical computer system (TCS), and an analyst console (AC).

o The TCS consists of a display, keyboard, and printer with the capability for additional management functions. These functions include data entry, message composition, storage, editing, printing, transmission, reception, automated message routing, graphics production, and limited data base management. A 16-channel communication capability is available.

o The TCT consists of a stand-alone plasma display and keyboard, a microprocessor with limited memory capability, and a two-channel communication capability.

o The AC consists of the display, keyboard, and printer modules and is dependent on the TCS processor to function. The AC can be separated from a TCS to a maximum distance of 100 feet.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- MCS

**Reference** (Stone et al., 1984):

Stone, R. A., Jr., Lott, J., Nott, M., Kish, T., Eicher, D., & Hughart, R. (1984). Final Report (FR) for the Maneuver Control System (MCS) RCS ATTE-3 Evaluation, November 1984: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. TCATA TRADOC COMBINED ARMS TEST ACTIVITY FORT HOOD. TCATA Test Report RS 205. OTC Report Number 6323. DTIC ADB088201.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

050100 - Administration and Management

250500 - Command, Control and Communications Systems

**Descriptors:**

(U) \*Test and evaluation, \*Military operations, \*Systems analysis, \*Command and control systems, Military commanders, Computer communications, Data acquisition, Utilization, Operation, Automation, Military personnel, Data bases, Data management

**Identifiers:**

(U) MCS(Maneuver Control System), Data base management systems

**System Description:**

The MCS began with the development of the tactical computer terminal (TCT) and the tactical computer system (TCS) in 1975. The prototype devices with limited capabilities were deployed to the United States Army, Europe in 1980. They were to be used at corps through battalion level to assist in control of operations and to provide baseline equipment for evolutionary development. Future enhancements to the system will be based on user experience. In February 1981 TRADOC Combined Arms Test Activity (TCATA) was designated as the test organization for the MCS.

This evaluation was conducted to provide data and associated analysis on the operating characteristics and utility of the MCS. The evaluation was conducted during exercise Return of Forces to Germany. Subjective and objective data were collected on the capability of the MCS equipment to support the commander and staff in performance of staff functions. Originator-supplied keywords include: Automation, Command and control, Command post, Communications, Computer system, Data base management system, and Nondevelopmental items.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- MCS ver 6.3.2

**Reference** (James et al., 2003):

James, M., Thompson, P., Kim, E. S., Harris, D., Anderson, W., Whibley, M., & Swiger, A. (2003). System Assessment (SA) for the Maneuver Control System (MCS) Software Version 6.3.2: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB288609.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

**Fields and Groups:**

120700 - Computer Systems

120800 - Computer Systems Management and Standards

250500 - Command, Control and Communications Systems

**Descriptors:**

(U) \*COMPUTER PROGRAMS, \*INFORMATION SYSTEMS, \*COMPUTER ACCESS CONTROL, \*DATA TRANSMISSION SECURITY, MILITARY OPERATIONS, DEPLOYMENT, CONTROL SYSTEMS, OPERATIONAL EFFECTIVENESS, COMMAND AND CONTROL SYSTEMS, TACTICAL DATA SYSTEMS, DECISION SUPPORT SYSTEMS, CLIENT SERVER SYSTEMS, INFORMATION WARFARE

**Identifiers:**

(U) MCS(MANEUVER CONTROL SYSTEM), INFORMATION ASSURANCE, INFORMATION OPERATIONS

**System Description:**

MCS is designed to perform two primary missions:

**a. Situational Understanding:** Provide the Combined Arms Maneuver commander and staff (Battalion (BN) through Corps) the mission critical command and control system. This system will allow them to visualize the battlespace and synchronize the elements of the commander's combat power for successful execution of combat operations.

**b. Execution Information:** Provide the means to communicate both the commander's vision of the operation and the desired outcome. Examples of execution information are planning guidance, commander's intent, concept of operation statements, plans, and orders.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- NOC-V

**Reference** (Alvarez et al., 2005):

Alvarez, D., Rivera, M., Bruder, B., Jones, M., & Lee, J. (2005). System Assessment (SA) for the Network Operation Center - Vehicle (NOC-V): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB306402.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

120700 - Computer Systems

130600 - Surface Transportation and Equipment

250200 - Radio Communications

Descriptors:

(U) \*LOCAL AREA NETWORKS, \*MILITARY VEHICLES, \*SYSTEMS ANALYSIS, TEST AND EVALUATION, OPERATIONAL READINESS, OPERATIONAL EFFECTIVENESS, COMMUNICATIONS NETWORKS

Identifiers:

(U) NOC-V(NETWORK OPERATION CENTER-VEHICLE), SER(SYSTEM EVALUATION REPORT), NWDT(NETWORK WIDE DEVELOPMENTAL TESTING)

**System Description:**

The NOC-V consists of a shelterized network operation center that is transported on an Expanded Capacity Vehicle and a support Heavy High Mobility Multipurpose Vehicle (HMMWV) towing a trailer. It integrates existing capabilities to manage, protect, and support the Tactical Internet (TI) and the Tactical Operation Center (TOC) Local Area Network (LAN) communications network. The NOC-V is organic to the Stryker Brigade Combat Team (SBCT) and contributes to its ability to operate independently. It provides transport for data using routing and existing transmission capabilities. It also supports the capability to handle Secret (threshold) and Sensitive Unclassified Information classification levels for separate battalions, brigade size units, and above (objective). Additionally, the NOC-V can provide an integrated subscriber service capability in accordance with the echelon supported and transmission system availability, through a switching node.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- NOC-V

**Reference** (Alvarez et al., 2006):

Alvarez, D. M., Rivera, M., Stinnette, E., Jones, M., Lee, J., Manasco, C., Miller, M., Fischer, J., Davis, T., Salazar, S., & Powers, A. (2006). System Evaluation Report (SER) for the Network Operation Center -

Vehicle (NOC-V): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458. DTIC ADB316258

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)  
Fields and Groups:

120700 - Computer Systems

250200 - Radio Communications

Descriptors:

(U) \*LOCAL AREA NETWORKS, \*MILITARY VEHICLES, \*SYSTEMS ANALYSIS, SURVIVABILITY,  
OPERATIONAL EFFECTIVENESS, INTERNET, ELECTROMAGNETIC COMPATIBILITY, ARMY  
EQUIPMENT, COMMUNICATIONS NETWORKS, ELECTROMAGNETIC INTERFERENCE, USER  
NEEDS

Identifiers:

(U) NOC-V(NETWORK OPERATION CENTER-VEHICLE), SYSTEM EVALUATION REPORTS,  
UFD(USER FUNCTIONAL DESCRIPTION), ESS(EFFECTIVENESS SUITABILITY AND  
SURVIVABILITY), COI(CRITICAL OPERATIONAL ISSUES), NWDT(NETWORK WIDE  
DEVELOPMENTAL TEST), TACTICAL INTERNET

**System Description:**

The NOC-V is intended to provide the S6 with an operational facility and an integrated means to plan, manage, monitor, and control battlefield systems and networks that are within their management domain. The NOC-V integrates existing capabilities to manage, protect, and support the Tactical Internet (TI) and Tactical Operation Center (TOC) Local Area Network (LAN) communications. The NOC-V will be organic to the supported unit and aid its ability to be self-supporting. The NOC-V will also support the capability to handle Secret (threshold) and Sensitive Unclassified Information (SUI) classification levels for separate battalions, brigade size units, and above (objective). In addition, the NOC-V can provide an integrated subscriber service capability In Accordance With (IAW) the echelon supported and transmission system availability, through a switching node. The NOC-V is organic to the SBCT and contributes to its ability to operate independently.

The NOC-V consists of a shelterized network operation center that is transported on an Expanded Capacity Vehicle and a support Heavy High Mobility Multipurpose Wheeled Vehicle (HMMWV) towing a trailer. A brief description of the GFE/GOTS integrated network management systems follows:

**(1) Network Management Terminal.** Used for the management of the Near-Term Digital Radio (NTDR) network of radios. The NTDR system is a brigade and below mobile packet radio network used to support Tactical Operations Center (TOC)-to-TOC operations. The radio operates in 225-450 megahertz (MHz) range and has a 4 MHz bandwidth with a 288 kilobytes per second (kbps) data rate.

**(2) Enhanced Position Location Reporting System (EPLRS) Network Manager.** ENM manages the EPLRS network of radios Tactical Internet (TI). The EPLRS is a frequency hopping radio system that provides data distribution and positioning transmission to the user and higher headquarters. Computing and reporting position location, navigation aids, and friendly identification are the key battlefield visibility and synchronization features. It operates in the 420-450 MHz range with low data rates of 3840 bits per second (bps) and high data rates to 100 kbps.

**(3) The ISYSCON (V)4 Tactical Internet Management System (TIMS).** TIMS provides network planning and management for the Lower TI and TOC Local Area Network (LAN). ISYSCON (V)4 will perform network planning, initialization, management, and monitoring of the TI for FBCB2, Army Battle Command System (ABCS), and TOC LANs.

**(4) Internet Controllers (INC).** The INC manages the SINGCARS radios. INCs are single circuit card, militarized Internet-based routers. They provide the ability to send messages between any segments of the tactical battlespace network.

**(5) SWLAN Management System (SWMS).** SWMS provides the management for the wireless network of radios. The SWLAN provides Ethernet communications between TOC vehicles utilizing commercial 802.11 b standard and a KG-235 Inline Network Encryptor (INE). The wireless LAN is used for jump TOC operations and can also be used for contingency or supplement to the fiber connection.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to

Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- SECOMP-I

**Reference** (Brown et al., 2006):

Brown, A., DesLauriers, T., Hall, L., Britton, A., Falcon, A., Jones, M., & Manasco, C. (2006). System Evaluation Report (SER) for the Secure Enroute Communications Package-Improved (SECOMP-I) (Provided as Input to Support a Full Rate Production Decision): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 62199164. DTIC ADB321064.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

250200 - Radio Communications

150100 - Military Forces and Organizations

Descriptors:

(U) \*TEST AND EVALUATION, \*MOBILE, \*SECURE COMMUNICATIONS, SURVIVABILITY, DATA ACQUISITION, OPERATIONAL READINESS, OPERATIONAL EFFECTIVENESS

**System Description:**

SECOMP-I is an acquisition category (ACAT) III product managed by the Product Manager, Multi-Channel Satellite Terminals (PdM MST) of Project Manager, Warfighter Information Network - Tactical, (PM WIN-T). The combat developer is the United States Army Signal Center (USASC). Army forces will use the Army Battle Command System (ABCS) software or other Joint C2 software to conduct effect enroute mission planning and rehearsal (EMPR), relying on the communications infrastructure provided by the SECOMP-I. The SECOMP-I is designed to enable a Specified Command, Land Component Commander (LCC) and joint task forces to use their command, control, computers, communications, and intelligence, surveillance, and reconnaissance (C4ISR) systems on C-130 and C-17 aircraft to continue command and control (C2) and EMPR processes during rapid deployment operations. It is also designed for use aboard maritime vessels. The operational architecture consists of: (1) a Flying Local Area Network (FLAN) for aircraft configurations (C2, Brigade (Bde)/Battalion (Bn), and Company); (2) sea (theater support vessels - (TSVs); and (3) ground configurations of a ground terminal (GT), and a roll-off ground configuration (ROGC). The GT and the ROGC are located at the Rear HQ and the Objective Area. SECOMP-I is designed to: (1) enable near realtime situational awareness and robust, collaborative, EMPR capabilities down to the company level, and (2) enable the commander to receive and disseminate critical real-time tactical information via voice and data. This allows the commander to modify and disseminate plans and orders while enroute to an objective area, which helps prevent information blackout periods. The following capabilities summarize the design:

- Ethernet local area network (LAN) on board aircraft for intra-platform voice and data communications.
- Supports the battlestaff with up to 15 laptop computers and voice radio headsets per aircraft configuration.
- Rack mounted components in stackable transit cases loaded on USAF C-17/ C-130 aircraft.
- Dismountable for initial ground communications capability.
- Interim wideband beyond line-of-site (BLOS) capability via the International Marine Satellite (INMARSAT), evolving toward military Ka band in the future.
- Communications and computer networking to enable robust, collaborative, voice, and digital EMPR capabilities.
- FLAN for inter-platform data communications (5 megabits per second (Mbps) aggregate).
- Enables Army and Joint command and control applications such as the Defense Collaboration Tool Suite (DCTS).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to

Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458:

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**System Short Name:** SER- ABCS- SWLAN

**Reference** (Pfoutz et al., 2005):

Pfoutz, M., Rivera, M., Stinnette, E., Jones, M., Lee, J., Powers, B., Doyle, K., Miller, M., Manasco, C., & Barboza, M. (2005). System Assessment (SA) for the Secure Wireless Local Area Network (SWLAN). Based on the Network Wide Developmental Test (NWDT) U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB312994.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)  
Fields and Groups:

120700 - Computer Systems

250200 - Radio Communications

Descriptors:

(U) \*LOCAL AREA NETWORKS, \*SYSTEMS ANALYSIS, \*SECURE COMMUNICATIONS,  
CRYPTOGRAPHY, BATTLEFIELDS, FREQUENCY BANDS, COMMUNICATIONS NETWORKS,  
COMMAND AND CONTROL SYSTEMS, COMMUNICATION EQUIPMENT, COMPUTER  
COMMUNICATIONS

Identifiers:

(U) SWLAN(SECURE WIRELESS LOCAL AREA NETWORK)

**System Description:**

The SWLAN is required to provide secure wireless connectivity and transmission of Army Battlefield Communications System (ABCS) Ethernet Local Area Network (LAN) traffic through routers and switches for a network of Tactical Operations Center (TOC) vehicles when cabled connectivity is not available or practical. SWLAN supports the commander by providing wireless connectivity of command and control (C2) information during Quick-Halt, Jump-TOC, and static operations within a 0.8 square km or 1 km with line-of-sight conditions at an aggregate data throughput of no less than 5 Mbps for a minimum of six vehicles. SWLAN includes transmit, receive, interface, and processing functions. SWLAN is required to provide National Security Agency (NSA) Type 1 encryption using the Sectera(trade mark) inline network encryptor (INE). The frequency bands of operation, selectable by the user, are 2.4 Ghz and 4.4 Ghz. There are two antennas for each band for use inside and outside the continental United States operations. The front panel has accessible INE controls, alarms, switches, light emitting diode indicators, operator data, and antenna connections. The rear panel provides fan-cooling exhaust, power connections, and a single RJ-45 connector to the platform's classified network.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ADV FSC

**Reference** (Walker et al., 2001):

Walker, J., Morris, J., Juba, A., & Lisdsay, Y. (2001). System Evaluation Report (SER) for the Advanced Food Sanitation Center (ADV FSC) (Milestone I/II Decision): U.S. Army Operational Test and Evaluation Comd., ATTN: CSTE-EAC-CC, Park Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB268309.

**Key Words:**

\*systems analysis, \*sanitation, \*food service, warfare, manufacturing,

decision making, production, efficiency, modular construction, phase, food,  
field equipment, kitchens, containerizing  
adv fsc(advanced food sanitation center)

Fields and Groups:

060800 - Food, Food Service and Nutrition

Descriptors:

(U) \*SYSTEMS ANALYSIS, \*SANITATION, \*FOOD SERVICE, WARFARE, MANUFACTURING,  
DECISION MAKING, PRODUCTION, EFFICIENCY, MODULAR CONSTRUCTION, PHASE, FOOD,  
FIELD EQUIPMENT, KITCHENS, CONTAINERIZING

Identifiers:

(U) ADV FSC(ADVANCED FOOD SANITATION CENTER)

**System Description:**

The Adv FSC will be the primary system for maintaining food service sanitation in combat field kitchens, including the CK; Mobile Kitchen Trailer (MKT); the Kitchen, Company Level, Field Feeding System-Enhanced (KCLFF-E); and the Modular Field Kitchen (MFK). The Adv FSC is being designed as a replacement for the existing Food Sanitation Center (FSC) to provide a more efficient capability to clean and sanitize food service preparation equipment and serving equipment to include any Immersion Heaters (IH) that remain in use in the field. The Adv FSC will be housed in an Army standard Modular General Purpose Tent-Small (MGPT-S) with lighting kit. The Adv FSC consists of three sanitation sinks, Multi-fuel Burner Unit (MBU) with power converter, a pump-fed water heater/pressure washer, drain line filtration/grease separator system, drain table and drying/storage racks.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- ATIRCM-CMWS

**Reference** (Prather et al., 2002):

Prather, M., Swiger, A., Zurmuehlen, K., Rigler, L., & Peters, J. (2002). System Evaluation Report (SER) for the Common Missile Warning System/Advanced Infrared Countermeasures Munitions (CMWS/AIRCMM): U.S. Army Evaluation Center (AEC), Aberdeen Proving Ground, MD. Report #: 21548658. DTIC ADC068594. Report Classification: SECRET. Citation Classification: Unclassified.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

010300 - Aircraft

170404 - Optical Countermeasures

Descriptors:

(U) \*AIRCRAFT EQUIPMENT, \*INFRARED COUNTERMEASURES, \*GUIDED MISSILE DETECTION, TEST AND EVALUATION, METHODOLOGY, INTEGRATED SYSTEMS, CONTROL SYSTEMS, DETECTORS, DECISION MAKING, SURVIVABILITY, THREATS, ELECTRONIC EQUIPMENT, LASERS, RELIABILITY, ARMY EQUIPMENT, HELICOPTERS, COMMAND AND CONTROL SYSTEMS, INFLIGHT, AMMUNITION, PROCUREMENT, JAMMING, DECOYS, SYSTEMS ANALYSIS, INFRARED RADIATION, ARMY OPERATIONS, MESSAGE PROCESSING, MILITARY TACTICS, UTILITY AIRCRAFT, WARNING SYSTEMS

**System Description:**

(U) SIIRCM (-) is designed to detect, declare, and decoy in-flight, threat, infrared missiles. The system consists of the CMWS (sensors and Electronic Control Unit (ECU)), Improved Countermeasure Dispenser (ICMD), and AIRCMM (flares). The complete SIIRCM system (an ACAT IC program) consists of the SIIRCM (-) components plus a laser jammer, the Advanced Threat Infrared Countermeasure (ATIRCM).

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- ATIRCM-CMWS

**Reference** (ATEC, 2006):

ATEC. (2006). System Evaluation Report (SER) for the Common Missile Warning System (CMWS) (U): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 60828104. DTIC ADC072237.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

131200 - Safety Engineering

170400 - Countermeasures

170501 - Infrared Detection and Detectors

Descriptors:

(U) \*GUIDED MISSILES, \*WARNING SYSTEMS, DETECTION, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, RELIABILITY, ELECTROMAGNETIC INTERFERENCE, PROTECTION, DECOYS

Declassification:

25x3, 25x4

Identifiers:

(U) CMWS(COMMON MISSILE WARNING SYSTEM), SUITABILITY, LIMITATIONS, ICMD(IMPROVED COUNTERMEASURES DISPENSER), AIRCMM(ADVANCED INFRARED COUNTERMEASURE MUNITION), CONTROLS, INFRARED MISSILES, HEAT-SEEKING MISSILES

**System Description:**

Common Missile Warning System (CMWS).

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- Fixed Wing- Cargo- C17 DRAS

**Reference** (Lee et al., 2002):

Lee, I., Fujiwara, M., Jubba, A., Berlind, R., & Jastrap, G. (2002). System Evaluation Report (SER) for the C-17 Dual Row Airdrop System (DRAS): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB278158.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

010305 - Transport Aircraft

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*AIR DROP OPERATIONS, \*TRANSPORT AIRCRAFT, VOLUME, FORWARD AREAS, RAILS, TURBULENCE, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, PLATFORMS, RIGGING, AERIAL DELIVERY, CONTROL PANELS, LOCKS(WATERWAYS)

Identifiers:

(U) DRAS(DUAL ROW AIRDROP SYSTEM), DRAC(DUAL ROW AIRDROP CAPABILITY), C-17 AIRCRAFT, DECK ANGLE

**System Description:**

The system is composed of common rigging items, outriggers and Dual Row Airdrop Capability (DRAC) platforms, which are modified Type V platforms (width reduced from 108 to 88 inches and length increased from 16 to 18-feet). The DRAC platform interfaces with the logistic rail system on the C-17 Aircraft and is gravity released out of the aircraft using a mandatory 4-degree ( $\pm 1/2$ ) nose-up deck angle. The DRAS system also consists of any other airdrop items necessary to air-drop cargo weighing up to 14,500 pounds and fits on the 18'x 88"platform. DRAS allows a C-17 to air-drop twice as many platforms per pass than Low Velocity Airdrop (LVAD) procedures allow.

The configuration tested during IOTE and FDE consisted of the following key components: 18'x88" platform and rails, outriggers (98-inches), G-11D parachutes (without centerline and maximum capacity of 4,250 pounds) cargo parachutes, 28-foot deployment parachute, 15-foot releasable static line, and an Attitude Control System (ACS).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- Fixed Wing- Cargo- JCA C-27

**Reference** (Simoni et al., 2007):

Simoni, S., Vogt, J., Velasquez, R., Kennedy, J., London, C., Duda, S., Cochran, J., Heflin, M., Chalk, C., Howard, A., Addison, C., Sharp, C., Manning, W., & Durbin, D. (2007). System Evaluation Report (SER) for the Joint Cargo Aircraft (JCA): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 8018100016.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

**System Description:**

The C-27J has the potential to meet all operational criteria. The aircraft has the capability to perform the JCA's primary mission of moving mission-critical/time-sensitive cargo to forward tactical units in remote and austere unimproved locations. The C-27J is a multifunctional aircraft, able to perform JCA secondary missions of logistical resupply, casualty evacuation (CASEVAC), troop movement, airdrop operations, humanitarian assistance, and Homeland Security support.

The C-27J is equipped with the necessary navigation, communication, safety and surveillance subsystems to meet requirements of Federal Aviation Regulations (FAR) 25, which is the government's airworthiness standard for transport category aircraft. It is also equipped with appropriate additional navigation, surveillance, communication and datalink: packages to provide a high level of military net-centric capability. The result is an architecture that should enable the C-27J aircraft to be certified and to navigate safely through civil airspace to a theater of operations, and then to transition to secure military operations in-theater as a fully integrated node in the networked battlespace.

As per the vendor's proposal, the C-27J exceeds the payload and range additional attribute, which is to carry 12,000 pounds for a combat radius of 600 nautical miles (nm). The C-27J can carry the requisite weight of 12,000 pounds for a combat radius of 865 nm and, conversely, can carry 14,100 pounds for the prescribed combat radius of 600 nm.

In its current configuration, the aircraft is unable to meet the Aerial Sustainment additional attribute which is to carry 18,000 pounds a distance of 1,200 nm. The vendor's proposal states that the aircraft is currently capable of carrying 14,900 pounds for the prescribed distance.

The C-27J can accommodate three standard pallets that can be offloaded directly into a CH-47 Chinook Helicopter or on to a medium tactical vehicle (MTV).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- Fixed Wing- Intel- PROPHET

**Reference** (Kurinsky, 2002):

Kurinsky, L. (2002). System Evaluation Report (SER) for the Prophet Block II/III Acquisition Milestone (Phase B): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB284161.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

170400 - Countermeasures

170501 - Infrared Detection and Detectors

Descriptors:

(U) \*ELECTRONIC WARFARE, \*ACQUISITION, \*ARMY PROCUREMENT, TEST AND EVALUATION, SIGNAL PROCESSING, MILITARY REQUIREMENTS, SURVIVABILITY, INTEROPERABILITY, SYSTEMS ANALYSIS, LIFE CYCLES, FIXED WING AIRCRAFT, ELECTRONIC COUNTERMEASURES, INFORMATION PROCESSING

Identifiers:

(U) \*PROPHET BLOCK II/III PROJECT, \*SER(SYSTEM EVALUATION REPORT)

**System Description:**

PROPHET Block-II [Electronic Attack (EA)] and PROPHET Block-III [Electronic Surveillance (ES)] (PROPHET Block II/III).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- Fixed Wing- Intel- PROPHET Ground

**Reference** (Conner et al., 2001):

Conner, W., Morel, P., Sheroke, B., Sereno, J., & Riley, D. (2001). System Evaluation Report (SER) for the Milestone III for the Prophet Ground. Block 1: U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADC066040.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

150400 - Military Intelligence

Descriptors:

(U) \*SYSTEMS ANALYSIS, \*TACTICAL INTELLIGENCE, \*COMMUNICATIONS INTELLIGENCE, TEST AND EVALUATION, GROUND LEVEL, ELECTRONICS, ENVIRONMENTS, BRIGADE LEVEL ORGANIZATIONS, DIRECTION FINDING, OPERATIONAL EFFECTIVENESS, INTERFEROMETRY, SIGNALS, PROTECTION, MILITARY COMMANDERS, DEMODULATION, CHANNELS, VOICE COMMUNICATIONS, EARLY WARNING SYSTEMS, ELECTRONIC INTELLIGENCE, LOW INTENSITY

**System Description:**

Prophet Ground. Block 1.

**Report Availability:**

Secret/NoForN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- Helicopter- Aircrew- AW

**Reference** (Unruh et al., 2003):

Unruh, K., Pierce, C., Kennedy, J., Vogt, J., Escudero, L., Minninger, J., Patterson, D., Trigger, M., & Madron, J. (2003). System Evaluation Report (SER) for the Air Warrior Block 1: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 30938805. DTIC ADB287671.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

010301 - Helicopters

230500 - Life Support Systems

230600 - Escape, Rescue and Survival

Descriptors:

(U) \*ATTACK HELICOPTERS, \*LIFE SUPPORT SYSTEMS, \*SURVIVAL EQUIPMENT, TEST AND EVALUATION, MILITARY REQUIREMENTS, SURVIVABILITY, FLIGHT CREWS, OPERATIONAL READINESS, ARMY EQUIPMENT, MILITARY CAPABILITIES, SYSTEMS ANALYSIS, FLIGHT CLOTHING

Identifiers:

(U) UH-60A/L AIRCRAFT, CH-47D AIRCRAFT, AH-64A/D AIRCRAFT, \*AIR WARRIOR

**System Description:**

**AW Key Features and Subsystems.**

a. The AW is a joint service interest Acquisition Category (ACAT)III program that will effectively integrate state-of-the-art aircrew mission equipment with personal protective gear and clothing that is primarily aircrew-mounted. A three-block approach is being pursued in the development and manufacture of the AW System. Block 1 is directed toward currently available technology. Block 2 and Block 3 will focus on the insertion of emerging technologies and resolution of issues surfaced in prior blocks.

The Survival Equipment Subsystem (SES) refers to the primary survival gear carrier (pSGC), thigh holster, knife pouch, extension tether, over water gear carrier (OWGC), lumbar cushion, under water breathing device mouthpiece cover, flotation collar, soft body annor, ballistic upgrade plate, and raft integration assembly.

b. The system design requirements are in the System Performance Specification (SPS) AW-PRF-09I696D. The AW System shall enhance crewmember performance by the placement and integration of operational and protective systems within the host aircraft, optimizing the size and weight of systems the aircrew must wear or carry. The AW can be tailored to support operations in all geographic regions and environmental conditions against the current and future threat. The AW is designed to be readily accessible for use during or immediately following, egress from an aircraft that has crashed or executed a forced landing or ditching.

c. The AW System shall perform satisfactorily during day or night adverse weather conditions. Supported altitudes vary from sea level to 20,000 feet above sea level. Army aviation operations shall be supported in environmental conditions as specified in Army Regulation (AR) 70-38 for hot to basic cold climatic design. Temperatures ranging from +125 degrees Fahrenheit (OF) to -25 OF shall be supported, and missions shall be flown over land and water.

**AW-Equipped Aircraft.** This evaluation focused on the operability of the AW System by UH60AIL, CH-47D, OH-58DR, and AH-64D aircrews. Although, the special operations aircraft (AH/MH-6, MH-47DIE, and MH-60LIK) are supported by Block 1, they were not evaluated. The U.S. Army Special Operations Command is tailoring AW for their specific needs and will test their configurations at a later date. Additionally, a variant of the UH-60Q will become the MEDEVAC aircraft in the future and will be tested with a future block of AW contingent upon the fielding date of the UH-60Q.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- Helicopter- Aircrew- AW EDM

**Reference** (Unruh and Johnson, 2005):

Unruh, K., & Johnson, R. (2005). System Assessment (SA) for the Electronic Data Manager (EDM) Technical Insertion for Air Warrior (AW) (Filed with DB43447937): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 50847974. DTIC ADB306553.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

090100 - Electrical and Electronic Equipment  
120500 - Computer Programming and Software

Descriptors:

(U) \*ELECTRONICS, \*DATA MANAGEMENT, COMPUTER PROGRAMS, DATA BASES, OPERATIONAL EFFECTIVENESS, GLOBAL POSITIONING SYSTEM, MANAGEMENT PERSONNEL, SYSTEMS ANALYSIS, SITUATIONAL AWARENESS

Identifiers:

(U) \*ELECTRONIC DATA MANAGER, EDM(ELECTRONIC DATA MANAGER), CT(CUSTOMER TEST), DT/OT(DEVELOPMENTAL TEST/OPERATIONAL TEST), FRP(FULL RATE PRODUCTION), JMPS(JOINT MISSILE PLANNING SYSTEM), AMPS(AVIATION MISSION PLANNING SYSTEM), AW(AIR WARRIOR)

**System Description:**

The EDM replaces the U.S. Army-issued kneeboard. It displays friendly and hostile icons on a moving map that constantly shows the user's location. It also receives text messages. The EDM interfaces with the BFT system. Global Positioning System (GPS) data are received from the Precision Lightweight GPS receiver (PLGR), which is part of the BFT system. It accepts downloaded mission plans from the Aviation Mission Planning System (AMPS) and the Joint Mission Planning System (JMPS), provides FalconView mission-planning capabilities, and provides limited off-site mission planning. The EDM is approximately the same size as the U.S. Army-issued kneeboard.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

**System Short Name:** SER- Aircraft- Helicopter- Aircrew- Cooling- MCS

**Reference** (Streilein, 2002):

Streilein, J. J. (2002). System Evaluation Report (SER) for the Microclimatic Cooling System (MCS): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB285573.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

010301 - Helicopters

130100 - Air Condition, Heating, Lighting & Ventilating

Descriptors:

(U) \*COOLING AND VENTILATING EQUIPMENT, \*MICROCLIMATOLOGY, ATTACK HELICOPTERS, PRODUCTION, SURVIVABILITY, FLIGHT CREWS, COMBAT SUPPORT, SYSTEMS ANALYSIS, ARMY AIRCRAFT, LEAD TIME

**System Description:**

Microclimatic Cooling System (MCS).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- Helicopter- Aircrew- Ensemble- FREE

**Reference** (McIntosh et al., 2008):

McIntosh, S. W., Pines, M., Bolshazy, M., Marhart, B., Jais, C., & Addison, C. (2008). Operational Test Agency Evaluation Report (OER) for the Fire Resistant Environmental Ensemble (Free) System Integrator - Ads: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. ARMY EVALUATION CENTER ALEXANDRIA VA. DTIC ADB343995.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA), OTA Assessment Report (OAR), OTA Milestone "x" Assessment Report (OMAR), OTA Evaluation Report (OER), OTA Follow-on Evaluation Report (OFER), Operational Test Report (OTR), Abbreviated Operational Test Report (AOTR), Army Input to the OTA Report (AIOR)

\*operational effectiveness, \*fire protective clothing, \*test and evaluation, melting, safety, standards, fire protection, underwear, belts, jackets, gloves, fire resistance, thermal insulation, vests, reliability, compatibility, socks, survivability

free(fire resistance environmental ensemble), after flame, aviation compatibility, bacteria reduction, burn injury protection, char length, combat vehicle crewman compatibility, dripping, moisture barrier, pants, suitability, warmth, moisture wicking

Fields and Groups:

230400 - Protective Equipment

Descriptors:

(U) \*OPERATIONAL EFFECTIVENESS, \*FIRE PROTECTIVE CLOTHING, \*TEST AND EVALUATION, MELTING, SAFETY, STANDARDS, FIRE PROTECTION, UNDERWEAR, BELTS, JACKETS, GLOVES, FIRE RESISTANCE, THERMAL INSULATION, VESTS, RELIABILITY, COMPATIBILITY, SOCKS, SURVIVABILITY

Identifiers:

(U) FREE(FIRE RESISTANCE ENVIRONMENTAL ENSEMBLE), AFTER FLAME, AVIATION COMPATIBILITY, BACTERIA REDUCTION, BURN INJURY PROTECTION, CHAR LENGTH, COMBAT VEHICLE CREWMAN COMPATIBILITY, DRIPPING, MOISTURE BARRIER, PANTS, SUITABILITY, WARMTH, MOISTURE WICKING

**System Description:**

The FREE is a programmatic designation for a modular, tailorable, scalable, fire resistant (FR), environmental clothing ensemble.. The FREE is intended to be used by air and mounted crewmembers who are required to wear FR uniforms while operating aircraft and combat vehicles. In accordance with the CPD, the FREE consists of layers designed to be worn both under and on top of the Soldier's uniform. The under layers are designed to provide warmth, moisture wicking, and a degree of fire resistance. The outer layers are designed to provide a degree of fire resistance along with protection from the cold, wind, and rain. The FREE is intended to be color-compatible (universal camouflage and foliage green) with ground Soldier uniforms and provide armor and air crewmembers with the flexibility needed for field operations in rapidly evolving environments. The ensemble is intended to be functional in multiple cold and wet weather climates and activities. Additionally, it is designed to be comfortable and ergonomically efficient for wear in the confines of aircraft and armored vehicles. The FREE is intended to provide Soldiers, who have specialized jobs that expose them to fire hazards, the same type of extreme cold-weather gear the rest of the Army is receiving with the Generation III Extended Cold Weather Clothing System (ECWCS). The FREE is considered to be an upgrade to the Aircrew Cold Weather Clothing System (ACWCS). The ACWCS is described in appendix A. Items indicated as not evaluated were not available for Soldier issue during the Limited User Evaluation (LUE). The FREE system consists of the following layers/components:

**(1) Undergarment layer** consisting of a t-shirt, male boxer briefs or female sports bra and briefs. Elite Issue Flame Retardant Heat Opposing Technology (HOT) T-Shirt and Male Brief The HOT t-shirt and male brief are manufactured by Danskin, Inc. The Elite Issue Flame Retardant Heat Opposing Technology (HOT) short-sleeve crew neck t-shirt is a semi-loose garment that provides moisture wicking capabilities in hot environments. The Elite Issue Flame Retardant HOT boxer brief is designed as a base layer providing support for men while balancing the needs of moisture management and fire resistance. The t-shirt and boxer brief are made of a tri-blend flame retardant rayon/wool/nylon material that utilizes an antimicrobial! anti-odor Smart Silver material as opposed to a treatment. Elite Issue Flame Retardant MOD Female Brief and Sports Bra. Danskin, Inc. manufactures the Woman's Racer Back Bra Top (style 114) and Woman's Boy Leg Brief (style 115). The Elite Issue Flame Retardant MOD boy short brief is the undergarment layer for women that balances the needs for moisture management and fire resistance. The Elite Issue Flame Retardant MOD Sports Bra (style 114) prohibits movement while trying to maintain comfort. The MOD female brief and sports bra are made of a modacrylic/polyester/X-static/Spandex fabric. The antimicrobial /anti-odor X-Static is within the fabric. The modacrylic is designed to contribute to the flame retardant properties and not melt or drip.

**(2) Base layer top and bottom.** Elite Issue Flame Retardant HOT. The long-sleeve shirt and pants provide maximum comfort in hot climates and/or can be worn under the mid weight layer for maximum comfort in cold weather. The base layer top and bottoms are made of a triblend flame retardant rayon/wool/nylon material that utilizes an antimicrobial! anti-odor Smart Silver material as opposed to a treatment.

**(3) Mid weight under layer top and bottom.** Peckham 9218. The mid weight top and bottom provide maximum comfort when worn over the under and base layers and underneath the uniform. The top is a half-zip pullover style with stand-up collar; the sleeves are one-piece raglan sleeves with an underarm mesh inset and rib knit cuffs with thumb holes with bottom extensions on the front and back. The bottom is a pull-on style with elastic waistband and brief style fly with cuffs at the bottom to aid in keeping the pants down.

**(4) Light weather outer layer jacket and pant.** MassifElements Lite. The wind jacket and pants are designed to offer a lightweight alternative for protection from the elements in cool and windy conditions. The fabric features a waterproof, windproof, and breathable membrane with a four-way stretch capability. All garments have an abrasion resistant exterior and full FR construction including zippers, thread, cord, Velcro, and pockets. All stress points and pocket welts are reinforced with bar tacks and extra stitching. The jacket features a high protective collar and FR draw-cord waist closure system to effectively seal out the cold. The easy-access main zipper and underarm zippers allow for adjustable ventilation. Tapered arms minimize bulk and articulated cuffs with Velcro closures provide extra flame protection and the extra pockets are positioned to cater to Soldier attire. The pants are constructed of 100 percent FR

components, including an elastic waist belt. The pants feature zippered hand warmer pockets, a zippered back pocket, and a lower-leg cargo pocket designed to be fully compatible with the Air Warrior Ensemble and thigh holster. The jacket is designed to be worn with the Aviation Uniform and Combat Vehicle Crewman (CVC) Coverall, and features a "pass-through" flap for the Cvc extraction strap that seals with Velcro when not in use.

**(5) Intermediate weather outer layer jacket, pant, and vest.** Massif/Elements. The fabrics are designed to offer a high warmth-to-weight ratio, minimizing bulk and maximizing range of motion while protecting from wind, rain, sleet, and snow. The softshell fabric features a waterproof, windproof, and breathable membrane with a four-way stretch capability and a soft fleece interior that is designed to not trap moisture during high-activity situations. All garments have an abrasion resistant exterior and full FR construction including zippers, thread, cord, Velcro, and pockets. All stress points and pocket welts are reinforced with bar tacks and extra stitching. The jacket features a fleece-lined protective collar with a FR draw-cord waist closure system to effectively seal out the cold. The easy-access main zipper and underarm zippers allow for adjustable ventilation. Tapered arms minimize bulk. Massif sand cuffs eliminate the need for Velcro wrist closures and provide extra flame protection. Extra pockets, which feature FR closures, are positioned to cater to Soldier attire. The Massif Elements jacket has received the Thermal Manikin Test and the Arc Thermal Performance Value (ATPV). The pants are constructed of 100 percent FR components, including an elastic waist belt. The pants feature zippered hand warmer pockets, a zippered back pocket, and a lower-leg cargo pocket designed to be fully compatible with the Air Warrior Ensemble and thigh holster. The Massif Elements jacket is designed to be worn with the Aviation Uniform and eve Coverall, and features a "pass-through" flap for the eve extraction strap that seals with Velcro when not in use.

**(6) Extreme weather outer layer parka (with liner) and pant. Barrierwear Parka and Pants.** The parka shell and pant shell are comprised of an FR Nomex tri-laminate. The outer face is a plain-weave Nomex, the inner face is a Nomex jersey. Both are laminated to a core of expanded polytetrafluoroethylene (EPTFE) waterproof, breathable membrane. The components on the parka and pants are: • FR Velcro, Nomex size 30/3 thread, and 45-millimeter anodized brass snaps. • Outer shell, Massif Downpour fabric using Defender M. • Middle layer, event PTFE. • Inner layer, Nomex jersey. The parka shell has raglan sleeves, hidden cobra hood, #10-Nomex tape front zipper with high temperature nylon teeth, and inner YKK #5-Nomex tape high temperature nylon tooth zipper which gives it the capability to attach the Nomex fleece liner. The parka has two patch pockets with Velcro flaps, hand warmer pockets, inner map pocket, lanyard tunnel to access the inner strapping system on the eve coverall, rank tab, elastic and Velcro sleeve adjuster tabs, Velcro front placket with drain tunnel, YKK #5-Nomex tape arm pit zippers with high temperature nylon teeth with snap placket, seam sealed with Nomex 7/8" seam tape. The trouser has a #5-Nomex tape fly zipper with high temperature nylon teeth, #5-Nomex tape leg zippers with high temperature nylon teeth, reinforced butt and knees, two pass-through-pockets with snap flaps, two cargo pockets with Velcro flaps, 3/8" nylon bungee cord waist adjustment with barrel locks, seam sealed with 7/8" Nomex seam tape. Zip-outfleece jacket. The fleece jacket has a front zipper that is a YKK #5-Nomex tape zipper with high temperature nylon teeth, two front pockets with YKK #5-Nomex high temperature nylon teeth, set sleeves, elastic cuffs with an attachment system using a loop on the fleece jacket and a Velcro loop system on the shell parka. The fabric is a 13-ounce Nomex fleece with Nomex size 30/3 thread.

**(7) Cold weather flyer's glove.** Danalco. The Danalco HANZ COMBAT UTILITY GLOVE serves as a cold weather glove that is designed to be water repellant and FR. The HANZ glove can be worn alone or under a glove shell in extreme temperatures. The HANZ gloves are designed to provide a snug fit, fire resistance, water resistance, fast drying, good durability, insulation, manual dexterity/tactility, and grip with FR grip dots on the palm site. The gloves are knit with stretch-to-fit materials consisting of DuPont's Nomex and Lycra Spandex, and have been treated with a DuPont water/oil repellant to provide for quicker drying times.

**(8) Fire resistant rigger's belt.** London Bridge Trading. The intent of the rigger belt is to offer a non-weight bearing belt for securing Battle Dress Uniform (BDU)/Army Combat Uniform (ACU) trousers. The London Bridge Trading non-weight bearing belt consists of 1--inch webbing designed to fit through the standard trouser belt loop of a BDU/ACU trouser.

**(9) Socks. Darn Tough.** The Darn Tough Vermont Merino Wool Boot Sock Cushion is designed to offer the Soldier a next-to-skin sock layer designed to not burn, drip, or melt under contact with flame or extreme heat. The sock is knit with 67 percent Merino wool, 29 percent Nylon, and 4 percent Lycra Spandex; and is constructed with dense terry loop cushioning on the foot bottom and around the leg to

provide long lasting shock absorbing cushioning and additional comfort when the boots are securely laced.

**(10) Cold weather balaclava** (not evaluated).

**(11) Hot weather balaclava** (not evaluated).

**(12) Summer flyer's glove** (not evaluated).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- Helicopter- Aircrew- Knife- ASEK

**Reference** (Streilein, 2003):

Streilein, J. J. (2003). System Evaluation Report (SER) for the Aircrew Survival Egress Knife (ASEK): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB288014.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

230600 - Escape, Rescue and Survival

Descriptors:

(U) \*KNIVES, \*SURVIVAL EQUIPMENT, FLIGHT CREWS, OFF THE SHELF EQUIPMENT, SUPPLY DEPOTS, COMMERCIAL EQUIPMENT

Identifiers:

(U) ASEK(AIRCREW SURVIVAL EGRESS KNIFE), SER(SYSTEM EVALUATION REPORT)

**System Description:**

Aircrew Survival Egress Knife (ASEK).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- Helicopter- Aircrew- Laser- ALP

**Reference** (Pines et al., 2008):

Pines, M., McCort, B., Velasquez, R., Kennedy, J., Barrett, H., Jais, C., Howard, A., & Justice, J. (2008). Operational Test Agency Evaluation Report (OER) for the Aircrew Laser Pointer (ALP): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. ARMY EVALUATION CENTER ALEXANDRIA VA. DTIC ADB343989.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA), OTA Assessment Report (OAR), OTA Milestone "x" Assessment Report (OMAR), OTA Evaluation Report (OER), OTA Follow-on Evaluation Report (OFER), Operational Test Report (OTR), Abbreviated Operational Test Report (AOTR), Army Input to the OTA Report (AIOR)

\*infrared equipment, \*operational effectiveness, \*test and evaluation, near infrared radiation, safety, commercial equipment, night vision devices, compatibility, flight crews, cockpits, long range(distance)

\*laser pointers, kpp(key performance parameters), manprint(manpower and personnel integration),  
electromagnetic environmental effects, \*illuminators, signaling devices, suitability

Fields and Groups:

170501 - Infrared Detection and Detectors

Descriptors:

(U) \*INFRARED EQUIPMENT, \*OPERATIONAL EFFECTIVENESS, \*TEST AND EVALUATION, NEAR  
INFRARED RADIATION, SAFETY, COMMERCIAL EQUIPMENT, NIGHT VISION DEVICES,  
COMPATIBILITY, FLIGHT CREWS, COCKPITS, LONG RANGE(DISTANCE)

Identifiers:

(U) \*LASER POINTERS, KPP(KEY PERFORMANCE PARAMETERS), MANPRINT(MANPOWER AND  
PERSONNEL INTEGRATION), ELECTROMAGNETIC ENVIRONMENTAL EFFECTS, \*ILLUMINATORS,  
SIGNALING DEVICES, SUITABILITY

**System Description:**

The ALP is a commercial-off-the-shelf (COTS) signaling device that will be utilized by Air Soldiers to direct fires, identify friend and foe, and signal adjacent formations. It is a long-range, near infrared (IR) laser pointer and illuminator designed for use by combat aviators and aircrew of select manned aircraft wearing night vision devices (NVDs) in maneuver, maneuver support, and maneuver sustainment roles involved in the full spectrum of conflict. The system is hand-mounted to permit ease of use in the cockpit. Air crewmembers will use the ALP in all operational environments and in support of all types of operations. The ALP is intended to complement the Air Warrior (AW) and future Air Soldier System (Air SS) ensembles, enhancing the operational capabilities of the Air Soldier through technology insertion.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- Helicopter- Attack- Apache Longbow AH-64D

**Reference** (Mraz, 1998):

Mraz, A. (1998). System Assessment (SA) for the Longbow Apache (AH-64D) Transportability Demonstration: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report # 82546087. DTIC ADB237884.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

010301 - Helicopters

010305 - Transport Aircraft

Descriptors:

(U) \*ATTACK HELICOPTERS, \*FIRE CONTROL RADAR, MILITARY AIRCRAFT, TRANSPORT AIRCRAFT

Identifiers:

(U) AH-64 AIRCRAFT, C-51 AIRCRAFT

**System Description:**

The Longbow (AH-64D) is the AH-64A with the modifications and enhancements necessary to facilitate the integration of the Longbow weapon sub-system. This includes a millimeter wave radar air/ground targeting system capable of being used during day, night, adverse weather, and battlefield obscurants conditions. Longbow consists primarily of the integration of a mast-mounted sight millimeter wave fire control radar (FCR), a radar frequency interferometer (RFI), and a radar frequency fire-and-forget HELLFIRE missile onto the Apache Longbow's digitized target acquisition system; providing automated detection, location, classification, prioritization, and hand-over.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- Helicopter- Attack- Apache Longbow AH-64D Block III

**Reference** (Lauer et al., 2006):

Lauer, F., Elam, J., London, C., Yurechko, P., Duda, S., Brown, R., Weigle, N., Jais, C., & Minjares, J. (2006). System Evaluation Report (SER) for the Apache Block III: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 61469134. DTIC ADB320072.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

010301 - Helicopters

010200 - Military Aircraft Operations

Descriptors:

(U) \*TEST AND EVALUATION, \*MILITARY AIRCRAFT, \*SYSTEMS ANALYSIS, SOFTWARE ENGINEERING, CLOSE SUPPORT, RISK ANALYSIS, COST REDUCTION, RETROFITTING, COMBAT SUPPORT, AIR STRIKES, MILITARY CAPABILITIES

Identifiers:

(U) \*LBA(LONGBOW APACHE AIRCRAFT), TECHNOLOGY INSERTION

**System Description:**

The Apache Block III is a modernized version of the currently fielded Longbow Apache (LBA) aircraft. The new design incorporates technology advancements harvested from other development programs and advances in processing technology since the fielding of the LBA. The planned upgrades will result in improved aircraft performance, reduced operating costs, and improved mission performance. The Apache Block III is used to conduct mobile strikes and close combat with ground forces and to support air assault and vertical maneuver missions across the full spectrum of military operations.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- Helicopter- Attack- Apache Longbow AH-64D LBHMMS

**Reference** (Tran et al., 2005):

Tran, J.-H., Lauer, F., Schlaffer, N., Minjares, J., & Sullivan, R. (2005). System Assessment (SA) for the Longbow Hellfire Modular Missile System (LBHMMS) Pre-Planned Product Improvement (P3I) Program Home-on-Jam/Anti-Jam (HOJ/AJ) Software: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADC071409. Report Classification: SECRET/NOFORN. Citation Unclassified.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

120500 - Computer Programming and Software

160401 - Air- and Space-launched Guided Missiles

**Descriptors:**

(U) \*COMPUTER PROGRAMS, \*AIR TO SURFACE MISSILES, \*GUIDED MISSILE COMPUTERS, GUIDED MISSILES, DECISION MAKING, MODULAR CONSTRUCTION, RELEASE, SYSTEMS ANALYSIS, ANTIJAMMING, COUNTERMEASURES, GUIDED MISSILE SIMULATORS, DIGITAL SIMULATION, ELECTROMAGNETIC ENVIRONMENTS

**Identifiers:**

(U) LONGBOW MISSILES, HELLFIRE MISSILES, LBHMMS(LONGBOW HELLFIRE MODULAR MISSILE SYSTEM), HOJ/AJ(HOME ON JAM/ANTI JAM)

**System Description:**

Longbow HELLFIRE Modular Missile System (LBHMMS) with the Home-On Jam/Anti-Jam (HOJ/AJ) pre-planned product improvement software modifications incorporated.

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- Helicopter- Cargo- CH47F

**Reference** (Trotter et al., 2004):

Trotter, J., Stovall, J., & Madron, J. (2004). System Evaluation Report (SER) for the Helicopter, Cargo CH47F: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 43147921. DTIC ADB303730.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

**Fields and Groups:**

010301 - Helicopters

140200 - Test Facilities, Equipment and Methods

150500 - Logistics, Military Facilities and Supplies

**Descriptors:**

(U) \*TEST AND EVALUATION, \*SURVIVABILITY, \*OPERATIONAL EFFECTIVENESS, \*HELICOPTERS, CARGO, SYSTEMS ANALYSIS

**Identifiers:**

(U) CH-47F CARGO HELICOPTER, SER(SYSTEM EVALUATION REPORT), ESS(EFFECTIVENESS SUITABILITY AND SURVIVABILITY)

**System Description:**

- a. The CH-47F is primarily a Service Life Extension Program (SLEP) for the CH-47D helicopter. The D model CH-47 is the fourth model in a series from the basic design that has served the Army with distinction since entering service during the Vietnam War. It is a twinturbine engine, tandem-rotor helicopter with the mission of conducting combat, combat support, and combat service support operations. Its geographical mission area is worldwide. The primary description, mission, and geographic operations area of the CH-47F remain the same. It will provide continued troop support and maneuverability until the Joint Transport Rotorcraft (JTR)/Army Mobile Transport (AMT) is fielded.
- b. The CH-47F encompasses three major improvement areas (two structural and one avionics). The first improvement replaces the bonded sheet metal airframe beams and formers with single billet, monolithic, machined aluminum beams and formers.
- c. The second major improvement involves a hardware process generally referred to as fuselage tuning. Fuselage tuning reduces structural vibration and increases the service life expectancy of electronic and mechanical components. These measures will reduce Operating and Support (O&S) costs.
- d. The third major improvement incorporates a fully integrated avionics suite, including the Common Avionics Architecture System (CAAS) cockpit, using the 1553 data bus, and resulting in a "digitized cockpit."

e. Integrated cockpit displays and compatibility with Data Transfer Systems (DTS) and the Aviation Mission Planning System (AMPS) will reduce aircrew workload and facilitate interoperability with digital battlefield systems currently being fielded or improved by the Army. In concert with the above, an improved transportability kit will be installed during the remanufacture process. This kit, which includes hydraulic and electronic quick-disconnects and mounting/alignment plates for the aft pylon, will enable easier/quicker removal and reinstallation of the aft pylon for air transport of the system. Additionally, an upgrade to the T55-GA-714A engine and incorporation of the Modified Engine Air Particle Separator (MEAPS), both of which are separate/parallel Engineering Change Programs (ECP), will be included in the production and conversion to the CH-47F.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- Helicopter- Cargo- CH47F

**Reference** (Trottie et al., 2007):

Trottie, J., Sharp, C., Inverso, S., Paul R , Kennedy, J., Vogt, J., Dodge, M., Escudero, L., Parsons, R., McKnelly, T., & Lukens, L. (2007). System Evaluation Report (SER) for the CH47F Cargo Helicopter: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 71779968. DTIC ADB328315.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

010301 - Helicopters

140200 - Test Facilities, Equipment and Methods

Descriptors:

(U) \*TEST AND EVALUATION, \*HELICOPTERS, SIMULATION, SYSTEMS ANALYSIS, SURVIVABILITY, OPERATIONAL EFFECTIVENESS

Identifiers:

(U) \*CH-47F AIRCRAFT

**System Description:**

**The CH-47F** is a heavy lift helicopter that will extend the service life of the current cargo helicopter fleet by an additional 20 years. The CH-47F incorporates a monolithic airframe and provides an avionics architecture, which is compliant with the DoD Information Technology (IT) Standards Registry [DISR], is interoperable with DoD systems, and is compliant with emerging Global Air Traffic Management (GATM) requirements.

**a. EMD.** Introduction of the CH-47F provided the opportunity for access to the CH-47 airframes during the rebuild process, to inject additional corrosion protection, to evaluate and enhance previous fuselage repairs, to reduce vibration levels through the stiffening and structural reinforcement of the cockpit section, to install modifications enhancing air transportability, and to upgrade the cockpit interface with an integrated avionics suite. These improvements were tested during DT and IOT Phase I, except air to ground communications.

**b. LRIP.** The LRIP aircraft was a bridge from the EMD improvements to the maturity of the full rate production configuration. The CH-47F LRIP aircraft was built on the same remanufactured aircraft concept as the EMD, but included the technical advances associated with CAAS, DAFCS, and the system maturity derived from EMD. This aircraft was used for developmental testing, certification, and training in preparation for IOT Phase II. This version of the CH-47F also provided the capabilities required in ORD Change 4: Net-Ready and Situational Awareness (SA), TACAN, Blue Force Tracker (BFT), and Global Air Traffic Management (GATM).

**(1) CAAS Cockpit.** In compliance with production guidance received from the Army G-3, the CAAS cockpit is added to the CH-47F. The CH-47F CAAS is a modified implementation of the Rockwell Collins

CAAS developed for the U.S. Army Special Operations Command (USASOC) CAAS for MH-47 and MH-60 use.

**(2) Digital Automatic Flight Control System (DAFCS).** The flight control system uses inputs from various flight state sensors to provide stabilization and control inputs to the flight controls of the aircraft. The more capable DAFCS on the CH-47F replaces the analog Advanced Flight Control System (AFCS) used on the CH-47D. The system employs two Flight Control Computers (FCCs) which contain algorithmic functions that produce control commands that are input directly into the flight controls of the aircraft. The system can maintain and control the aircraft during hover or forward flight and in all control axes.

**c. Full Rate Production.** The FRP CH-47F aircraft incorporates for delivery the improvements from the EMD and LRIP efforts. Chief among these are the monolithic airframe with improvements to the airframe system, identification and recapitalization of selected components, integration of CAAS and the associated improvements to digital messaging, and situational awareness technologies. Additionally, preparations are made to support future alignment with the development, maturity and implementation of the Army Battle Command System (ABCS) through the Software Blocking (SWB) system and implementation of the Joint Tactical Radio System (JTRS).

**(1) Monolithic Airframe Components.** Built-up sheet metal composite frame structures are being replaced with single billet, monolithic, machined aluminum beams and formers. Stiffening and retuning options incorporated into the EMD cockpit structure are retained. The main fuselage section is redesigned based on current foreign military sales aircraft. The aft section is being completely redesigned using machined frames in the crown, sides, and floor. The aft pylon is being produced using machined frames for the major structural components. The forward pylon is being produced using vacuum-assisted resin transfer molding. The ramp is being redesigned and built with machined major structure and eliminates all magnesium parts.

**(2) Selected RECAP.** The Component Recapitalization Standard is defined by the U.S. Army as: The rebuild and selected upgrade of components to ensure operational readiness and near-zero time/zero mile system (per Army Recapitalization Management Policy, paragraph I-3D, dated 11 April 2001). Components are removed from the CH-47D aircraft during the induction and disassembly phase of the CH-47 FRP contract. Upon completion, the components are reinstalled during production at the manufacturing facility.

**(3) CAAS Cockpit.** The FRP aircraft employs the same CAAS cockpit tested in LRIP.

**(4) Common Missile Warning System (CMWS).** In compliance with survivability guidance regarding the delivery of new aircraft, the CMWS is added to the CH-47F. The CMWS system (AN/AAR-57) replaces the AN/ALQ-156. In addition, the existing M-130 flare dispenser is replaced with the Improved Counter-Measures Dispenser. The CMWS consists of electro-optical sensors and an internally mounted Electronics Control Unit (ECU), which detects incoming missiles, provides warning to the crew, and dispenses countermeasures. CMWS is a passive detection system, recognizing the electro-optic signature of the missile.

#### **Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- Helicopter- Cargo- MH-47E- Engine- 714A

#### **Reference** (Gulley et al., 1999):

Gulley, M., Peters, J., Kennedy, J., Vogt, J., & Smoot, D. (1999). System Evaluation Report (SER) for the 714A Engine: U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 92108087. DTIC ADB245955.

#### **Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER  
Fields and Groups:

210500 - Jet and Gas Turbine Engines

Descriptors:

(U) \*AIRCRAFT ENGINES, DECISION MAKING, PRODUCTION, ENGINEERING, SYSTEMS ANALYSIS, OFFICER PERSONNEL, EXECUTIVE ROUTINES

Identifiers:

(U) T55-GA-714A ENGINES

**System Description:**

The 714A engine is an upgrade to the 714 engine currently installed on 25 MH-47E Special Operations Aircraft (SOA). The 714 predecessor was the 712 engine that was originally fielded with the CH-47D. The 714 provided improved engine performance and added a Full Authority Digital Engine Control (FADEC). The 714A resolves previous difficulties with the torque measuring system and provides an increase in horsepower from 3,750 on the 712 to 4,777 for the 714A. The 714A includes stainless steel compressor section housing, redesigned turbine blades/wheels and an improved air inlet.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- Helicopter- Recon- Comanche RAH66

**Reference** (Waters et al., 2000):

Waters, R., Nair, S., Reich, E., Kennedy, J., Vogt, J., Minjares, J., Grill, S., Rigler, L., Perez, G., West, R., & Durbin, D. (2000). System Evaluation Report (SER) for the Reconnaissance and Attack Helicopter (RAH66) Comanche: U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB251820.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

010301 - Helicopters

Descriptors:

(U) \*ATTACK HELICOPTERS, \*RECONNAISSANCE AIRCRAFT, TEST AND EVALUATION, SIMULATION, INTEGRATED SYSTEMS, SURVIVABILITY, PHYSICAL PROPERTIES, TEAMS(PERSONNEL), SYSTEMS ANALYSIS, EXITS

Identifiers:

(U) RAH66 AIRCRAFT, AH-66 AIRCRAFT

**System Description:**

The RAH66 Comanche is being designed to be a fully integrated, lightweight, low cost, twin engine, two-pilot, advanced technology helicopter weapons system. The Comanche is also designed to enhance the commander's ability to project, protect, and sustain the force; gain information dominance; shape the battlespace; and conduct decisive operations while increasing operator and maintainer efficiency. In addition, the Comanche system is being designed to incorporate new technology to correct major armed reconnaissance deficiencies for accomplishment of armed reconnaissance, security, and attack missions of the XXI Century force projection army. Comanche system improvements include lightweight composite airframe structures; protected anti-torque systems; low vibration, high reliability rotor systems; reduced signature; built-in diagnostics/prognostics; second-generation target acquisition and night vision sensors; and, the Comanche radar. The planned Comanche electronics architecture is to incorporate Integrated Communication, Navigation, and Identification Avionics (ICNIA) modules and Integrated Electronic Warfare Systems (INEWS) technology. The Comanche system is to be added to the Army Aviation force structure to complement the UH-60 Blackhawk and AH-64 Apache helicopters.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- Helicopter- Utility- Blackhawk UH60L RECAP

**Reference** (Gulley et al., 2000):

Gulley, M., Mraz, A., Rigler, L., Snowden, B., Kennedy, J., Vogt, J., Velasquez, R., Laughman, R., Rose, W., Mitchell, B., & Schiller, E. W. (2000). System Evaluation Report (SER) for the Recapitalization of the UH-60 Black Hawk Utility Helicopter Fleet: U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB260656.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

010301 - Helicopters

Descriptors:

(U) \*HELICOPTERS, TEST AND EVALUATION, EXPERIMENTAL DATA, RISK, SURVIVABILITY, GROWTH(GENERAL), ARMY EQUIPMENT, SYSTEMS ANALYSIS

Identifiers:

(U) UH60M AIRCRAFT, BLACK HAWK

**System Description:**

The UH-60 Black Hawk Recapitalization/Upgrade program was established to meet new requirements for increased lift, range, and survivability, and address the challenges of the aging fleet, such as decreasing operational readiness and increasing operating costs. Revitalization of the UH-60 Black Hawk fleet requires several compelling modernization requirements to project and sustain the force. Due to current technology constraints, the UH-60 Modernization ORD and the Utility Helicopter Project Office have adopted a blocked, evolutionary modernization. Block 1 is an improved version of the existing UH-60 Black Hawk Helicopter that will be equipped and capable of meeting Block 1 operational requirements for digital connectivity to enhance situational awareness, improved lift, range, deployability, survivability, and reduced operational and support costs. The Block 1 aircraft lays the foundation for meeting Block 2 operational requirements once the advanced propulsion capabilities of the common engine program become available.

Block 1 Projected Configuration. Following successful Milestone III, the Block 1 aircraft will be produced from the assembly line or remanufactured from UH-60A or UH-60L aircraft. The Block 1 configuration is based on the current UH-60L Production Lot 21 configuration with additional improvements to airframe, electrical system, main rotor blades, Flight Control Computer (FCC), and cockpit/avionics. For reference, the Block 1 aircraft baseline configuration is projected to include the specific details identified in the following subparagraphs. However, it should be noted that the actual material solutions might vary while still meeting the performance based system requirements. The final material solution will be defined at the Critical Design Review (CDR).

a. Block 1 airframe improvements are to include refurbishment or replacement of cabin components, and refurbishment of tailcone, stabilator, vertical pylon, airframe tuning devices, troop seats, and crew seats. Major airframe load paths are to be strengthened to accommodate the increased WCB capability and the aircraft usage spectrums modified to reflect growth in mission weight. The External Stores Support System (ESSS) will be added to incorporate hard points for external stores and an improved Extended Range Fuel System.

b. The Block 1 aircraft electrical wiring is to be replaced to meet the E3 requirements and accommodate new electrical system designs.

c. The current Stability Augmentation System (SAS)/Flight Path Stabilization (FPS) computer is to be replaced in the Block 1 aircraft with the Dual Use Application Program (DUAP) digital AFCC. The analog components of the flight control system are to remain unchanged.

d. The Block 1 aircraft will use the WCB which offers increased lift and will help offset the lift lost due to the increased mission weight of the Block 1 aircraft. The advanced composite main rotor blades consists

of a graphite/fiberglass spar with a swept anhedral blade tip and has a 16% wider chord than the current titanium blade. At the root end, the wide chord blade attaches to the aircraft in exactly the same manner as the current production blade.

e. The Block 1 aircraft avionics are to incorporate a communications/navigation MILSTD- 1553 data bus, Control Display Unit (CDU), Multi-Function Displays (MFDs), a stormscope, and hardware and software necessary to allow the crew to digitally communicate via the Improved Data Modem (10M). The cockpit improvements are to include a moving map and the ability to present primary flight instruments data on the MFDs.

f. The Block 1 aircraft is to include a Flight Data Recorder (FDR)/Cockpit Voice Recorder (CVR). The FDR/CVR will record all crew intercom voice, radio voice, and data messages. The FDR/CDR is required to have crash protection and be equipped with a locator beacon.

g. The Block 1 aircraft may include an improved Infrared Suppression System (IRSS) to meet objective ORD requirements for improved signature suppression performance.

h. The Block 1 aircraft is to include the Crashworthy External Fuel System (CEFS). The CEFS modified the Extended Range Fuel System (ERFS) by replacing the ERFS two 230-gallon external fuel tanks with two 200-gallon crashworthy external fuel tanks. The CEFS provides the capability to deliver fuel from external fuel tanks directly into the main fuel tanks, thereby providing any ESSS modified UH-60A and the UH-60L helicopter a substantially larger range of operation. The CEFS consists of the two 200-gallon crashworthy external fuel tanks; two (2) BRU-22A ejection racks for each ESSS removable provisions kit; a jettison subsystem; and, the necessary adapter, electrical harnesses, and the tube assemblies to complete the interface with the ESSS. Fuel is stored in two interchangeable, crashworthy, ballistic-resistant tanks. The fuel system consist of lines from the main fuel tanks, firewall-mounted selector valves, prime/boost pump and fuel tanks, and engine driven suction boost pumps. The fuel system also contains electrically operated submerged fuel boost pumps in each fuel tank which can provide pressurized fuel if engine fuel pressure drops below the minimum operating pressure.

Block 2 Projected Configuration. The Block 2 program will be initiated in conjunction with the maturation of the advance propulsion capabilities of the common engine program. The common engine program, an advanced technology program within the AMCOM AATD, will provide 3,000 shaft horsepower (SHP) with reduced fuel consumption. The Army's Apache program and the Navy's Sea Hawk program will also procure the advanced common engines. Along with the increased lift and range, the Block 2 aircraft will contain increased digitization and improved aircraft survivability. A list of the projected configuration improvements, in addition to the Block 1 configuration, for the Block 2 System are listed below for reference. Again, as noted for the Block 1 projected baseline above, the actual material solutions may vary while still meeting the performance based specification requirements. The final material solutions will be finalized at the future design reviews for the Block 2 program.

- A health utilization and monitoring system (HUMS).
- Active vibration control system.
- An approximate twenty inch extension of the cabin length by insertion of a spacer.
- A cargo hook capable of 10,000 lbs.
- 412 gallon fuel cells.
- Addition of an approximate sixteen inch spacer in the tail cone common with the Sikorsky Aircraft Company's S92 program.
- Use of the S92 tail rotor drive system.
- 3,000 SHP engines from the 1TAGG common engine program.
- Use of the Suite of Integrated Radio Frequency Countermeasures (SIRFC) and Suite of Integrated Infrared Countermeasures (SIIRCM) survivability systems.
- Addition of the S92 drive rotor controls.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- Helicopter- Utility- Blackhawk UH60M

**Reference** (Lynch et al., 2005):

Lynch, C., Cheney, D., Prather, M., Kennedy, J., Vogt, J., Reich, P., Anderson, L., Haver, T., & Swoboda, P. (2005). System Evaluation Report (SER) for the UH60M Black Hawk Utility Helicopter: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 50217952. DTIC ADB305565.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

010301 - Helicopters

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*OPERATIONAL EFFECTIVENESS, \*AIRLIFT OPERATIONS, \*UTILITY AIRCRAFT, TEST AND EVALUATION, SURVIVABILITY, HELICOPTERS

Identifiers:

(U) \*UH60M HELICOPTERS

**System Description:**

The UH60M Block 1 aircraft, an Acquisition Category (ACAT) ID program, will be produced from the assembly line as a new aircraft. The UH60M configuration is based on the current UH-60L, Lot 21 configuration, with additional improvements to the airframe, electrical system, main rotor blades, flight control computer, and cockpit avionics.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- Helicopter- Utility- Blackhawk UH60M

**Reference** (Lynch et al., 2007):

Lynch, C., Brown, J. D., Prather, M., Kennedy, J., Vogt, J., Jais, C., Velasquez, R., Manning, W., Kennedy, J., & Lukens, L. (2007). System Evaluation Report (SER) for the UH60M Black Hawk Utility Helicopter: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 71789974. DTIC ADB329019.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

010301 - Helicopters

Descriptors:

(U) \*TEST AND EVALUATION, \*HELICOPTERS, FLIGHT TESTING, UTILITY AIRCRAFT, SURVIVABILITY, OPERATIONAL EFFECTIVENESS

Identifiers:

(U) \*UH60M AIRCRAFT, BLACK HAWK AIRCRAFT, SUITABILITY

**System Description:**

The UH60M aircraft, an Acquisition Category (ACAT) ID program, will be produced from the assembly line as a new aircraft. The UH60M configuration is based on the current UH-60L, Lot 21 configuration. with additional improvements to the airframe, electrical system, main rotor blades, Flight Control Computer, and cockpit avionics. Items of note in the new aircraft include an upgraded drive train system that uses the new 7010 engines for more power, Improved Durability, Gearboxes to handle the power and offer greater ballistic tolerance. and wide chord blades that provide increased lift. The new Crashworthy External Fuel System (CEFS) provides a much needed boost to the ballistic tolerance of the external tanks that are in widespread use to extend the mission duration and range of the aircraft. Along with

CEFS many improvements to aircraft survivability were added including integrated Common Missile Warning System (CMWS), the improved laser warning system, and the improved Infra-Red (IR) suppression system. The improvements that make the biggest impact on the crews are the new digital cockpit with Multi-Function Displays (MFDs) and the fully coupled flight director (auto pilot system) that together increase the information available to the pilots while reducing the workload needed to fly the aircraft. The new digital cockpit also integrates all systems including communications, Aircraft Survivability Equipment (ASE), a new full-color moving digital map, as well as system displays. This also brings the aircraft into compliance with the modern digital battlefield standards compatible with the Army Battle Command System (ABCS) and providing the capability to communicate via the Joint Variable Message System Fonnat (JVMF) system and over long distances via the AN/ARC-231 radio's built-in tactical satellite capability.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- Helicopter- Utility- Blackhawk UH60M

**Reference** (Jackson et al., 2009):

Jackson, W., Kennedy, J., Jais, C., Velasquez, R., Minninger, J., Lukens, L., Prather, M., Ott, C., Pontes, W., & Manning, W. (2009). Operational Test Agency Assessment Report (OAR) for the UH60M Upgrade Black Hawk Utility Helicopter: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. ARMY EVALUATION CENTER ALEXANDRIA VA. DTIC ADB346881.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA), OTA Assessment Report (OAR), OTA Milestone "x" Assessment Report (OMAR), OTA Evaluation Report (OER), OTA Follow-on Evaluation Report (OFER), Operational Test Report (OTR), Abbreviated Operational Test Report (AOTR), Army Input to the OTA Report (AIOR)

\*test and evaluation, \*helicopters, flight testing, utility aircraft, operational effectiveness, terminal ballistics, simulation, avionics, survivability

\*uh-60m aircraft, operational suitability, black hawk helicopters, live fire testing, lut(limited user test), ballistic testing, upgrades

Fields and Groups:

010301 - Helicopters

Descriptors:

(U) \*TEST AND EVALUATION, \*HELICOPTERS, FLIGHT TESTING, UTILITY AIRCRAFT, OPERATIONAL EFFECTIVENESS, TERMINAL BALLISTICS, SIMULATION, AVIONICS, SURVIVABILITY

Identifiers:

(U) \*UH60M AIRCRAFT, OPERATIONAL SUITABILITY, BLACK HAWK HELICOPTERS, LIVE FIRE TESTING, LUT(LIMITED USER TEST), BALLISTIC TESTING, UPGRADES

**System Description:**

The UH60M Upgrade IT&E strategy will develop technical and performance data through continuous developmental and operational testing to support a total system evaluation. The DT Production Qualification Tests (PQT) using a Combined Contractor-Government approach, Live Fire Testing (LFT), and the LUT in the SIL are the principal test sources for data. The objectives of the Test and Evaluation (T&E) program are as follows:

- Provide information regarding risk and risk mitigation to decision makers and program management;
- Provide empirical data to validate and accredit models and simulations used in the evaluation;
- Assess the system technical performance and maturity; and

- Determine whether the system is operationally effective, suitable, and survivable in the intended environment.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- Helicopter- Utility- Blackhawk UH60Q Medical

**Reference** (Unruh et al., 1999):

Unruh, K. S., Craddock, J., Vogt, J., Kennedy, J., Smoot, D., Justice, J., & Fincher, S. (1999). System Evaluation Report (SER) for the UH60q Medical Evacuation Helicopter: U.S. Army Test and Evaluation Command (ATEC) (Formerly U.S. Army Operational Test and Evaluation Command- OPTEC), ATTN: CSTE-EAC-CC, Park Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB243606.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

010301 - Helicopters

060500 - Medicine and Medical Research

Descriptors:

(U) \*HELICOPTERS, \*MEDICAL EVACUATION, DECISION MAKING, DEFENSE SYSTEMS, HAZARDS, TEST METHODS, OPERATIONAL EFFECTIVENESS, ELECTROMAGNETIC RADIATION, SYSTEMS ANALYSIS

Identifiers:

(U) UH-60Q AIRCRAFT, H-60Q AIRCRAFT, SER(SYSTEM EVALUATION REPORT)

**System Description:**

The UH-60Q will replace the UH-1V and the UH-60A Medical Evacuation (MEDEVAC) aircraft to perform the aeromedical evacuation mission on the future battlefield. The UH-60Q MEDEVAC helicopter is a UH-60A helicopter modified with enhanced avionics, navigational and communication radios, an externally mounted rescue hoist, an environmental control system (ECS), and an improved medical interior system that includes oxygen and suction subsystems and the capability to provide on-board medical treatment. The UH-60Q will provide enhanced day, night (including Night Vision Goggles (NVG) aided), and adverse weather emergency movement of patients, medical personnel, equipment, and supplies; provide air crash rescue support; and support rescue of downed air crews.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- Helicopter- Utility- LUH- Lakota UH72A

**Reference** (Kastner et al., 2006):

Kastner, P., Vogt, J., Jais, C., Lukens, L., Kennedy, J., & Kennedy, J. (2006). System Evaluation Report (SER) for the Helicopter, Utility, Light UH-145 / UH-72a: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 62779194.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

**System Description:**

The UH-145 as designed and currently in use by commercial customers fulfills all of the Army's stated missions with limitations, the majority of requirements without modification, and is interoperable with civil/Government Agencies and other military aircraft. The UH-145 is capable of conducting light utility missions that include but not limited to sustainment, medical evacuation, search and rescue, aerial evacuation, casualty air movement, aerial firefighting, and command and control. Characteristics include twin engines, redundant flight control systems, autopilot, high main and tail rotor ground clearances, crashworthy fuselage, fully separated fuel system, energy absorbing seats, and a 360-degree crew field-of view. Additional safety features include advanced digital cockpit design with NVG compatibility, fully integrated digital avionics, and a sophisticated electrical system. The UH145 is certified for operations under visual flight rules (VFR) and IFR for single and dual pilots. The integrated multi-mission design of the UH-145 provides for a wide range of optional equipment such as forward looking infra-red, searchlight, emergency flotation system, currently certified and/or in production, that can be installed and operated simultaneously without interfering with other systems and equipment. Per the UH-145 operator manual, the aircraft can safely autorotate up to the maximum aircraft gross weight.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- Helicopter- Utility- LUH- Lakota UH72A

**Reference** (Kastner et al., 2007):

Kastner, P., Kennedy, J., Vogt, J., Jais, C., Lukens, L., Minjares, J., London, C., Kennedy, J., Yurechko, P., Miller, W., VanRiper, G., & Wardlow, B. (2007). System Evaluation Report (SER) for the UH-72a Lakota Light Utility Helicopter: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 71999976.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

**System Description:**

a. The LUH will be procured as a Federal Aviation Administration (FAA) Certified, Commercial/Non-Developmental Item Aircraft, and maintained in accordance with FAA, Original Equipment Manufacturer, and U.S. Army policies, regulations, and procedures. The UH72A is expected to conduct basic light utility helicopter missions and execute tasks as part of an integrated effort with other joint services, government agencies, and nongovernmental organizations. The Army determined a need for a helicopter that can provide reliable and sustainable general and administrative support in permissive environments at reduced acquisition, operating, and support costs. The UH72A is expected to respond to acts of terrorism, support disaster relief, conduct civil search and rescue, execute firefighting missions, support damage assessment, support test and training centers, perform Medical Evacuation (MEDEVAC), and provide support to counter drug operations. The LUH will provide a standardized single airframe to replace the OH-58NC and UH-1 aircraft that are currently being retired. In accordance with U.S. Code, Title 10, Section 2366, the LUH is a non-combat system; and therefore not a covered system for live fire test and evaluation and will only support operations taking place in permissive (non-hostile/non-combat) environments.

b. The UH72A is commercially available as the Eurocopter EC-145, which was FAA certified as the BK117 C-2. The aircraft was renamed the UH72A Lakota after the manufacturer customized the platform for the U.S. Army. The UH72A differs from the BK117 C-2 in that the Army has elected to purchase the baseline aircraft without certain components. Whereas this does not affect the FAA certification, the lack of certain components affects the overall evaluation. Additionally, the civilian models are configured specifically for one mission, i.e., MEDEVAC, whereas the Army will use the aircraft for multiple roles and

missions. It is FAA-certified for both single and dual pilot instrument flight rules (IFR). The UH72A combines a glass cockpit, digital autopilot, and multi-channel avionics with the design elements of the legacy BK117 airframe and hingeless four-bladed rigid rotor system. Other key features include: two Turbomeca Arriel IE2 engines; a large, flat, and side or rear-loaded cabin with space for seating up to six passengers or accommodating two litters, crew chief, and medical attendant; and safety features that include redundant flight control systems, high main and tail rotor ground clearances, and crashworthy fuselage, fuel system, and seats. Other features include a cargo hook for external loads, a hoist system for evacuation of personnel, and the ability to carry and operate a "bambi bucket" for aerial firefighting work.

c. The contractor/management team consists of the following. The EADS North America Defense is the u.s. holding company for EADS activities in North America, the prime contractor responsible for program management and contract oversight. American Eurocopter LLC is a subsidiary of Eurocopter, the largest helicopter manufacturer in the world and will manufacture the LUH, parts and components; and supply parts, after-market services, repair and overhaul, blade and composite repairs, and is responsible for certification, training, documentation and field services. Helicopter Support, Inc. (HSI), a wholly owned subsidiary of the Sikorsky Aircraft Corporation, will provide logistical fleet management and is responsible for overhaul and repair of engines, avionics, and autopilot. HSI will provide contractor field teams to perform UH72A maintenance at any location, including Army Reserve National Guard (ARNG) sites, and coordinate sustainment/depot level maintenance. WestWind Technology, Inc. will contribute experience in system engineering and helicopter modifications for the U.S. Army.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- Unmanned- UAV- TUAV Shadow

**Reference** (Helms et al., 2002):

Helms, R., Rodgers, J., Schlaffer, N., Morel, P., Bruder, B., Shvern, U., Nieto, A., & Krause, K. (2002). System Evaluation Report (SER) for the Tactical Unmanned Aerial Vehicle (TUAV): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB284334.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

010310 - Pilotless Aircraft

120500 - Computer Programming and Software

Descriptors:

(U) \*UNMANNED, \*TACTICAL AIRCRAFT, TEST AND EVALUATION, COMPUTER PROGRAMS, COMPUTERIZED SIMULATION, LOGISTICS SUPPORT, ARMY PERSONNEL, MILITARY VEHICLES, OPERATIONAL EFFECTIVENESS, RELIABILITY, ARMY EQUIPMENT, SYSTEMS ANALYSIS

Identifiers:

(U) TUAV(TACTICAL UNMANNED AERIAL VEHICLE), TLE(TARGET LOCATOR ERROR)

**System Description:**

A platoon of 22 soldiers operates the TUAV. The system is normally employed in support of a brigade. The platoon is organic to a company in the division's Military Intelligence battalion.

A TUAV system consists of five main components: air vehicles (AV), modular mission payloads, ground control stations (GCS) and related equipment, launch/recovery equipment and communications equipment.

The AV is a small, lightweight, single-engine aircraft. Wingspan is 12.3 feet; length is 11.2 feet; weight is 330 pounds. A platoon has 4 AV's (3 in the AV Trailer (AVT) with one spare in a shipping container located at the maintenance section multifunctional (MSM)). The engine uses commercial leaded fuel

(MOGAS). The air vehicle carries a modular mission payload and communications equipment for the command and imagery data links. The AV is designed to provide coverage of up to 4 hours at a range of 50 kilometers from the launch and recovery site. Its operational altitudes are 6,000 to 8,000 feet above ground level (AGL) for nighttime operations and 8,000 to 10,000 feet AGL for daytime operations. The system includes two GCSs with ground data terminals (GDTs) and one portable GCS (PGCS) with a portable GDT (PGDT). The GCS shelter houses a mission payload operator workstation and an AV operator workstation. Both the GCS and the PGCS have the capability to conduct mission planning, control launch and recovery of the AV, and control the mission payload. Through their data terminals, the GCS can operate the AV and its payload at distances of 50 km, and PGCS can operate the AV and its payload at distances of 30 km.

The AV receives commands and transmits video imagery and telemetry via analog frequency modulated radio. The GCS communicates with external agencies via tactical radios, wire, and local area network. Capabilities include secure voice, electronic dissemination and/or video. The GCS maintains specified interfaces with the Advanced Field Artillery Tactical Data System (AFATDS), All Source Analysis System (ASAS), Army Airborne Command and Control, and the Common Ground Station (CGS). The system includes four remote video terminals that receive near real time (NRT) video/telemetry from the AV. A single pneumatic launcher launches the AV. The AV lands under the control of the Tactical Automatic Landing System (TALS) on a flat surface, soccer-field sized area, cleared of obstacles. An arresting cable/tail hook system and a barrier safety net permit landing in restricted spaces. The AV can deploy a parachute for emergency recovery.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Aircraft- Unmanned- UAV- TUAV Shadow

**Reference** (Morel, 2002):

Morel, P. (2002). System Evaluation Report (SER) for the Tactical Unmanned Aerial Vehicle (TUAV). Volume 2. Survivability: U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADC069541.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

010310 - Pilotless Aircraft

Descriptors:

(U) \*DRONES, TEST AND EVALUATION, SURVIVABILITY, UNMANNED, SYSTEMS ANALYSIS

**System Description:**

Tactical Unmanned Aerial Vehicle (TUAV).

**Report Availability:**

Secret/NoForN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- AKMS-SKL

**Reference** (Elder et al., 2005):

Elder, W. A., Hawk, J., Markham, W., Wong, N., Lee, J., Powell, M., Robertson, J., Gauss, R., & Morelli, R. (2005). System Evaluation Report (SER) for the Simple Key Loader (SKL) of Army Key Management System (AKMS): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 52778044. DTIC ADB313109.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

250200 - Radio Communications

250500 - Command, Control and Communications Systems

120800 - Computer Systems Management and Standards

Descriptors:

(U) \*COMMAND CONTROL COMMUNICATIONS, \*ELECTRONIC SECURITY, \*SECURE COMMUNICATIONS, \*TACTICAL DATA SYSTEMS, \*STRATEGIC COMMUNICATIONS, TEST AND EVALUATION, DATA MANAGEMENT, PERFORMANCE(ENGINEERING), ARMY EQUIPMENT, SYSTEMS ANALYSIS, WORK STATIONS, OPERATIONAL EFFECTIVENESS, SURVIVABILITY, COMPUTER PROGRAMS

Identifiers:

(U) \*SIMPLE KEY LOADER, DTD(DATA TRANSFER DEVICE), SKL(SIMPLE KEY LOADER), AKMS(ARMY KEY MANAGEMENT SYSTEM)

**System Description:**

The purpose of the SKL is to provide storage and distribution of COMSEC/EP fill data, and Sal information for tactical and/or strategic secure communications systems, and to keep audit trail records. The SKL is considered an Associated Support Items of Equipment for many other systems besides the AKMS platforms. It is a user-level device located at the sustaining base and throughout the theater where secure communications are needed.

The hardware is a ruggedized hand-held device:

(1) Size: 7.4 inches x 3.75 inches x 1.5 inches.

(2) Weight: 18.25 ounces without battery, 27.4 ounces with Li-ion battery.

(3) Memory: Storage Random Access Memory (RAM)-64 Megabytes (MB) (Synchronous Dynamic Random Access Memory (SDRAM)), Working SDRAM, Flash-64MB (Read-only Memory (ROM)).

(4) Display: Quarter Video Graphics Array (QVGA), 65K Color Transflective HR-TFT Liquid Crystal Display (LCD), 3.5 inches diagonal; Light Emitting Diode (LED) backlit, manual brightness control, color mapping for night vision goggles use.

(5) User Input: Stylus-Two high-resolution inductive sensor ruggedized styli; four "umbered" user buttons; four directional and one "Enter" button; two screen brightness control buttons; Power On/Off button; covered and recessed "Zeroize" button.

(6) Crypto Ignition Key (CIK).

(7) Input/Output: CIK connector, Fill Port, two Universal Serial Bus (USB) port connectors-hub, keyboard, mouse, and SKL-to-SKL connections.

(8) Processor-32-bit Intel XScale CPU (400 megahertz (MHz)).

The software consists of Windows CE 4.1 operating system and applications compatible with Common Tier 3 and Data Transfer Device (DTD) software. The applications support key management and interaction with Tiers 2 and 3 data storage.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Artillery- 105mm- Computer- GLPS

**Reference** (Crise et al., 1999):

Crise, P., DeFranks, S., Price, L., Smoot, D., & Mercer, B. (1999). System Evaluation Report (SER) for the Gun Layering and Positioning System (GLPS): U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 92118089 / 99-DTOT-1752A. DTIC ADB245781.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

170700 - Navigation and Guidance

190600 - Guns

Descriptors:

(U) \*SYSTEMS ANALYSIS, OPERATIONAL EFFECTIVENESS, GLOBAL POSITIONING SYSTEM, RANGE FINDING, GYROSCOPES, OPTICAL INSTRUMENTS

Identifiers:

(U) \*GUN LAYING AND POSITIONING SYSTEM, GLPS(GUN LAYING AND POSITIONING SYSTEM), LASER RANGE FINDERS, MNS(MISSION NEED STATEMENT), ORD(OPERATIONAL REQUIREMENTS DOCUMENT)

**System Description:**

The GLPS consists of four active components, a transport case and a tripod. The tripod mounts an Azimuth Gyroscope, Electronic Digital Optical Instrument (Theodolite), Laser Range-Finder (LRF), and a Precision Lightweight Global Positioning System (GPS) Receiver (PLGR). The gyroscope, optical instrument, and LRF are fully integrated with an embedded microprocessor, plus a control and display system for the computation and digital display of gunlaying and positioning data. The PLGR is powered by its own battery, which is mounted separately on the tripod. A standard RS-232 data interface cable is used to connect to the other GLPS components. The overall GLPS is powered by a rechargeable and/or replaceable battery source. Additional subcomponents include an illuminating target rod, a battery charger, power conditioner (as required), a winterization kit (as required), protective cover, and the electrical cables necessary to make all connections. The GLPS is capable of being carried in an operational configuration and operated by a single soldier. It is normally stowed in the transport case provided for transport in military vehicles, ships, or helicopters, and is also air deliverable.

The GLPS is designed to give a towed firing battery all-weather, autonomous positioning and directional capability. The GLPS enables rapid determination of azimuth, firing deflection and position (coordinates and altitude) for each howitzer from one centrally located Orienting Station (OS). Exact position data are derived from the PLGR. If the PLGR is not functioning, the GLPS can still establish a position location using a backward Polar Plot method.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Artillery- 155mm- Charge- MACS XM231

**Reference** (Baxivanos et al., 1999):

Baxivanos, V., Clowes, C., DeFranks, S., Shandle, G., Toso, A., & Abeyta, R. (1999). System Evaluation Report (SER) for the Modular Artillery Charge System (MACS) XM231: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. FSTD, Ft. Sill, OK. DTIC ADB249574

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

190100 - Ammunition and Explosives

190600 - Guns

Descriptors:

(U) \*PROPELLING CHARGES, \*GUN PROPELLANTS, RISK, DECISION MAKING, SURVIVABILITY, SPECIFICATIONS, PERFORMANCE(ENGINEERING), FIRING TESTS(ORDNANCE), CLASSIFICATION, ARTILLERY AMMUNITION, FIRING TABLES

Identifiers:

(U) MACS(MODULAR ARTILLERY CHARGE SYSTEM), XM-231 PROPELLANTS, XM-232 PROPELLANTS

**System Description:**

The MACS is part of a combat/combat support "system of systems" consisting of propellant charges, projectiles, fuzes, and a howitzer cannon. It provides for artillery close, tactical, and operational fires during both offensive and defensive combat operations.

**Propellant.** The MACS consists of two solid propellant charge increments, the XM231 and XM232. The XM231 is designed as a "low zone" propelling charge which provides zoning from Zone 1 to Zone 2. The XM232 is a "high zone" propelling charge which provides zoning from Zone 3 to Zone 5 in 39 Caliber systems, and Zone 3 to Zone 6 in extended range (52+ Caliber) cannons. Both MACS increments have a rigid combustible case, granular main charge propellant, and use center core ignition. The increments also feature bi-directional ignition, therefore charges can be loaded in either direction. The cases are color-coded and feature distinctive markings and shape features to enable soldiers to distinguish between them in conditions of low visibility and in climates requiring heavy gloves.

**Packaging.** The packing canisters are derived from the standard PA103 currently used with the M203A1 charge. Improved features include lids which are easier to open, increment sleeves to facilitate unpacking and loading into the cannon, and reduction of the hazards of unintended ignition due to attack or accident. The XM231 propellant is to be packaged with four increments per canister. A protective coating applied to the case and Mylar™ seals covering the igniter bags will permit extended storage outside of the canister to facilitate loading on the Crusader system. Ignition is provided by conventional primers.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Artillery- 155mm- Charge- MACS XM232

**Reference** (Baxivanos, 2001):

Baxivanos, V. (2001). System Evaluation Report (SER) for the Modular Artillery Charge System (MACS) XM232: U.S. Army Evaluation Center (AEC), Aberdeen Proving Ground, MD. Report #: 12118535 / 00-OT-FS-1787. DTIC ADB268917.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

190600 - Guns

191000 - Ballistics

Descriptors:

(U) \*INTERIOR BALLISTICS, \*HOWITZERS, COMPUTERIZED SIMULATION, PARAMETRIC ANALYSIS, DECISION MAKING, LIFE EXPECTANCY(SERVICE LIFE), HAZARDS, MILITARY VEHICLES, OVERPRESSURE, OPERATIONAL EFFECTIVENESS, RELIABILITY, LOGISTICS, OVERLAP, BLAST, ARTILLERY, FIELD CONDITIONS, GUN PROPELLANTS, MUZZLE VELOCITY, AMMUNITION CASES

Identifiers:

(U) MACS(MODULAR ARTILLERY CHARGE SYSTEM), XM232 MODULAR ARTILLERY CHARGE SYSTEM, 155mm HOWITZER, PRESSURE WAVES, MODULAR CHARGES, BLAST OVERPRESSURE, CANNONS, COOK-OFF, EMBERS, RATE OF FIRE, SUITABILITY, XM232 CANNISTERS, TRANSPORTABILITY, TUBE WEAR

**System Description:**

The MACS is part of a combat arms "system of systems" consisting of propellant charges (MACS), projectiles, fuzes, and howitzer cannon. This system provides artillery fire in support of combat operations.

1. Propellant. The MACS consists of two types of solid propellant charge increments, the M231 and XM232, with associated packaging. Multiples of these two types of increments correspond to current bag propellants/charges as shown in figure 1-1. The M231 is designed as a "low zone" propelling charge, providing Zones 1 and 2. The XM232 is a "high zone" charge, providing Zones 3 through 5 in 39 caliber systems. (XM232 Zone 6 will be used only in 52+ caliber systems and provides a capability beyond that of the M203A1 propellant. Because it cannot be used in 39-caliber systems, it is not addressed in this report.) Both types of MACS increments have a rigid combustible case, have a granular main charge propellant, and use center core ignition. The increments feature bidirectional ignition, allowing increments to be loaded in either direction. The cases are color-coded and feature distinctive markings and shape features to enable soldiers to distinguish between the two types of increments in conditions of low visibility and in climates requiring the use of heavy environmental protective gloves.

2. Packaging. The PA103E2 packing canisters are derived from the PA103 canister currently used with the M203A1 charge. Improved features include lids that are easier to open, sleeves to facilitate the unpacking and loading of charge increments into the cannon, and other improvements that reduce the likelihood of unintended ignition due to attack or accident. The XM232 propellant is packaged with five increments per PA103E2 canister. Individual increments have a protective coating applied to the case and Mylar™ seals covering the igniter bags, permitting extended storage outside the canister. This improves propellant accessibility and facilitates loading into the Crusader system.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Artillery- 155mm- Computer- TADS

**Reference** (Smith, 2007):

Smith, A. E. (2007). System Evaluation Report (SER) for the M777A2 LW155 Towed Artillery Digitization System (TADS) / Abbreviated (ASER): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB326980.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

190500 - Fire Control and Bombing Systems

190600 - Guns

140200 - Test Facilities, Equipment and Methods

Descriptors:

(U) \*FIRE CONTROL SYSTEMS, \*HOWITZERS, \*TOWED VEHICLES, TEST AND EVALUATION, SURVIVABILITY, OPERATIONAL EFFECTIVENESS

Identifiers:

(U) \*TADS(TOWED ARTILLERY DIGITIZATION SYSTEM), \*DFCS(DIGITAL FIRE CONTROL SYSTEM)

**System Description:**

The Block 1a Digital Fire Control System (DFCS) is an integrated fire control system providing an on-board fire command display, position navigation and location, gun pointing and information display. With the installation of the Platform Integration Kit (PIK) and the future AFATDS 6.4.0.1, DFCS is capable of firing XM982 Excalibur missions. In addition, the M777A2 uses JVMF rather than Gun Display Unit (GDU) as basis for communications with AFATDS. JVMF offers significant operational advantages over the GDU based software and enhances the LW155 platform automated capability with the fire direction

center. Finally, the M777A2 will provide crew controls and displays, position location, navigation, gun tube laying aids, system command and control functions, digital communications, power supply/power management, and Built-In-Test (BIT).

**(1) Hardware.**

**(a) Computer.** The DFCS Central processing unit provides processing, data storage and electronics integration of the total system.

**(b) Navigation System (NS).** The navigational system provides navigational data to the mission computer. The NS consists of the Inertia Navigation Unit (INU), Vehicle Motion Sensor (VMS), and Defense Advanced Global Positioning System Receiver (DAGR).

**(c) Section Chief Computer Display Unit (SCCDU).** The primary system control and navigation interface displays deflection and quadrant elevation plus laying signals.

**(d) Gunner/Assistant Gunner Display.** Displays that reflect deflection and quadrant elevation plus laying signals used to lay the weapon in direct and indirect fire mode.

**(e) Vehicle Motion Sensor (VMS).** The VMS provides pointing references and navigation outputs for the DFCS.

**(f) Army Single Channel Ground and Airborne Radio System (SINCGARS).** The SINCGARS facilitates digital communications for the M777A2.

**(g) Defense Advanced GPS Receiver (DAGR).** The DAGR provides position location, pointing references, and navigation outputs for the DFCS.

**(h) Power Supply.** The M777A2 power source.

**(i) EPIAFS/PIK.** Enhanced Portable Inductive Artillery Fuze Setter. EPIAFS consists of a setter, a Platform Integration Kit (PIK) and cables. The system is used to transfer mode and time-of-flight information to standard inductive fuzes and initialize the Excalibur projectile. When the setter is not connected via the cable to the PIK, EPIAFS is identical to the operation of the PIAFS. When the setter is cabled to the PIK, it receives power and mission data from the weapon system. This method allows direct transmission of data from the weapon system to the setter. Operator entry in this mode is limited to pushing the enter button to start the setter and to confirm the response from the projectile or fuze.

**(2) Software.** The Block 1a DFCS software (Build D2.B7.R5) is the application software that provides crew controls and displays, position location, point-to-point navigation, gun tube laying aids, system command and control, digital communications, power supply, power management, and BIT. Preeminent to the M777A2 is the inductive fuze setter capability provided by EPIAFS. The DFCS will interface with AFATDS using Single Channel Ground and Air Radio System - Advanced Systems Improvement Program (SINCGARS-ASIP) radio or twoway wire line, by means of a Tactical Communications Interface Module (TCIM-TACLINK 3000) using MIL-STD-188-220 and MIL-STD-6017 (TACFIRE) communication and message protocols via wire/radio using JVMF protocol. The software consists of two main Computer Software Configuration Items (CSCIs): the Operating System (OSC) CSCI and the Indirect Fire Control (IFC) CSCI.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Artillery- 155mm- Fuze- M767

**Reference** (Eimer and Abeyta, 1999):

Eimer, D., & Abeyta, R. (1999). System Evaluation Report (SER) for the Fuze, Electronic Time (ET), M767: U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 93208157. DTIC ADB249226.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*ELECTRONIC EQUIPMENT, \*ARTILLERY AMMUNITION, \*PROJECTILE FUZES, \*ELECTRIC FUZES(ORDNANCE), ELECTRONICS, MATERIEL, SURVIVABILITY, TIME, SYSTEMS ANALYSIS, HIGH EXPLOSIVES

Identifiers:

(U) EXPORT CONTROL, M-767 FUZES, NBC(NUCLEAR BIOLOGICAL AND CHEMICAL)\*ARTILLERY FUZES, SER(SYSTEM EVALUATION REPORT)

**System Description:**

The M762/M767 ET fuze series is intended to be an accurate, reliable, and low-cost artillery time fuze. The fuze has both an auto-set capability for use with future automatic loading howitzers and has a handset capability to provide means for manual setting with conventional (nonautomated) US and North Atlantic Treaty Organization (NATO) weapon systems. Auto setting should provide a direct automatic data link between the fuze and the fire control system and promote the incorporation of mechanical projectile handling techniques to achieve increased rates of fire, reduce system response time, simplify operations, and reduce human error for fuze setting.

The fuze will provide a 199.9-second time fuze capability for all fielded and developmental 105mm and 155mm artillery projectiles and propelling charges. The M762 (materiel released in February 1994) is used with base-ejecting cargo projectiles. The M767 is similar to the M762 except for the addition of a booster cup which enables the M767 to be used with HE rounds and other burster type projectiles.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Artillery- 155mm- Fuze- MOFA

**Reference** (Bramwell et al., 1999):

Bramwell, B., Muskoph, E., DeFranks, S., & Abeyta, R. (1999). System Evaluation Report (SER) for the XM782 Multi-Option Fuze for Artillery (MOFA): U.S. Army Test and Evaluation Command (ATEC) (Formerly U.S. Army Operational Test and Evaluation Comand- OPTEC), ATTN: CSTE-EAC-CC, Park Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB249688.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*ARMY EQUIPMENT, \*ARTILLERY, TEST AND EVALUATION, REQUIREMENTS, DECISION MAKING, SURVIVABILITY, RELIABILITY, DOCUMENTS, SYSTEMS ANALYSIS, IMPACT FUZES

Identifiers:

(U) EXPORT CONTROL, MOFA(MULTI-OPTION FUZE FOR ARTILLERY), XM-782 FUZES

**System Description:**

The XM782 MOFA is for use on bulk-filled artillery projectiles. It is an Acquisition Category (ACAT) III program. The XM782 MOFA will include the required functioning characteristics for bursting type munitions in a standard fuze contour with only an autsetting capability. The XM782 MOFA will perform all functions needed for bulk-filled artillery projectiles and will be compatible with future automated howitzers to achieve the required rates of fire, e.g., the 155mm Crusader System. The XM782 MOFA will be capable of precision time, proximity (PROX), point detonating (PD), and delay functioning modes. The fuze will be inductively autset using an autset technique that complies with North Atlantic Treaty Organization (NATO) Standardization Agreement (STANAG) 4369. The MOFA will provide electronic feedback to the setter indicating whether proper fuze setting has taken place. The XM782 MOFA will be employed in geographical areas falling under hot, basic, and cold climatic environments.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Artillery- 155mm- Fuze- PDDL

**Reference** (Smith et al., 2001):

Smith, A. E., Abeyta, R., & Defranks, S. (2001). System Evaluation Report (SER) for the Fuze, PD/Delay (PDDL), MK399 Mod 1 Materiel Release: U.S. Army Evaluation Center (AEC), Aberdeen Proving Ground, MD. Report #: 11658499. DTIC ADB267529.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*POINT DETONATING FUZES, ACCEPTANCE TESTS, MATERIEL, TERRAIN, OPERATIONAL EFFECTIVENESS, SYSTEMS ANALYSIS, ARTILLERY AMMUNITION, URBAN AREAS, PROJECTILE FUZES, DELAY ELEMENTS(EXPLOSIVE)

Identifiers:

(U) MARK-399 MOD-1 POINT DETONATING FUZE, DELAY ARTILLERY FUZES, M78/M78A1 CONCRETE PIERCING, MATERIEL RELEASE

**System Description:**

The MK399 MOD 1 Fuze has a steel penetrator body that can be used by artillery weapons against urban area targets. It can be set to function PD or delay. In the delay mode, the fuze is designed to penetrate urban structures; i.e., buildings and bunkers, and function the projectile inside the structure. In the superquick mode (PD), the fuze functions as a standard PD fuze which is also useful for ranging in on targets.

The fuze has an aluminum PD head assembly threaded onto a hardened steel body. Internally, the fuze is composed of a PD head assembly, selector switch assembly (screwdriver or M18 Fuze Wrench operated), pyrotechnic delay assembly, the MK 49 MOD 2 safe and arming (S&A) device, two MK 8 leads, and a booster pellet.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Artillery- 155mm- Projectile- RADAM

**Reference** (Clowes et al., 2000):

Clowes, C., DeFranks, S., Abeyta, R., Flory, T., & Teletski, L. (2000). System Evaluation Report (SER) for the Remote Area Denial Artillery Munition (RADAM): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 03408332.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

**System Description:**

The Remote Anti-Armor Mine (RAAM) system projectiles M718 and M741 were fielded beginning in 1982. Each RADAM 155mm projectile contains nine AT mines which have magnetic sensors fuzes and self-destruct (SD) timers (4.0- or 48.0hour SD) enabled at ejection and fully armed approximately 1 minute after coming to rest after impact. The M718A1 (48-hour SD) and M741A1 (4-hour SD) were subsequently fielded after design changes to allow mines to become fully armed immediately upon cessation of motion. This enhancement was implemented in order to provide a capability to employ artillery-delivered AT mines directly in front of, or in the midst of, moving armored units. Two mines of each RAAM nine-mine payload were equipped with an antisturbance feature designed to function the mine upon any change in attitude/orientation.

The Area Denial Artillery Munition (ADAM) 155mm projectiles M692 (48-hour SD) and M731 (4-hour SD) were first fielded in 1980. Each projectile contains 36 wedge/pie-shaped AP mines which release tripline sensors approximately 1 minute after ejection. Each mine releases up to seven spring-loaded bobbins, each of which unravels a thread attached to a breakwire in the mine body. Depending on orientation upon tripline release, two to four bobbins may deploy up to 30 feet of thread to form a target sensing area around the mine. Every AP mine is equipped with an antisturbance switch/feature.

The RADAM system projectile utilizes five downloaded ADAM AP mines from M692/731 projectiles, downloaded RAAM projectile bodies, and seven of each nine downloaded RAAMAT mines. No mine modifications are being made, and the RAAM projectile bodies are simply being repackaged with a pusher plate for the five ADAM-AP mines clustered around an arming rod fitted near the ogive, with the seven RAAM-AT mines between a second pusher/spacer plate and the projectile base plate. Standard mechanical (M577) or electronic (M764) time fuzes will be used to initiate the RADAM expulsion charge.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Artillery- 155mm- Projectile- SADARM

**Reference** (Muskopf et al., 1998):

Muskopf, E., Mercer, R., Huntley, D., Cheever, H., & Abeyta, R. (1998). System Evaluation Report (SER) for the Sense and Destroy Armor Munition (SADARM) (U): U.S. Army Test and Evaluation Command (ATEC) (Formerly U.S. Army Operational Test and Evaluation Command- OPTEC), ATTN: CSTE-EAC-CC, Park Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADC061528.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

190100 - Ammunition and Explosives

191000 - Ballistics

Descriptors:

(U) \*COMBAT EFFECTIVENESS, \*SURVIVABILITY, \*ANTIARMOR AMMUNITION, \*PROJECTILES, LOGISTICS SUPPORT, KILL PROBABILITIES, OPERATIONAL EFFECTIVENESS, RELIABILITY, LETHALITY, HIT PROBABILITIES

Identifiers:

(U) SADARM(SENSE AND DESTROY ARMOR), M-898 PROJECTILES, 155-MM PROJECTILES, COUNTERFIRE

**System Description:**

Sense and Destroy Armor Munition (SADARM).

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this

document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ASLMS

**Reference** (James et al., 2004):

James, K., Juba, A., Emery, B., Chan, C., & Foster, M. (2004). System Evaluation Report (SER) for the Authorized Stockage List Mobility System (ASLMS): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 42587892. DTIC ADB302755.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

130400 - Containers and Packaging

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*ARMY EQUIPMENT, \*CONTAINERS, \*STORAGE, \*SPARE PARTS, MOBILITY, LOADING(HANDLING), OPERATIONAL EFFECTIVENESS, REPAIR, PROTECTIVE EQUIPMENT, CONTAINERIZING

Identifiers:

(U) ASLMS(AUTHORIZED STOCKAGE LIST MOBILITY SYSTEM)

**System Description:**

The ASLMS has standardized, side-opening and expandable containers with integrated, modular drawer storage, cabinet, bin, shelf, and rack storage systems for full containerization of Authorized Stockage List (ASL) repair parts. The ASLMS containers provide protection from pilferage and the environment for repair parts. The ASLMS uses the Heavy Expanded Mobility Tactical Truck-Load Handling System (HEMTT-LHS) and the Palletized Load System (PLS) trailer as its prime mover. The ASLMS containers are air deployable and have external dimensions that, when configured together to form an 8-foot by 8-foot by 20-foot envelope. Container types include bulk and parts storage. The parts storage container has a mix of modular drawer, cabinet, shelf, bin, and high security storage systems. Bulk storage containers contain adjustable rack and hazardous material spill containment systems. Both container types come with an externally erected environmental protection cover (EPC) that is stored inside the container when not in use. ASLMS includes internally connected, moveable lights that can be mounted under the EPC. The fixtures contain both blackout and white lighting capability.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ASWDS

**Reference** (Smyers et al., 2001):

Smyers, P., Landy, K., Matthews, S., Walker, T. R., Rajkowski, E., Mallamo, J., & Moul, T. (2001). System Assessment (SA) for the Airborne Scraper and Water Distribution System (ASWDS) Type Classification - Generic Decision: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB273069.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

130200 - Civil Engineering

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*WATER DISTRIBUTION, \*SCRAPERS, LOGISTICS SUPPORT, SURVIVABILITY, MILITARY STANDARDS, HUMAN FACTORS ENGINEERING, RELIABILITY, AIR DROP OPERATIONS, MILITARY PROCUREMENT, AIR TRANSPORTABLE EQUIPMENT

Identifiers:

(U) \*ASWDS(AIRBORNE SCRAPER AND WATER DISTRIBUTION SYSTEM), ROAD SCRAPERS

**System Description:**

The ASWDS, with airborne and airmobile capabilities, will consist of a single prime mover that can be connected to either a 2,500-gallon (minimum) water distributor or an 11 cubic- yard earth scraper. The commercial ASWDS will have four variants, all with a high degree of commonality. The primary differences, based on functionality (scraper or water distributor) and transportability (sectionalization or nonsectionalization), are as follows:

(1) Type I: A nonsectionalized 2,500-gallon water distributor with the capability of being air transported and airdropped as one package less the rollover object protective structure (ROPS)/falling object protective structure (FOPS).

(2) Type II: A sectionalized 2,500-gallon water distributor with the capability of being transported, airdropped, and separated into separate packages for sling-load helicopter movement/delivery by a CH-47.

(3) Type III: A nonsectionalized 11-cubic-yard scraper with the capability of being air transported and airdropped as one package less ROPS and FOPS.

(4) Type IV: A sectionalized 11-cubic-yard scraper with the capability of being transported, airdropped, and separated into separate packages for sling-load helicopter movement/delivery by a CH-47.

The existing system has the commercial designation of model 613B. The new rebuy has the commercial designation model 613C. Both models have the same capacity, load, and productivity. Primary differences include:

(1) The engine has been changed from model 3408 to model 3116. The newer model 3116 engine has 3 percent greater fuel efficiency, less wear, and less noise.

(2) The 613C has an electronic monitoring system (lacking on the 613B).

(3) The 613C includes standard radial tires (lacking on the 613B).

(4) The 613C has higher empty and gross machine weights.

(5) The human factors element is reportedly improved with reduced lever effort, and several gages and switches have been moved for easier access.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ATLAS II

**Reference** (McMahon, 2005):

McMahon, R. W. (2005). System Evaluation Report (SER) for the All-Terrain Lifter, Army System (ATLAS) II / Abbreviated (ASER): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 51588002.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

**System Description:**

ATLAS II is designed to load and unload ammunition, supplies, and equipment onto and from various modes of transport. It facilitates loading and unloading of various unit deployment containers (Quadruple Containers), Internal Aircraft/Helicopter Slingable Unit 60 inches and 90 inches tall containers and TRICON© containers). ATLAS II handles United States Air Force (USAF) 463L pallets with 10,000 pound

gross weight loads. It also transfers palletized or break-bulk cargo onto vehicles from aircraft. It is equipped with a telescopic boom that can quickly lift pallets and position them on military and commercial semitrailers and trucks. ATLAS II handles a variety of industry standard pallets with the 6,000 pound fork carriage. The 10,000 pound carriage with fork-tine rollers (an Additional Authorized List item) enables ATLAS II forklifts to directly load or unload 463L pallets onto or off of all USAF cargo transport aircraft ramps without USAF K-loaders. ATLAS II inserts and extracts 40 inches by 48 inches pallets from containers without a ramp. The telescopic boom safely extracts all pallets from inside grounded or chassis mounted 20-foot long International Standardization Organization (ISO) containers. Pallets positioned in the front half of 40-foot long ISO containers can be un-stuffed. Palletized ordnance and supplies can be loaded and unloaded from: (a) 20-foot long containers; (b) Half-height ammunition containers; (c) Palletized Loading System flat-racks; and (d), Container Roll-In/Out Platform flat-racks.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- AVCATT-A

**Reference** (Mraz et al., 2003):

Mraz, A., Strange, R., Gauss, B., Kennedy, J., & Stinnette, E. (2003). System Evaluation Report (SER) for the Aviation Combined Arms Tactical Trainer - Aviation Reconfigurable Manned Simulator (AVCATT-a): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 33188882. DTIC ADB293551.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

010200 - Military Aircraft Operations

200300 - Electricity and Magnetism

Descriptors:

(U) \*FLIGHT SIMULATORS, LOGISTICS SUPPORT, DECISION MAKING, SURVIVABILITY, TRAINING DEVICES, INTEROPERABILITY, OPERATIONAL EFFECTIVENESS, AERONAUTICS, RELIABILITY, ARMY EQUIPMENT, MILITARY CAPABILITIES, SYSTEMS ANALYSIS, TACTICAL AIRCRAFT, MANNED, ELECTROMAGNETIC COMPATIBILITY

Identifiers:

(U) EXPORT CONTROL, SCT(SYSTEM COMBINED TEST), IOT(INITIAL OPERATIONAL TEST), AVCATT(AVIATION COMBINED ARMS TACTICAL TRAINER), CCTT(CLOSE COMBAT TACTICAL TRAINER)

**System Description:**

AVCATT-A provides a virtual environment in which Army helicopter crews and units can perform selected collective tasks in combined arms exercises. It supports institutional, organizational, and sustainment training for the active Army, Army Reserve, and National Guard aviation units. The system is housed in two commercial trailers and consists of six manned simulators, reconfigurable to replicate anyone of five aircraft. These aircraft are: Apache (AH-64A), Kiowa Warrior (OH-58D), Blackhawk (UH-60A), Chinook (CH-47D), and Longbow Apache (AH-64D).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- BASIC P3I

**Reference** (Smyers et al., 2001):

Smyers, P., Juba, A., Zwicke, R., Cook, F., & Kocher, T. (2001). System Assessment (SA) for the Body Armor Set, Individual Countermine Preplanned Product Improvement (BASIC P3I) (Full Rate Production Decision and Update to Type Classification System Evaluation Report) U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. AEC, APG, MD. DTIC ADB268049.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

150606 - Land Mine Warfare

190400 - Armor

230400 - Protective Equipment

Descriptors:

(U) \*COMBAT EFFECTIVENESS, \*BODY ARMOR, \*COUNTERMINING, ARMY RESEARCH, RISK, DECISION MAKING, SURVIVABILITY, ARMY PERSONNEL, MINE DETECTION, MINE CLEARANCE, BLAST, ANTIPERSONNEL MINES, JOINT TEST AND EVALUATION

Identifiers:

(U) BASIC P3I(BODY ARMOR SET INDIVIDUAL COUNTERMINE PREPLANNED PRODUCT IMPROVEMENT), PQT(PRODUCTION QUALIFICATION TEST)

**System Description:**

The BASIC P3I, an Acquisition Category (ACAT) IV program, is an armored clothing system for use by personnel performing mine clearing tasks. The ensemble expands on the original BASIC concept with additional protection provided by a helmet cover, a face shield, a collar, a vest cover with plate, upper and lower arm protection, trousers, groin plate, and overboots. The ensemble is worn with the PASGT helmet, PASGT vest, and standard combat boots. The Special Protective Eyewear, Cylindrical System and the Ballistic/ Laser Protective Spectacle P3I eyewear worn with the original BASIC were replaced with the face shield.

The soft ballistic material in the BASIC P3I components used in the FOT is Dupont style 707, 600 denier, 4.78 ounces per square yard, KM2 aramid cloth. The upper leg and upper arm protection is provided by 40 plies of the aramid cloth; the lower leg and lower arm protection is 30 plies. The collar is graduated from 40 to 14 plies of the aramid cloth as it comes around from the front of the throat to the side; the outer shell is one layer of Cordura™ nylon. The inner and outer shells of the vest cover are one layer of Cordura™ nylon and the ballistic inserts (front and back) are 13 plies of the aramid cloth. The front panel of the vest cover contains a pocket for the placement of a removable, hard armor plate (ceramic core between layers of composite material) that is intended to provide additional protection to the heart and lungs. The weight of the current hard chest plate is 3.75 to 4.25 pounds, size medium, which is less than the previous plate weight of 6.25 to 6.8 pounds, size medium. The helmet cover overshell is cotton/nylon twill, the same fabric as the Battle Dress Uniforms (BDUs), with a ballistic insert of 30 plies of the aramid cloth. The protective overboot has an upper section constructed of an outer fabric of Cordura™ nylon laminated to two layers of aramid cloth forming the inside lining; the blast-resistant components are composed of a composite aramid cloth insole and an aluminum v-shaped blast deflector coupled with an aluminum honeycomb attenuator molded into a vented (cleated style), directmolded, vulcanized rubber sole. The faceshield is made of polycarbonate material that is approximately 0.25 inch thick.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- BASIC-P3I

**Reference** (Smyers et al., 2000):

Smyers, P., Zwicke, R., Hannah, L., Finkel, M., Cook, F., Kocher, T., Davison, A., Murnyak, G., & Stevens, J. (2000). System Evaluation Report (SER) for the Body Armor Set, Individual Countermine, Preplanned Product Improvement (BASIC P3I): U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 82536070 / SER/EDP 98-06, U-41551. DTIC ADB254503.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

150606 - Land Mine Warfare

190400 - Armor

230400 - Protective Equipment

Descriptors:

(U) \*COMBAT EFFECTIVENESS, \*ANTIPERSONNEL MINES, \*BODY ARMOR, ARMY RESEARCH, RISK, SURVIVABILITY, ARMY PERSONNEL, MINE DETECTION, MINE CLEARANCE, BLAST, JOINT TEST AND EVALUATION, COUNTERMINING

Identifiers:

(U) BASICP3I(BODY ARMOR SET INDIVIDUAL COUNTERMINE PREPLANNED PRODUCT IMPROVEMENT), PQT(PRODUCTION QUALIFICATION TEST)

**System Description:**

The BASIC P3I, an Acquisition Category (ACAT) IV program, is an armored clothing system for use by personnel performing mine clearing tasks. The ensemble expands on the original BASIC concept with additional protection provided by a helmet cover, a face shield, a collar, a vest cover with plate, upper and lower arm protection, trousers, groin plate, and overboots. The ensemble is worn with the PASGT helmet, PASGT vest, and standard combat boots. The Special Protective Eyewear, Cylindrical System and the Ballistic/Laser Protective Spectacle P3I eyewear worn with the original BASIC was replaced with the face shield. Other BASIC components have changed for the BASIC P3I concept. The ballistic material is 850 denier, 6.8 ounces per square yard, KM2 Kevlar™. The upper leg and upper arm protection is provided by 30 plies of Kevlar™ and the lower leg and lower arm protection is 23 plies. The collar is graduated from 30 to 10 plies of Kevlar™ as it comes around from the front of the throat to the side; the outer shell is one layer of Cordura™ nylon. The inner and outer shells of the vest cover are one layer of Cordura™ nylon and the ballistic inserts (front and back) are ten plies of Kevlar™. The front panel of the vest cover contains a pocket for the placement of a removable, hard (aluminum oxide) armor plate that is intended to provide additional protection to the heart and lungs. The helmet cover overshell is cotton/nylon twill, the same fabric as the Battle Dress Uniforms (BDUs), with a ballistic insert of 24 plies of Kevlar™. The protective overboot has an upper section constructed of an outer fabric of Cordura™ nylon laminated to two layers of Kevlar™ forming the inside lining; the blast resistant components are composed of a composite Kevlar™ insole and an aluminum v-shaped blast deflector coupled with an aluminum honeycomb attenuator molded into a vented (cleated style), direct molded, vulcanized rubber sole.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- BCIS

**Reference** (Garfinkel et al., 2002):

Garfinkel, G. S., Bristow, S., Sheroke, B., Anderson, W., Morel, P., Schlaffer, N., & Shey, S. (2002). System Assessment (SA) for the Battlefield Combat Identification System (BCIS): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. DTIC ADB284220

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)  
Fields and Groups:

170800 - Miscellaneous Detection and Detectors

Descriptors:

(U) \*IDENTIFICATION SYSTEMS, \*SYSTEMS ANALYSIS, TEST AND EVALUATION, BATTLEFIELDS,  
WEAPON SYSTEMS, OPERATIONAL EFFECTIVENESS, VISIBILITY

Identifiers:

(U) BCIS(BATTLEFIELD COMBAT IDENTIFICATION SYSTEM)

**System Description:**

BCIS is a point of engagement, question and answer system that uses a millimeter wave interrogator-transponder system to provide a "Friend," "Unknown," or "Friend at Range" identification during all visibility (rain, smoke, fog, dust, etc.) and terrain conditions. BCIS Tactics, Techniques and Procedures (TTPs) instruct crews to interpret a "Friend" response as indicating the target is a friendly platform with a BCIS transponder. "Unknown" and "Friend at Range" responses indicate the target does not have a working BCIS transponder and may be either an enemy or a friend. (Example: a "Friend at 2.3" response means there are no BCIS transponders within 50 meters of the Laser Range Finder (LRF) estimated range to the target and the nearest transponder within the field of view of the interrogator is 2.3 kilometers from the interrogator.)

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- BNBFBSSBG

**Reference** (Barrett, 1998):

Barrett. (1998). System Evaluation Report (SER) for the Ballistic/Non-Ballistic Face and Body Shields, and Ballistic Shin Guards (Bnbfbssbg): U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 82476045 / SER 98-08.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

**System Description:**

Ballistic and Non-Ballistic Face and Body Shields and the Ballistic Shin Guards are Commercial-off-the-Shelf (COTS) items currently being used by other law enforcement agencies. The ballistic body shields are made from Spectra® Shield, the ballistic shin guards are made from Kevlar® KM2 and the ballistic face and shield and non-ballistic face and body shields are made from polycarbonate materials. These items are to augment current civil disturbance military equipment and provide the soldier with face, torso and leg protection from a wide range of threats (e.g. debris, liquids, hand thrown objects, and direct/indirect fire). The items are designed to be ambidextrous and accommodate the 5th percentile female to the 95th percentile male.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Boat- Barge- BD

**Reference** (Stolarz et al., 1998):

Stolarz, B., Player, F., & Shipe, R. (1998). System Evaluation Report (SER) for the 115-Ton Barge Derrick (BD), 6800-Class: U.S. Army Operational Test and Evaluation Comd., ATTN: CSTE-XXX-XXX, Part Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. USAEAC, APG, MD. Report #: 90117051 / SER 11-98. DTIC ADB240746.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

131000 - Marine Engineering

Descriptors:

(U) \*BARGES, DIESEL ENGINES, LOADING(HANDLING), PLATFORMS, CARGO, CRANES, HOISTS, SUPERSTRUCTURES

**System Description:**

1.4.1 The BD (6800 Class) is a non-developmental item. It is outfitted with a diesel-powered, continuously revolving crane that is mounted on the machinery platform of the superstructure and is enclosed by a weatherproof machinery house.

1.4.2 The crane has a luffing boom and main, auxiliary, and whip hoists. The BD barge section is designed to carry a deck load of up to 500 short tons, with a maximum distributed load of 5,000 pounds per square foot (pst) over the reinforced cargo deck area. The BD is intended to operate at air temperatures ranging from -25 to 105 OF, seawater temperature ranging from 28 to 95 OF, and operation in unprotected waters up to Sea State 3 (wave heights of 3.3 feet, wind speed of 14 knots). The BD barge section dimensions are 200 feet long by 80 feet wide by 14 feet 4 inches high. The operator's cab is approximately 70 feet above the barge deck, and the overall height of the crane (excluding the boom) is approximately 97 feet above the light load waterline (90 feet above the deck).

1.4.3 The BD has two decks. Located on the main deck are the capstans/windlasses, storeroom, spreader bars, the deckhouse, Lapeyre stair, intake and exhaust air enclosures, inflatable life raft, communication appliances, mooring bits and chocks, anchor, fittings, and crane. Located below deck are the crew berths, the mess area, the galley, the recreation room, the general stores pantries, the laundry room, the commissary/trash room, the boiler room, the generator room, windlass rooms, the ballast tanks, the bosuns room, the pump rooms, the rigging gear storeroom, the machine shop, the fuel oil tanks, the slop oil tanks, and the equipment room.

1.4.4 The main components of the crane are the machinery house and the operator's cab. The rated loads for the main hoist are provided below. The auxiliary hoist is straight line rated at 56,000 pounds. The whip hoist is straight line rated at 10,000 pounds. The main hoist is variable rated at 257,000 lbs at 60 feet radius from centerline to 113,000 lbs at 175 feet from centerline.

1.4.5 The barge systems include a power generation system (auxiliary, when crane is not online), power distribution system, barge lighting, navigational equipment, internal communication equipment, external communication equipment, and fire detection/alarm/monitoring system. The barge auxiliary systems include heating, ventilating, and air conditioning (HVAC); potable water system; fire fighting system; bilge and ballast system; waste water system; sewage system; compressed air system; and mooring/anchor handling system.

1.4.6 The crane systems include a power generation system (primary, when crane is online), power distribution system, crane lighting, general control devices for operating the crane, external communication, internal communication, fire detection system, fire suppression systems, HVAC, compressed air, and a fixed gas fire protection system/alarms/controls.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

**System Short Name:** SER- Boat- Tug- ST

**Reference** (Stolarz et al., 1999):

Stolarz, B., Player, F., & Shipe, R. (1999). System Evaluation Report (SER) for the 60-Foot Small Tug (St), 900-Class: U.S. Army Operational Test and Evaluation Comd., ATTN: CSTE-XXX-XXX, Part Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. USAEAC, APG, MD. Report #: 90717076 / FEB 01-99. DTIC ADB242143.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

131000 - Marine Engineering

Descriptors:

(U) \*CLASSIFICATION, \*SHIPBUILDING, \*TUGBOATS, TEST AND EVALUATION, MATERIEL, SURVIVABILITY, PERFORMANCE(ENGINEERING), CONSTRUCTION, SAFETY, NAVAL OPERATIONS, SYSTEMS ANALYSIS, SHIPYARDS

**System Description:**

**The ST (900-Class) is a nondevelopmental item.** It is a steel hull vessel that was designed and constructed by the Orange Shipbuilding Company in accordance with American Bureau of Shipping (ABS) standards and the requirements of subchapter C-Uninspected Vessels, Title 46, Code of Federal Regulations (CPR). It is 59 feet 8 inches in overall length, has a beam of 22 feet, has a design draft of 6 feet, and minimum hoisting weight of 109.4 long tons (245,000 pounds). It has twin diesel engines and twin screws and can attain a maximum speed of 9.5 knots. The accommodations and outfitting provide for a five-man crew.

**The ST has two decks and a pilot house.** Located on the main deck are the forward and aft capstans, towing pad, emergency fire pump, two 20-ton winches and the deckhouse. Inside the deckhouse are two 60 kW generator sets, the CO<sub>2</sub> system, the galley, the mess area, a triple-berth crew area, and the head (sewage is processed by a US-Coast-Guard-approved incinerating system that does not require a holding tank). The 01 deck contains the exhaust stack, life raft, paint locker, ammo locker, and deckhouse which contains the heating, ventilating, and air conditioning (HVAC) room and a double-berth crew area. The pilot house contains the Captain's chair, the controls to operate the tug, and a chart table. Located below the main deck are the engine room (two Cummins Model KTA19-M3 diesel engines each rated at 640 brake horsepower at 1800 rpm), emergency steering controls, two fuel oil tanks (1,500 gallons each), lube oil tank (270 gallons), waste oil tank (350 gallons), two potable water tanks (392 gallons each), oily water separator, oily water tank (374 gallons), graywater holding tank (800 gallons), graywater pump, ballast pump, bilge pump, fire pump, engine stores, work bench, foul weather gear locker, storage areas, and ballast tanks.

**The ST will be transported on the decks of commercial ships** such as general cargo, container, and float-on/float-off (FLO/FLO). The tug will be loaded and offloaded from general cargo and container ships with a crane. On FLO/FLO ships, the tug will be able to be floated on or off. The tug's loadout in transport will range from light ship to full load.

**The ST is intended to perform its assigned mission** in climatic design types hot and basic (air temperature ranging from -25 to 120 OF), when not impeded by ice. It will be capable, when fully loaded (without tow), of a minimum of 8 knots sustained speed in Sea State 2 (1.5 to 3 foot waves and wind speed of 7 to 10 knots) and be capable of maintaining steerage and speed of 6 knots when fully loaded.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Body Armor- CBA-Plus

**Reference** (Lee, 2003):

Lee, C.-L. C. (2003). System Evaluation Report (SER) for the Milestone C Decision (Common Table of Allowances (CTA) Authorization and Type Classification-Standard (TC-STD)) of the Concealable Ballistic Armor-Plus (CBA-Plus) / Abbreviated (ASER): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB287809.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

190400 - Armor

Descriptors:

(U) \*ARMOR PLATE, \*VESTS, \*BODY ARMOR, TEST AND EVALUATION, MAINTENANCE, LIFE EXPECTANCY(SERVICE LIFE), TEST METHODS, WEIGHT, DROP TESTS, USER NEEDS, TABLES(DATA), ENVIRONMENTAL TESTS, BALLISTICS, QUESTIONNAIRES, WEAR RESISTANCE, CONCEALMENT, REACTION(PSYCHOLOGY)

Identifiers:

(U) \*BALLISTIC TESTS, \*USER TESTS, \*CONCEALABLE BALLISTIC ARMOR-PLUS, CBA-PLUS, CONCEALABILITY, SUITABILITY, DURABILITY, SRT(SPECIAL REACTION TEAM), TEST RESULTS, BALLISTIC RESISTANCE, TEMPERATURE EFFECTS, SATISFACTION RATINGS, SOFT BODY ARMOR

**System Description:**

CBA-Plus is a soft under-vest that covers the vital areas of the torso and sides. The vest consists of two components: a launderable outer shell carrier and flexible ballistic inserts, which provide ballistic protection from 9mm PMJ 124 grains at 1,400 ft/s to Level III threat (M80 ball). The CBA-Plus (without the plates) will be visually concealable at distances of 5 meters while wearing a man's dress shirt or a woman's blouse with a scoop V-type neckline or while wearing a battle dress uniform (BDU) coat with sleeves.

The required weight range for the soft medium-sized vest is between 5.5 and 6.5 pounds and the plates will weigh 4.05 pounds for the back and 2.65 pounds for the front.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Body Armor- Interceptor Body Armor- IBA

**Reference** (Winslow et al., 1999):

Winslow, G. P., Riddick, R., & Finkel, M. (1999). System Assessment (SA) for the Interceptor Body Armor (IBA): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report # 92988145.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

From DTIC ADB245136:

Fields and Groups:

190400 - Armor

Descriptors:

(U) \*DAMAGE ASSESSMENT, \*TERMINAL BALLISTICS, \*BODY ARMOR, TEST AND EVALUATION, SURVIVABILITY, FIRING TESTS(ORDNANCE), OPERATIONAL EFFECTIVENESS, HUMAN FACTORS ENGINEERING

**System Description:**

From DTIC ADB245136:

The IBA system is a modular vest that is designed to improve the survivability of the dismounted combatant against increasingly lethal munitions, small arms, and rifle fire; to minimize the burden of weight and heat stress; and to improve the compatibility of ballistic protection with the combatant's individual equipment. The Interceptor must function with load-bearing equipment so that the two systems can be donned and doffed independently. The OTV, made of Cordura™ nylon fabric, is the basic vest of which three SBI made of 600 denier/28 ply KM2 Kevlar, are an integral component. Although the SBI can be removed, they are intended to be used with the OTV at all times: the design for removal is for the purpose of upgrading to a new material if a more ballistically resistant or lighter material is proven. The SBI are intended to provide fragmentation protection that is at least equal to the protection provided by the currently fielded PASGT vest without an increase in weight or a decrease in area coverage. The combatant can upgrade the small arms and rifle bullet resistance of the IBA by inserting two rigid SAPI, made of boron carbide ceramic, into dedicated pockets on the overlapping right front and on the back of the vest. The OTV is secured to the combatant with adjustable side closure straps and in the front with a combination of hook and loop fasteners and three snap buttons on the interlocking double-breasted flap. The system also includes a soft collar, throat protector, and groin protector, each of which is detachable. The Interceptor can be fully disassembled for cleaning, inspection, and maintenance or for the replacement of the SBI and SAPI armor. Removal of the armor is facilitated by the use of hook and loop fasteners. The front of the OTV incorporates multiple nylon webbing loops that allow for the mounting of mission-oriented equipment.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Body Armor- Interceptor Body Armor- IBA

**Reference** (Winslow et al., 1999):

Winslow, G. P., Riddick, R., Finkel, M., & Greene, T. (1999). System Evaluation Report (SER) for the Interceptor Body Armor (IBA): U.S. Army Evaluation Center (AEC), Aberdeen Proving Ground, MD. Report #: 92158101. DTIC ADB245136.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190400 - Armor

Descriptors:

(U) \*DAMAGE ASSESSMENT, \*TERMINAL BALLISTICS, \*BODY ARMOR, TEST AND EVALUATION, SURVIVABILITY, FIRING TESTS(ORDNANCE), OPERATIONAL EFFECTIVENESS, HUMAN FACTORS ENGINEERING

**System Description:**

The IBA system is a modular vest that is designed to improve the survivability of the dismounted combatant against increasingly lethal munitions, small arms, and rifle fire; to minimize the burden of weight and heat stress; and to improve the compatibility of ballistic protection with the combatant's individual equipment. The Interceptor must function with load-bearing equipment so that the two systems can be donned and doffed independently. The OTV, made of Cordura™ nylon fabric, is the basic vest of which three SBI made of 600 denier/28 ply KM2 Kevlar, are an integral component. Although the SBI can be removed, they are intended to be used with the OTV at all times: the design for removal is for the purpose of upgrading to a new material if a more ballistically resistant or lighter material is proven. The SBI are intended to provide fragmentation protection that is at least equal to the protection provided by the currently fielded PASGT vest without an increase in weight or a decrease in area coverage. The combatant can upgrade the small arms and rifle bullet resistance of the IBA by inserting two rigid SAPI, made of boron carbide ceramic, into dedicated pockets on the overlapping right front and on the back of the vest. The OTV is secured to the combatant with adjustable side closure straps and in the front with a

combination of hook and loop fasteners and three snap buttons on the interlocking double-breasted flap. The system also includes a soft collar, throat protector, and groin protector, each of which is detachable. The Interceptor can be fully disassembled for cleaning, inspection, and maintenance or for the replacement of the SBI and SAPI armor. Removal of the armor is facilitated by the use of hook and loop fasteners. The front of the OTV incorporates multiple nylon webbing loops that allow for the mounting of mission-oriented equipment.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- BVTC

**Reference** (Smith et al., 2002):

Smith, J., Alvarez, M., Jones, M., Bruder, B., Robinson, J., Manasco, C., Jones, H., III, Doyle, K., & Wieworka, T. (2002). System Evaluation Report (SER) for the Battlefield Video Teleconference (BVTC) System: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 21568665. DTIC ADB279671.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

150100 - Military Forces and Organizations

250200 - Radio Communications

Descriptors:

(U) \*BRIGADE LEVEL ORGANIZATIONS, \*COMMUNICATIONS NETWORKS, \*VIDEO SIGNALS, \*CONFERENCING(COMMUNICATIONS), TEST AND EVALUATION, RISK, DECISION MAKING, PRODUCTION, SURVIVABILITY, BATTLEFIELDS, SPECIFICATIONS, PERFORMANCE(ENGINEERING), TEAMS(PERSONNEL), SYSTEMS ANALYSIS

Identifiers:

(U) BVTC(BATTLEFIELD VIDEO TELECONFERENCE)

**System Description:**

The BVTC is a tactical communications system that provides video, data, and voice for support of the U.S. Army's BCT, the First Digitized Division, and First Digitized Corps. It allows tactical commanders to disseminate orders, clearly convey their intent, and collaboratively plan and war game courses of action with subordinate commanders and key staff elements. The BVTC provides the commander with access to accurate, timely, and situational information. The BVTC also assists the commander in coordinating and interacting with different echelons and adjacent units. The BVTC consists of two main subsets of equipment: the BVTC user terminal or end station and the BVTC network service elements or BITS. The BVTC user terminal consists of the following major components: portable computer with audio and video peripheral devices, H.323 gatekeeper/proxy, and H.323 compression/decompression (CODEC) modem. They are transported in two transit cases. The BVTC network service elements consist of the following major components: H.323 multipoint conferencing unit (MCV) and H.323 gateway gatekeeper/proxy.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- CABS

**Reference** (Unruh et al., 2001):

Unruh, K., Kennedy, J., Vogt, J., Minjares, J., & Justice, J. (2001). System Evaluation Report (SER) for the Cockpit Air Bag Systems (CABS): U.S. Army Evaluation Center (AEC), Aberdeen Proving Ground, MD. Report #: 11878526. DTIC ADB267848.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

010301 - Helicopters

230400 - Protective Equipment

Descriptors:

(U) \*COCKPITS, \*HELICOPTERS, \*AIR BAG RESTRAINT SYSTEMS, TEST AND EVALUATION, MILITARY REQUIREMENTS, SURVIVABILITY, FLIGHT CREWS, MISSION PROFILES, VULNERABILITY, OPERATIONAL EFFECTIVENESS, ELECTROMAGNETIC RADIATION, AVIATION ACCIDENTS, TEST FACILITIES, ARMY AIRCRAFT, AVIATION MEDICINE

Identifiers:

(U) \*AIRBAGS, CABS(COCKPIT AIR BAG SYSTEM), UH-60 AIRCRAFT, OH-58 AIRCRAFT, EMV(ELECTROMAGNETIC VULNERABILITY), CRASH STRIKE ENVELOPE

**System Description:**

The CABS is a crash-activated, inflatable protection system intended to supplement the current webbing restraint systems on helicopters. It consists of a B kit and an aircraft-specific modification work order (MWO) A-kit. The B-kit consists of forward and lateral air bag modules for each crew station and a programmable electronic crash sensor unit (ECSU). Each air bag module will consist of a protective container, an air bag, and a gas generator for inflation of the air bag system. The programmable ECSU will be common to all aircraft applications. The specific aircraft installation MWO A-kit will consist of aircraft wiring, a circuit breaker, mounting hardware, MWO installation instructions, and structural installation provisions for the air bag modules and ECSU components. In a crash scenario, the air bags will inflate forward and lateral to the crew, keeping the aviator away from impact hazards. In the uninflated mode of operation, the CABS is nonobtrusive to the aircrew and, in the event of a crash impact, will automatically function in the following manner:

- a. The ECSU discriminates the deceleration signature associated with the impact by comparing its severity with a preset design threshold.
- b. Should the threshold level be exceeded, circuitry will send an actuation current to each gas generator.
- c. In response to the activation of the gas generators, the forward and lateral air bags will deploy from the air bag modules.
- d. The occupant's dynamic response to the crash forces is then attenuated by the deployed air bags. The CABS is a crash activated inflatable protection system intended to supplement the current webbing restraint systems on helicopters.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- CALSET 2000

**Reference** (Smith et al., 2001):

Smith, F. B., Jr., Tubell, W., Matthews, S., Cook, J., & Wright, G. (2001). System Assessment (SA) for the Calibration Set 2000 (CALSET 2000): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 11778510.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

**System Description:**

The CALSET 2000 is a follow-on procurement to the present calibration set Secondary Transfer Standards AN/GSM-286 and AN/GSM-287. The main thrust of CALSET 2000 is provide the capability to insert emerging technology into the force structure in order to meet new requirements for rapid deployment, reconfigurability, and improved performance for operation on the Digitized battlefield. The CALSET 2000 will be replacing only the military Table of Organization & Equipment portion of the present CALSETS; however, it is anticipated that CALSET 2000 instrumentation will be phased into the Table of Distribution and Allowances version of the present CALSETS via attrition. A Program Definition and Risk Reduction (PDRR) phase was established in March 1999. This phase of testing focused on development of a prototype system, customer familiarity/field exercises, and Customer User test. Since CALSET 2000 is essentially a repackaging effort employing mostly commercial-off-the-shelf (COTS) and non-development items (NUI), many of which are presently components of the existing CALSET, a Milestone C is anticipated.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Cannon- 25mm- Cartridge- APFSDS-T M919

**Reference** (Jenkins et al., 2000):

Jenkins, H., Fillinger, L., Myers, J., Abeyta, R., Heatwole, C., & Robinson, J. (2000). System Assessment (SA) for the 25mm, Armor-Piercing Fin Stabilized Discarding Sabot-Tracer (APFSDS-T), M919 Cartridge with Swiss Munitions Extruded/Impregnated (EI)-Propellant U.S. Army Test and Evaluation Command, Park Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB253525.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

190100 - Ammunition and Explosives

190101 - Pyrotechnics

Descriptors:

(U) \*ARMOR PIERCING AMMUNITION, \*FIN STABILIZED AMMUNITION, \*SABOT PROJECTILES, \*CARTRIDGES, \*TRACER AMMUNITION, TEST AND EVALUATION, PROPELLANTS, SYSTEMS ANALYSIS

Identifiers:

(U) M919 CARTRIDGE, APFSDS-T(ARMOR-PIERCING FIN STABILIZED DISCARDING SABOT TRACER)

**System Description:**

The M919 Cartridge employs a fin-stabilized, high length-to diameter ratio, depleted uranium (DU) penetrator. The M919 uses a modified 25mm cartridge case as well as ignition system and a high-energy propellant charge to achieve its desired launch velocities. The penetrator assembly consists of steel injection-molded traced fin, an aluminum zinc coated DU penetrator, and an aluminum windscreen. Discarding components include an aluminum three-piece sabot, nylon obturator, and plastic protective cap. Since September 1996, Engineering Change Proposals (ECPs) have been issued to address the M919's shortcomings. The significant changes to the cartridge follow.

a. Increased the hub diameter of the fin and root chord diameter of the penetrator to increase the robustness of the core/fin joint.

b. To improve the robustness of the projectile, a thin JRTV boot was installed over the rear of the sabot assembly to prevent any gas wash/leaking between the sabot pedals if the round was fired in a mildly worn tube.

- c. To improve tracer visibility, the inner diameter of the tracer cavity was increased to allow for more tracer material.
- d. The booster in the cartridge's ignition system was changed from a single pellet and a plastic locator placed in the flash tube to granular black powder.
- e. The Hercules/Radford HES9553 blended propellant was changed to the EI Nitrochemie (SWISS) propellant, to lower the flame temperature, improve the consistency of the round's interior ballistics, lower the cost of the round, and improved tracer visibility.
- f. The geometry of the fin blade tips was changed from a straight to a bent and/or canted blade to induce higher down-range steady-state spin rates. This change is intended to aid in improving tracer visibility.
- g. The grease-paste erosion inhibitor that was placed in the interior walls of the cartridge case to reduce muzzle obscuration and the over-all firing signature from the weapon was eliminated.
- h. The new M919 cores are being manufactured from cycling demiled M833 (demiled 105mm tank round) DU cores.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Cannon- 25mm- Cartridge- APFSDS-T M919 (rev)

**Reference** (Jenkins et al., 2000):

Jenkins, H., Fillinger, L., Myers, J., Abeyta, R., Heatwole, C., & Robinson, J. (2000). System Assessment (SA) for the 25mm, Armor-Piercing Fin Stabilized Discarding Sabot-Tracer (APFSDS-T), M919 Cartridge with Swiss Munitions Extruded/Impregnated (EI)-Propellant (Revised): U.S. Army Test and Evaluation Command, Park Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB256830.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*ARMOR PIERCING AMMUNITION, \*SABOT PROJECTILES, DECISION MAKING, WEAPON SYSTEMS, AMMUNITION, RELEASE, SYSTEMS ANALYSIS, FIN STABILIZED AMMUNITION, SWITZERLAND, PROJECT MANAGEMENT

Identifiers:

(U) 25-MM AMMUNITION, M-919 CARTRIDGES, APFSDS-T(ARMORED PIERCING FIN STABILIZED DISCARDING SABOT TRACER)

**System Description:**

The M919 Cartridge employs a fin-stabilized, high length-to diameter ratio, depleted uranium (DU) penetrator. The M919 uses a modified 25mm cartridge case as well as ignition system and a high-energy propellant charge to achieve its desired launch velocities. The penetrator assembly consists of steel injection-molded traced fin, an aluminumzinc- coated DU penetrator, and an aluminum windscreen. Discarding components include an aluminum three-piece sabot, nylon obturator, and plastic protective cap. Since September 1996, ECPs have been issued to address the M919's shortcomings. The significant changes to the cartridge follow.

- a. Increased the hub diameter of the fin and root chord diameter of the penetrator to increase the robustness of the core/fin joint.
- b. To improve the robustness of the projectile, a thin JRTV boot was installed over the rear of the sabot assembly to prevent any gas wash/leaking between the sabot pedals if the round was fired in a mildly worn tube.
- c. To improve tracer visibility, the inner diameter of the tracer cavity was increased to allow for more tracer material.

- d. The booster in the cartridge's ignition system was changed from a single pellet and a plastic locator placed in the flash tube to granular black powder.
- e. The Hercules/Radford HES9553 blended propellant was changed to the EI Nitrochemie (SWISS) propellant, to lower the flame temperature, improve the consistency of the round's interior ballistics, lower the cost of the round, and improve tracer visibility.
- f. The geometry of the fin blade tips was changed from a straight to a bent and/or canted blade to induce higher down-range steady-state spin rates. This change is intended to aid in improving tracer visibility.
- g. The grease-paste erosion inhibitor that was placed in the interior walls of the cartridge case to reduce barrel erosion was eliminated.
- h. The new M919 cores are being manufactured from cycling demiled M833 (demiled 105mm tank round) DU cores.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Cannon- 105mm- Cartridge- APC Canister M1040

**Reference** (Smyers and Blankenship, 2006):

Smyers, P., & Blankenship, C. (2006). System Evaluation Report (SER) for the Type Classification-Standard and Full-Rate Production Decisions for the Cartridge, 105mm Canister, Anti-Personnel, M1040: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 62289168. DTIC ADB320197.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*ANTIPERSONNEL AMMUNITION, \*CARTRIDGES, \*CANISTER PROJECTILES, TEST AND EVALUATION, DECISION MAKING, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, MACHINE GUNS

Identifiers:

(U) \*M1040 CARTRIDGES, \*MGS(MOBILE GUN SYSTEM)

**System Description:**

The M1040 cartridge consists of a propulsion/ignition system and an inert projectile. The propulsion/ignition system consists of a steel cartridge case, M125 electric primer, and 11.61 pounds of M14 propellant. The inert projectile is made of an aluminum base, nylon obturator and body, and a scored aluminum can. Together the nylon body and aluminum can contain 2080 0.31-inch diameter tungsten spheres that are expelled upon muzzle exit. There is no tracer or fuze. The cartridge simultaneously produces two dispersion patterns--One optimized for shorter-range targets (out to approximately 150 meters) and one optimized for longer ranges (150-300 meters). The dispersion of the submunitions increases with range as their velocity decreases. The M1040 will be fired from the MGS (M68A1E4) cannon. The M1040 must be fully compatible with the MGS to permit automated, responsive handling, loading, and firing of the munition. The M1040 will be stored and shipped in a PA117 metal container (also used for the M393A3 cartridge). The packaging used inside the PA117 has been modified to provide additional support to the M1040 projectile. The M1040 is an acquisition category III program.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to

Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458:

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**System Short Name:** SER- Cannon- 105mm- Cartridge- APC Canister M1040

**Reference** (Smyers and Blankenship, 2007):

Smyers, P., & Blankenship, C. (2007). System Assessment (SA) for the Produced in Support of a Full Materiel Release Decision for the Cartridge, 105mm, Canister, M1040: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB324975.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*CANISTERS, \*CARTRIDGES, TEST AND EVALUATION, INFANTRY, PROJECTILES, GUNS

Identifiers:

(U) \*M1040 CANISTERS, MGS(MOBILE GUN SYSTEM)

**System Description:**

The M1040 cartridge consists of a propulsion/ignition system and an inert projectile. The propulsion/ignition system consists of a steel cartridge case, M125 electric primer, and 11.61 pounds of M14 propellant. The inert projectile is made of an aluminum base, nylon obturator and body, and a scored aluminum can. Together the nylon body and aluminum can contain approximately 2,075 0.31-inch diameter tungsten spheres that are expelled upon muzzle exit. Tracers or fuzes are not used. The cartridge simultaneously produces two dispersion patterns--one optimized for shorter-range targets (out to approximately 150 meters) and one for longer ranges (150 to 300 meters). The dispersion of the submunitions increases with range as their velocity decreases. The M1040 will be fired from the MGS (M68A1E4) cannon. The cartridge must be fully compatible with the MGS to permit automated, responsive handling, loading, and firing of the munition. The M1040 will be stored and shipped in a PA117 metal container (also used for the M393A3 cartridge). The packaging used inside the PA117 has been modified to provide additional support to the M1040 projectile. The M1040 is an acquisition category III program.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Cannon- 105mm- Cartridge- APC Canister XM1040

**Reference** (Baldauf and Smyers, 2005):

Baldauf, A., & Smyers, P. (2005). System Evaluation Report (SER) for the Milestone C Decision for the XM1040 105mm Anti-Personnel Canister Cartridge: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 51367994. DTIC ADB307568.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*ANTIPERSONNEL AMMUNITION, TEST AND EVALUATION, DECISION MAKING, SURVIVABILITY, CLASSIFICATION, SYSTEMS ANALYSIS, LIFE CYCLES, LOW RATE

Identifiers:

(U) M-1040 AMMUNITION, 105-MM AMMUNITION

**System Description:**

XM1040 cartridge consists of a propulsion/ignition system and an inert projectile. The propulsion/ignition system is comprised of a steel cartridge case, M125 electric primer, and 11.8 pounds of M14 propellant. The inert projectile is made of an aluminum base, nylon obturator and body, and a scored aluminum can containing 2080 0.31-inch diameter tungsten spheres that are expelled on muzzle exit. No tracer or fuze exists. The cartridge simultaneously produces two dispersion patterns--one optimized for shorter-range targets (out to approximately 150 meters), and one optimized for longer ranges (150-300 meters). The dispersion of the submunitions increases with range as their velocity decreases. The XM1040 will be fired from the MGS (M68A1E4) cannon. The XM1040 must be fully compatible with the MGS to permit automated, responsive handling, loading, and firing of the munition. The XM1040 will be stored and shipped in a PAI 17 metal container (also used for the M393E3 cartridge). The packaging used inside the PAI 17 will be modified to provide additional support to the XM1040 projectile. The XM1040 is an acquisition category III program.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Cannon- 105mm- Cartridge- HE M393A3

**Reference** (Smyers et al., 2005):

Smyers, P., Zirhut, M., Jessop, S., Wetzel, R., Pressman, A., & Sokolis, B. (2005). System Assessment (SA) for the Produced in Support of a Materiel Release Decision for the M393A3 105mm High Explosive Cartridge and the M467a1 105mm Target Practice Cartridge: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB311567.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*TARGETS, \*CARTRIDGES, \*HIGH EXPLOSIVE AMMUNITION, TEST AND EVALUATION, OPERATIONAL EFFECTIVENESS, LIFE CYCLE TESTING, PERFORMANCE(ENGINEERING)

Identifiers:

(U) \*SYSTEM ASSESSMENT, \*M393A3 CARTRIDGE, \*M467A1 CARTRIDGE

**System Description:**

The M393A3 cartridge consists of a propulsion/ignition system and a high explosive (HE) projectile. The propulsion/ignition system consists of a metal cartridge case, electric primer, and propellant. The projectile is a steel shell filled with 6.4 pounds of Composition A3 explosive with a tracer and an impact fuze. The M467A1 cartridge is similar to the M393A3, but does not include a fuze or explosive filler in the projectile. The M393A3/M467A1 effort is an acquisition category III program.

The M1128 Stryker Mobile Gun System (MGS) crews will employ the M393A3 cartridge in support of assaulting infantry, including breaching walls and defeating hardened enemy bunkers. The M467A1 cartridge will be used to simulate the firing of the M393A3 during training. The M393A3 and M467A1 are nondevelopmental items. The M393A3 will replace/augment the aging M393A2 stockpile (now about 29 years old), and the M467A1 will replenish the existing M467 stockpile.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or

potentially significant military application. Other requests for this document must be referred to  
Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458:

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**System Short Name:** SER- Cannon- Cartridge- 120mm- APFSDS-T M829A3

**Reference** (ATEC, 2005):

ATEC. (2005). System Assessment (SA) for the on the Cartridge, 120mm, Armor Piercing, Fin Stabilized, Discarding Sabot, with Tracer (APFSDS-T), M829A3: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report # 52158026.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)  
From DTIC ADC070593:

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*ARMOR PIERCING AMMUNITION, \*FIN STABILIZED AMMUNITION, \*TRACER AMMUNITION,  
TEST AND EVALUATION, DECISION MAKING, HAZARDS, SURVIVABILITY, RELIABILITY, KINETIC  
ENERGY, CLIMATE, SYSTEMS ANALYSIS, STIMULI, INSENSITIVE EXPLOSIVES, SABOT  
PROJECTILES, WAIVER, CARTRIDGES

**System Description:**

From ARL-HRED MANPRINT Assessment (Spine, 2002):

The M829E3 cartridge is a 120mm armor-piercing, fin stabilized, discarding sabot, launched projectile currently entering Product Qualification Testing (PQT) and is scheduled to replace the current service cartridge, M829A2. The M829E3 cartridge is intended for use in the M256 smooth bore gun and is designed to improved accuracy and armor penetration against existing and future threats.

The M829E3 cartridge is a kinetic energy cartridge utilizing a combination of high technology and existing 120mm components. The projectile features a sabot fabricated from composite material (same as M829A2) to reduce the parasitic weight of the projectile. The penetrator, which is dimensionally different from the M829A2 but the same material, is depleted uranium and manufactured the same as the M829A2.

The M829E3 ignition system consists of the M123Al electric primer, currently used on the M830 HEAT cartridge, and a 24 gram black powder base charge. The RPD-380 propellant consists of approximately 18 lb. of 19 perforated stick and 46 perforated hexagonal stick, which is similar in formulation to JA2. JA2 multi-perforated stick is currently used on the M829A2. Its formulation is located in section 4.2.2. The propulsion configuration is similar to the M829A2. The propellant is contained within the nylon obturator, consumable case adapter, combustible cartridge case and the steel case base and seal assembly. All components, except the propellant and an improved spring disc, are currently used on 120mm-tank ammunition.

The subprojectile consists of a penetrator assembly and aluminum fin with tracer. The tracer is currently used on the M86S training cartridge. The penetrator assembly consists of the depleted uranium penetrator and windshield. The subprojectile with annular grooves mates with a three-piece composite sabot having a molded JRTV seal, a nylon obturator band, and a rear retaining ring.

**Report Availability:**

Secret/NoForN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Cannon- Cartridge- 120mm- APFSDS-T M829E3

**Reference** (ATEC, 2002):

ATEC. (2002). System Assessment (SA) for the Live Fire Lethality Test for Cartridge: 120mm APFSDS-T, M829E3 (U): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. CSTE-AEC-SVE-B, Aberdeen, MD. Report # 23388755.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)  
From DTIC ADC070593:

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*ARMOR PIERCING AMMUNITION, \*FIN STABILIZED AMMUNITION, \*TRACER AMMUNITION, TEST AND EVALUATION, DECISION MAKING, HAZARDS, SURVIVABILITY, RELIABILITY, KINETIC ENERGY, CLIMATE, SYSTEMS ANALYSIS, STIMULI, INSENSITIVE EXPLOSIVES, SABOT PROJECTILES, WAIVER, CARTRIDGES

**System Description:**

From ARL-HRED MANPRINT Assessment (Spine, 2002):

The M829E3 cartridge is a 120mm armor-piercing, fin stabilized, discarding sabot, launched projectile currently entering Product Qualification Testing (PQT) and is scheduled to replace the current service cartridge, M829A2. The M829E3 cartridge is intended for use in the M256 smooth bore gun and is designed to improved accuracy and armor penetration against existing and future threats.

The M829E3 cartridge is a kinetic energy cartridge utilizing a combination of high technology and existing 120mm components. The projectile features a sabot fabricated from composite material (same as M829A2) to reduce the parasitic weight of the projectile. The penetrator, which is dimensionally different from the M829A2 but the same material, is depleted uranium and manufactured the same as the M829A2.

The M829E3 ignition system consists of the M123AI electric primer, currently used on the M830 HEAT cartridge, and a 24 gram black powder base charge. The RPD-380 propellant consists of approximately 18 lb. of 19 perforated stick and 46 perforated hexagonal stick, which is similar in formulation to JA2. JA2 multi-perforated stick is currently used on the M829A2. Its formulation is located in section 4.2.2. The propulsion configuration is similar to the M829A2. The propellant is contained within the nylon obturator, consumable case adapter, combustible cartridge case and the steel case base and seal assembly. All components, except the propellant and an improved spring disc, are currently used on 120mm-tank ammunition.

The subprojectile consists of a penetrator assembly and aluminum fin with tracer. The tracer is currently used on the M86S training cartridge. The penetrator assembly consists of the depleted uranium penetrator and windshield. The subprojectile with annular grooves mates with a three-piece composite sabot having a molded JRTV seal, a nylon obturator band, and a rear retaining ring.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Cannon- Cartridge- 120mm- APFSDS-T M829E3

**Reference (ATEC, 2003):**

ATEC. (2003). System Assessment (SA) for the Cartridge, 120mm Armored Piercing, Fin Stabilized, Discarding Sabot, with Tracer (APFSDS-T), M829E3 (U): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. AEC, APG, MD. Report #: 30108768. Report Classification: SECRET/NOFORN. Citation Unclassified.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)  
From DTIC ADC070593:

**Fields and Groups:**

190100 - Ammunition and Explosives

**Descriptors:**

(U) \*ARMOR PIERCING AMMUNITION, \*FIN STABILIZED AMMUNITION, \*TRACER AMMUNITION, TEST AND EVALUATION, DECISION MAKING, HAZARDS, SURVIVABILITY, RELIABILITY, KINETIC ENERGY, CLIMATE, SYSTEMS ANALYSIS, STIMULI, INSENSITIVE EXPLOSIVES, SABOT PROJECTILES, WAIVER, CARTRIDGES

**System Description:**

From ARL-HRED MANPRINT Assessment (Spine, 2002):

The M829E3 cartridge is a 120mm armor-piercing, fin stabilized, discarding sabot, launched projectile currently entering Product Qualification Testing (PQT) and is scheduled to replace the current service cartridge, M829A2. The M829E3 cartridge is intended for use in the M256 smooth bore gun and is designed to improved accuracy and armor penetration against existing and future threats.

The M829E3 cartridge is a kinetic energy cartridge utilizing a combination of high technology and existing 120mm components. The projectile features a sabot fabricated from composite material (same as M829A2) to reduce the parasitic weight of the projectile. The penetrator, which is dimensionally different from the M829A2 but the same material, is depleted uranium and manufactured the same as the M829A2.

The M829E3 ignition system consists of the M123Al electric primer, currently used on the M830 HEAT cartridge, and a 24 gram black powder base charge. The RPD-380 propellant consists of approximately 18 lb. of 19 perforated stick and 46 perforated hexagonal stick, which is similar in formulation to JA2. JA2 multi-perforated stick is currently used on the M829A2. Its formulation is located in section 4.2.2. The propulsion configuration is similar to the M829A2. The propellant is contained within the nylon obturator, consumable case adapter, combustible cartridge case and the steel case base and seal assembly. All components, except the propellant and an improved spring disc, are currently used on 120mm-tank ammunition.

The subprojectile consists of a penetrator assembly and aluminum fin with tracer. The tracer is currently used on the M86S training cartridge. The penetrator assembly consists of the depleted uranium penetrator and windshield. The subprojectile with annular grooves mates with a three-piece composite sabot having a molded JRTV seal, a nylon obturator band, and a rear retaining ring.

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Cannon- Cartridge- 120mm- APFSDS-T M829E3

**Reference** (Baldauf et al., 2003):

Baldauf, A., Heatwole, C., Koffinke, D., Reich, P., & Harrington, N. (2003). System Evaluation Report (SER) for the Cartridge, 120mm, Armor Piercing, Fin Stabilized, Discarding Sabot, with Tracer (APFSDS-T), M829E3, Full-Rate Production - Type Classification Standard U.S. Army Evaluation Center (AEC), Aberdeen Proving Ground, MD. Report #: 33008879. DTIC ADC070593. Report Classification: SECRET. Citation Classification: Unclassified.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

**Fields and Groups:**

190100 - Ammunition and Explosives

**Descriptors:**

(U) \*ARMOR PIERCING AMMUNITION, \*FIN STABILIZED AMMUNITION, \*TRACER AMMUNITION, TEST AND EVALUATION, DECISION MAKING, HAZARDS, SURVIVABILITY, RELIABILITY, KINETIC ENERGY, CLIMATE, SYSTEMS ANALYSIS, STIMULI, INSENSITIVE EXPLOSIVES, SABOT PROJECTILES, WAIVER, CARTRIDGES

**System Description:**

From ARL-HRED MANPRINT Assessment (Spine, 2002):

The M829E3 cartridge is a 120mm armor-piercing, fin stabilized, discarding sabot, launched projectile currently entering Product Qualification Testing (PQT) and is scheduled to replace the current service cartridge, M829A2. The M829E3 cartridge is intended for use in the M256 smooth bore gun and is designed to improved accuracy and armor penetration against existing and future threats.

The M829E3 cartridge is a kinetic energy cartridge utilizing a combination of high technology and existing 120mm components. The projectile features a sabot fabricated from composite material (same as M829A2) to reduce the parasitic weight of the projectile. The penetrator, which is dimensionally different from the M829A2 but the same material, is depleted uranium and manufactured the same as the M829A2.

The M829E3 ignition system consists of the M123Al electric primer, currently used on the M830 HEAT cartridge, and a 24 gram black powder base charge. The RPD-380 propellant consists of approximately 18 lb. of 19 perforated stick and 46 perforated hexagonal stick, which is similar in formulation to JA2. JA2 multi-perforated stick is currently used on the M829A2. Its formulation is located in section 4.2.2. The propulsion configuration is similar to the M829A2. The propellant is contained within the nylon obturator, consumable case adapter, combustible cartridge case and the steel case base and seal assembly. All components, except the propellant and an improved spring disc, are currently used on 120mm-tank ammunition.

The subprojectile consists of a penetrator assembly and aluminum fin with tracer. The tracer is currently used on the M86S training cartridge. The penetrator assembly consists of the depleted uranium penetrator and windshield. The subprojectile with annular grooves mates with a three-piece composite sabot having a molded JRTV seal, a nylon obturator band, and a rear retaining ring.

**Report Availability:**

Secret/NoForN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Cannon- Cartridge- 120mm- Canister M1028

**Reference** (Smyers et al., 2005):

Smyers, P., Zirhut, M., Jessop, S., Wetzel, R., Durkin, P., Hubbard, C., & Sokolis, B. (2005). System Evaluation Report (SER) for the Full-Rate Production/Type Classification - Standard Decision for the M1028 120mm Canister Cartridge: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 52278031. DTIC ADB311047.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

131300 - Structural Engineering and Building Technology

190300 - Combat Vehicles

Descriptors:

(U) \*GROUND VEHICLES, \*COMBAT VEHICLES, MILITARY VEHICLES, SYSTEMS ANALYSIS

**System Description:**

The M1028 cartridge consists of a propulsion / ignition system and an inert projectile. The propulsion/ignition system is comprised of a combustible cartridge case with metal base, modified M125 electric primer, and JA-2 propellant. The projectile is a two-piece aluminum canister containing 1,098 small tungsten balls that are expelled on the muzzle exit, with no tracer or fuze. Submunition dispersion increases and velocity decreases with range. The M1028 is an acquisition category III program responding to an urgent need in the Korean theater.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Cannon- Cartridge- 120mm- Canister M1028

**Reference** (Smyers et al., 2006):

Smyers, P., Blankenship, C., Durkin, P., & Hubbard, C. (2006). System Assessment (SA) for the Produced in Support of a Full Materiel Release Decision for the Cartridge, 120mm: Canister, M1028: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB321245.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*CARTRIDGES, \*CANISTER PROJECTILES, EXPERIMENTAL DATA, DECISION MAKING, PROJECTILES, RATES, OPERATIONAL EFFECTIVENESS, CLASSIFICATION, RELEASE, STANDARDIZATION, SYSTEMS ANALYSIS, LOW RATE

Identifiers:

(U) 120-MM CARTRIDGES, M-1028 CARTRIDGES

**System Description:**

The M1028 cartridge consists of a propulsion/ignition system and an inert projectile. The propulsion/ignition system is comprised of a combustible cartridge case with metal base, modified M125 electric primer, and JA2 propellant. The projectile is a two-piece aluminum canister containing 1,098 small tungsten balls that are expelled at muzzle exit, with no tracer or fuze. The M1028 is insensitive munition-compliant. Submunition dispersion increases and velocity decreases with range. The M1028 is an Acquisition Category III program which was initiated in response to an urgent need in the Korean theater. Since program initiation, the U.S. Army, Europe (USAEUR), 1st Cavalry Division, 4th Infantry Division, and Coalition Forces Land Component Command (CFLCC) have also submitted Operational Needs Statements (ONSS) indicating their requirements for a 120mm canister cartridge.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Cannon- Cartridge- 120mm- Canister XM1028

**Reference** (Baldauf, 2005):

Baldauf, A. (2005). System Evaluation Report (SER) for the XM1028 120mm Canister Cartridge for the Milestone C and Type Classification - Low-Rate Production Decisions / Abbreviated (ASER): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB307094.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

190100 - Ammunition and Explosives

**Descriptors:**

(U) \*TEST AND EVALUATION, \*DECISION MAKING, \*PRODUCTION, \*LOW RATE, \*CARTRIDGES, \*CANISTER PROJECTILES, INFANTRY, PROPELLANTS, KOREA, SUBMUNITIONS, TANKS(COMBAT VEHICLES), IGNITION SYSTEMS, URBAN WARFARE

**Identifiers:**

(U) ASER(ABBREVIATED SYSTEM EVALUATION REPORT), LRP(LOW-RATE PRODUCTION)

**System Description:**

The XM1028 120mm Canister Cartridge will be fired from the M256 smoothbore cannon of M1A1- and M1A2-series Abrams Main Battle Tanks against assaulting infantry. It will also be used to provide covering fire in support of friendly infantry assaults. Depending on the results of testing, the XM1028 may be employed against a variety of urban targets such as houses, timber bunkers, and concrete block walls. The cartridge consists of a propulsion/ignition system and an inert projectile. The propulsion/ignition system is comprised of a combustible cartridge case with metal base, electric primer, and propellant. The projectile is a two-piece aluminum canister containing 1097 small tungsten balls that are expelled upon muzzle exit. There is no tracer or fuze. The dispersion of the submunitions increases with range as their velocity decreases.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Cannon- Cartridge- 120mm- HE-OR-T

**Reference (AEC, 2002):**

AEC. (2002). System Evaluation Report (SER) for the Type Classification and Materiel Release of the Cartridge 120mm High Explosive-Obstacle Reduction (HE-or-T) XM908 / Abbreviated (ASER): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. DTIC ADC069828.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

190100 - Ammunition and Explosives

**Descriptors:**

(U) \*TRACER AMMUNITION, \*HIGH EXPLOSIVE AMMUNITION, TEST AND EVALUATION, ACCEPTANCE TESTS, DECISION MAKING, CONCRETE, TARGETS, STEEL, ARMY EQUIPMENT, SYSTEMS ANALYSIS, NOSES

**System Description:**

Cartridge 120mm High Explosive-Obstacle Reduction With Tracer (HE-OR-T), XM908.

**Report Availability:**

Confidential/NoFORN- Report Classification: Confidential. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Cannon- Cartridge- 120mm- TPMP-T M1002

**Reference (Smyers and Blankenship, 2006):**

Smyers, P., & Blankenship, C. (2006). System Evaluation Report (SER) for the Cartridge, 120mm, Target Practice Multi-Purpose with Tracer (TPMP-T), M1002. System Evaluation Report Produced in Support of Type Classification - Standard and Full Rate Production Decisions U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 62069159. DTIC ADB318328.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*HIGH EXPLOSIVE AMMUNITION, SURVIVABILITY, FIRING TESTS(ORDNANCE), OPERATIONAL EFFECTIVENESS, TRACER AMMUNITION

Identifiers:

(U) \*TANK AMMUNITION, M-1002 AMMUNITION, MULTIPURPOSE AMMUNITION

**System Description:**

The M1002 cartridge consists of a propulsion/ignition system and an inert projectile. The propulsion/ignition system comprises a combustible cartridge case with metal base, M125 electric primer, and M14 propellant. The inert sabot projectile consists of an aluminum body with conical stabilizer and tracer, and a steel nose with plastic simulated nose switch. The conical stabilizer results in high drag, which limits its range to better fit existing training areas. The nose switch permits simulated setting of the projectile for the "air" or "ground" mode. There is no fuze. The M1002 is an acquisition category III program.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Cannon- Cartridge- 120mm- TPMP-T M1002

**Reference** (Smyers and Blankenship, 2007):

Smyers, P., & Blankenship, C. (2007). System Assessment (SA) for the Produced in Support of a Full Materiel Release Decision for the Cartridge, 120mm, Target Practice Multi-Purpose with Tracer, M1002: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB334365.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*TEST AND EVALUATION, \*OPERATIONAL EFFECTIVENESS, \*CARTRIDGES, \*TRAINING AMMUNITION, SURVIVABILITY, ANTITANK AMMUNITION, RELIABILITY, TRACER AMMUNITION, STORAGE

Identifiers:

(U) \*M1002 CARTRIDGES, M830A1 CARTRIDGES, CCF(COMPUTER CORRECTION FACTOR)

**System Description:**

The M1002 cartridge consists of a propulsion/ignition system and an inert projectile. The propulsion/ignition system is comprised of a combustible cartridge case with metal base, M125 electric primer, and M14 propellant. The cartridge is insensitive munitions-compliant in its PA 171 packaging container. The inert sabot projectile consists of an aluminum body with a conical stabilizer and tracer and a steel nose with plastic simulated nose switch. The conical stabilizer results in high drag, which

limits its range to better fit existing training areas. The nose switch permits simulated settings of the projectile for the "air" or "ground" mode. There is no fuze. The M1002 is an acquisition category III program.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Cannon- Cartridge- 120mm- TPMP-T XM1002

**Reference (Smyers, 2005):**

Smyers, P. (2005). System Evaluation Report (SER) for the XM1002 120mm Target Practice Multi-Purpose with Tracer (TPMP-T) Cartridge: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 51057987 / 2005-AEC-XXXX / XA-AEC/ALEX. DTIC ADB307216.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

190300 - Combat Vehicles

Descriptors:

(U) \*TEST AND EVALUATION, \*TARGET ACQUISITION, \*MILITARY TRAINING, \*TANKS(COMBAT VEHICLES), \*CARTRIDGES, \*TRACER AMMUNITION, MILITARY REQUIREMENTS, DECISION MAKING, SURVIVABILITY, PERFORMANCE(ENGINEERING), FIRING TESTS(ORDNANCE), OPERATIONAL EFFECTIVENESS

**System Description:**

The XM1002 cartridge consists of a propulsion/ignition system and an inert projectile. The propulsion/ignition system is comprised of a combustible cartridge case with metal base, M125 electric primer, and M14 propellant. The inert sabot projectile consists of an aluminum body with conical stabilizer and tracer, and a steel nose with plastic simulated nose switch. The conical stabilizer results in high drag, limiting range to better fit existing training areas. The nose switch permits simulated setting of the projectile for the "air" or "ground" mode. There is no fuze.

The XM1002 120mm TPMP-T cartridge will be fired from M1A1- and M1A2-series tanks in training. Except for terminal effects, it is intended to provide tank crews with live fire training that accurately reflects what they can expect to see in combat firings of High-Explosive Anti-Tank, Multi-Purpose, Tracer M830A1 tactical cartridges. Training with the XM1002 should allow crews to maximize the effectiveness of the M830A1 in combat. The XM1002 will replace the current M831A1 training cartridge. The XM1002 cartridge consists of a propulsion/ignition system and an inert projectile. The propulsion/ignition system is comprised of a combustible cartridge case with metal base, M125 electric primer, and M14 propellant. The inert sabot projectile consists of an aluminum body with conical stabilizer and tracer, and a steel nose with plastic simulated nose switch. The conical stabilizer results in high drag, limiting range to better fit existing training areas. The nose switch permits simulated setting of the projectile for the "air" or "ground" mode. There is no fuze.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- CCTT

**Reference** (Gill et al., 2000):

Gill, L., Swiger, A., Parks, D., Silva, R., & Schiffuer, F. (2000). System Assessment (SA) for the Close Combat Tactical Trainer (CCTT): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB263977.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

050600 - Humanities and History

120400 - Operations Research

Descriptors:

(U) \*COMPUTERIZED SIMULATION, \*CLOSE SUPPORT, \*COMBAT SUPPORT, \*MILITARY TRAINING, MILITARY PERSONNEL, MILITARY STRATEGY, TRAINING DEVICES, TEST METHODS

Identifiers:

(U) CCTT(CLOSE COMBAT TACTICAL TRAINERS)

**System Description:**

The CCTT is a real-time, interactive training system used to train heavy forces for ground combat. The CCTT is a simulation system wherein various simulated elements replicating actual combat vehicles, weapon systems, and command and control elements are networked for fully interactive collective task training on computer-generated terrain. Because the vehicle simulators emulate the capabilities and performance of the actual combat systems, the simulation system allows for the conduct of tactical operations in a totally simulated environment.

The CCTT system consists of training hardware, software, CLS, and training support packages. The training hardware consists of a network of combat vehicles simulators and workstation emulators that function as the vehicles and supporting elements of a tactical combat organization, along with supporting contractor-operated control stations. The manned simulators are connected to workstations and other hardware by cables that are securely tied off and hidden. The training software consists of three main components: application software (software version 7.04); operating system and run-time environment software; and diagnostic software. The CLS element consists of maintenance technicians, operations personnel, and operators for the mission control workstations such as the SAP stations, AAR stations, maintenance console (MC), and master control console (MCC). The training support packages include Education Through Computer Assisted Training Technology (EDUCATT) to facilitate soldier orientation training on the CCTT system and STRUCCTT exercises to support tactical mission training.

The site configuration at Fort Benning supported the conduct of FOTE 1b with 14 M1A1s (Tank simulators), 14 M2/M3s (Bradley Fighting Vehicles-Mech Inf/Cav), 1 FIST-V (Fire Support Team Vehicle), 1 M113 (Personnel Carrier), 1 High Mobility Multipurpose Wheeled Vehicle (HMMWV), 2 Dismounted Infantry Modules (DIMs), and AAR stations. A local area network (LAN) connected the simulators and workstations. The system supported up to two simultaneous company-level or five simultaneous platoon-level training exercises.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- CCTT

**Reference** (Gill, 2002):

Gill, L. (2002). System Assessment (SA) for the Close Combat Tactical Trainer (CCTT) Primary 1 (P1) Temperate Database: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB284295.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)  
Fields and Groups:

050600 - Humanities and History

120400 - Operations Research

Descriptors:

(U) \*COMPUTERIZED SIMULATION, \*CLOSE SUPPORT, \*COMBAT SUPPORT, DATA BASES,  
MILITARY OPERATIONS, MILITARY PERSONNEL, LAND WARFARE, MILITARY STRATEGY,  
DECISION MAKING, TRAINING DEVICES, INTERACTIONS, WEAPON SYSTEMS,  
PERFORMANCE(ENGINEERING), TEST METHODS, OPERATIONAL EFFECTIVENESS, COMBAT  
VEHICLES, COMPUTER APPLICATIONS, SYSTEMS ANALYSIS, MILITARY TRAINING, TACTICAL  
WARFARE

Identifiers:

(U) \*CCTT(CLOSE COMBAT TACTICAL TRAINER), \*PRIMARY 1-TEMPERATE DATABASE,  
SA(SYSTEM ASSESSMENT)

**System Description:**

The CCTT is a real-time, interactive training system used to train heavy forces for ground combat. The CCTT is a simulation system wherein various simulated elements replicating actual combat vehicles, weapon systems, and command and control elements are networked for fully interactive collective task training on computer-generated terrain. Because the vehicle simulators emulate the capabilities and performance of the actual combat systems, the simulation system allows for the conduct of tactical operations in a totally simulated environment.

The CCTT Primary I-Temperate (P1) database assessment was conducted to ensure that the database is reliable and suitable prior to input for full materiel release. The terrain database resources provided are treated like an operating system, and are vendor supplied and the database consists of several training environments representing Germany (called the P11 database). The P1 database is designed to support the scene content management and image density performance requirements. Because of the role of features on the earth's surface in providing cover and concealment and in limiting the range of vision, the database provides equivalent characteristics to the areas being simulated. The tactically significant characteristics of the environment should be accurately portrayed. The terrain database should provide the features required to support evasive maneuvering, including dodge and hide movements to avoid anti-armor missiles. The terrain database provides routes that cover and conceal a vehicle's movement consistent with the contour interval of the associated 1:50,000 map. In addition to the P1 and P2 terrain databases, terrain databases have been fielded for Fort Hood, Kosovo, and Korea.

The site configuration at Grafenwoehr supported the FOE with 14 M1A1s (Tank simulators), 14 Bradley Fighting Vehicle (Mech Inf/ Cav) (M2/M3s), 1 High Mobility Multipurpose Wheeled Vehicle (HMMWV), and AAR stations. A local area network (LAN) connected the simulators and workstations. The system supported one company-level or three simultaneous platoon-level training exercises.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- CHCS

**Reference** (Rice and Fuentes, 2005):

Rice, G., & Fuentes, M. (2005). System Evaluation Report (SER) for the Composite Health Care System (CHCS) II, Block 2: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 52158024 / 2004-DO-MDBD-CHCSB-A1582. DTIC ADB311043.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

**Fields and Groups:**

060500 - Medicine and Medical Research

**Descriptors:**

(U) \*MILITARY MEDICINE, \*MEDICAL SERVICES, TEST AND EVALUATION, TEST EQUIPMENT, SYSTEMS ANALYSIS, OPERATIONAL EFFECTIVENESS

**Identifiers:**

(U) SER(SYSTEM EVALUATION REPORT), IOT(INITIAL OPERATIONAL TEST)

**System Description:**

The CHCS II (all releases) will support the new functions in the computer-based patient record (CPR) . The CHCS 11 will also will integrate functions that currently exist, are in development, or are planned in more than 50 Department of Defense (DoD) and Service-specific legacy and interim migration Automated Information Systems (AIS) . CHCS II provides the foundation for standardization for military health care and critical to the success of the Tri-Service Health Care (TRICARE) System .

a. The centerpiece of the CHCS II is a CPR (and later a G-CPR) for all eligible military health care beneficiaries . The target goal for the CPR is to have the right clinical information available to the right person, at the right time, at the right place, and at a reasonable cost . The CHCS II product will gather, store, and transmit computerized information about a patient's lifetime health status and health care . This application enables the rapid access and transfer , through telecommunications, of relevant patient information for regional and remote treatment of injuries and illnesses (telemedicine) worldwide . CHCS II will also support patient referrals to , and consultations with, specialists within a regional area or at distant locations . Eventually, the CPR will provide a paperless, film-less health care record that will be a confidential and comprehensive record of care for the full continuum of theater and peacetime care . The CPR will also provide links to external knowledge sources, interconnect network providers, and provide clinical decision support and rationale for care rendered . For the first time, the CPR will give health care providers instant access to a continuous and coherent chronology of the health care history of each of their patients.

b. The CHCS 11 is an evolutionary program with two major aspects : (1) new methods and functions in the CPR, and (2) the migration of appropriate functionality of current systems . A core set of hardware and software will support the migration of current functions associated with inpatient and outpatient care, guarantee adequate protection of sensitive medical information , and allow the exchange of information over a wide communications network . Moreover, the CHCS II will provide integrated, critical functions that are currently not available . The CHCS II core system will be established on a TRICARE region-by-region basis at the garrison medical treatment facilities (MTFs) . The core system will be expanded in a series of incremental steps . The core system will make maximum use of existing hardware and software and promote the use of a common presentation layer (user workstation) and integrated database .

c. The CHCS 11 Block 2 will add the following functional capabilities to the existing Block 1 :

- Dental Graphical Charting and Structured Documentation for: Operative dentistry, endodontics, periodontics, preventive dentistry, and limited prosthodontic and limited oral maxillofacial surgery .
- Forensic charting .
- Examinations and evaluations .
- Identification of International Classification of Diseases and Clinical Data Test codes with linking of diagnoses and treatments .
- Workload and individual readiness calculation.
- Optometric Order Entry (Spectacle Request Transmission System II (STS II)) .

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Computer- AIS- RCAS

**Reference** (Berman and Dionisio, 2001):

Berman, S. L., & Dionisio, R. (2001). System Evaluation Report (SER) for the Reserve Component Automation System (RCAS) Increment 4/5: U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. ATEC-2001-LU-C4-1658C. DTIC ADB266066.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

120700 - Computer Systems

150600 - Military Operations, Strategy and Tactics

Descriptors:

(U) \*MILITARY RESERVES, \*AUTOMATION, \*MOBILIZATION, \*JOINT MILITARY ACTIVITIES, TEST AND EVALUATION, COMPUTER PROGRAMS, MILITARY OPERATIONS, DEPLOYMENT, MANAGEMENT INFORMATION SYSTEMS, DECISION MAKING, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, REGRESSION ANALYSIS, ARMY EQUIPMENT, USER NEEDS, SYSTEMS ANALYSIS, MILITARY PLANNING

Identifiers:

(U) LUT(LIMITED USER TEST), RCAS(RESERVE COMPONENT AUTOMATION SYSTEM), OPERATION DESERT SHIELD, DESERT STORM, CAMIS(CONTINENTAL ARMY MANAGEMENT INFORMATION SYSTEM), RCAS COMPUTER PROGRAM

**System Description:**

The RCAS is an automated information system that supports the decision-making needs of commanders, staffs, and functional managers of the Reserve Component (RC) forces.

**Overall.** The RCAS provides an automated capability for the ARNG and USAR to accomplish day-to-day operations. When fully deployed, RCAS will link approximately 10,500 ARNG and USAR units from over 4,000 sites located in each of the 50 states, the District of Columbia, Guam, Puerto Rico, the Virgin Islands, Europe, and the Pacific Rim. When complete, RCAS will be comprised of seven increments. The PM RCAS has prepared an evolutionary acquisition strategy to develop and field the system in seven increments over seven years to all USAR and ARNG units. The RCAS employs personal computer (PC) workstations operating in a network environment running GOTS, COTS, and developed application software.

**a. Increment 1** provided full-time, bi-directional telecommunications, a standard COTS office automation suite, and centralized network and system management with distributed network visibility.

**b. Increment 2** updated, upgraded and expanded Increment 1 by adding Release 1.1 and Release 2.0 with the following features.

(1) Release 1.1 upgraded the network operating system for servers and workstations to Microsoft (MS) Windows New Technology (NT) 4.0; replaced MS Mail with MS Exchange at all sites except the small site; provided Remote Access services for classified communication; included a web server; and provided a firewall for Internet access for e-mail.

(2) Release 2.0 provided logistics functionality with GOTS applications for the Unit Level Logistics System - Ground (ULLS-G) and Unit Level Logistics System-S4 (ULLS-S4) users, along with Disk Operating System (DOS) configured workstations for Standard Property Book System-Revised (SPBS-R) users; added a database server for the Sybase database running on the Reduced Instruction Set Computing (RISC) Hewlett Packard (HP) UX Network Management System (NMS) platform and added a data exchange server on the MS NT network platform.

**c. Increment 3.0** updated the COTS and GOTS applications and added Commanders Clipboard (CC) and Force Authorizations (FA) functions to the RCAS baseline.

**d. Increment 4/5.** Increment 4/5 added GOTS and COTS applications that enhanced, upgraded and expanded existing applications and functions in the RCAS baseline. Increment 4/5 includes the functionality provided by the following applications:

Army Training Requirements Reservation System (ATRRS)\*/\*\*\*\*

Authorization and Requirements (AR)\*\*\*

Command Management System (CMS)\*\*\*

Equipment Modernization (EM)\*\*\*

Federal Logistics Catalog (FEDLOG)\*/\*\*\*

Force Management (FM)\*\*\*

Integrated Database Viewer (IDV)\*\*\*\*

Military Personnel Orders (MILPO)\*\*\*\*  
Organizational Authority (OA)\*\*\*  
Occupational Health Manager (OHM)\*\*I\*\*\*\*  
Range and Training Land Program-Automated System (RTLPA)\*\*\*\*  
Retirement Points Accounting Management (RPAM)\*\*\*\*  
Standard Property Book System-Revised (SPBS-R)\*I\*\*\*\*  
Unit Personnel System (UPS)\*\*\*  
Unit Level Logistics System-Ground (ULLS-G)\*I\*\*\*\*  
Unit Level Logistics System-S4 (ULLS-S4)\*I\*\*\*\*  
\*GOTS, \*\*COTS, \*\*\*Enhanced, \*\*\*\*New

**e. Increment 6** will provide Mobilization Planning for personnel and add Safety and Occupational Health (SOH).

**f. Increment 7** will include additional Mobilization Planning (Medical/Logistics/Training) and additional enhancements to GOTS and COTS.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Computer- AIS- RCAS

**Reference** (Lohman and Shuler, 2003):

Lohman, D., & Shuler, D. (2003). System Evaluation Report (SER) for the Reserve Component Automation System (RCAS) Increment 8: U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB290971.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

050100 - Administration and Management

050200 - Information Science

050900 - Personnel Management and Labor Relations

Descriptors:

(U) \*MILITARY RESERVES, \*AUTOMATION, \*MANAGEMENT INFORMATION SYSTEMS, \*INFORMATION SYSTEMS, \*PERSONNEL MANAGEMENT, DATA BASES, NATIONAL GUARD, DECISION MAKING, DATA TRANSMISSION SYSTEMS, SURVIVABILITY, LOGISTICS MANAGEMENT, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, DATA ACQUISITION, ARMY OPERATIONS, MILITARY COMMANDERS

Identifiers:

(U) EXPORT CONTROL, SER(SYSTEM EVALUATION REPORT), LIMITER USER TEST,

\*RCAS(RESERVE COMPONENT AUTOMATION SYSTEM)

**System Description:**

The RCAS is an Automated Information System (AIS) that supports the decision-making needs of commanders, staffs, and functional managers of the Reserve Component (RC) forces. RCAS provides an automated capability for the ARNG and USAR to support administrative, day-to-day operations, as well as information necessary to facilitate mobilization planning and execution.

a. The RCAS consists of two major subsystems:

- Data and Applications Subsystem, which includes program-developed, Commercial-Off-The-Shelf (COTS), and Government-Off-The-Shelf (GOTS) hosted software applications that meet the functional requirements of the RCAS;

- Delivery Subsystem, which provides inter- and intra-site connectivity, network management, COTS software, hardware, and telecommunications, database servers, individual workstations, and supports

functional requirements through the use of COTS and re-hosted hardware (i.e., Government Furnished Equipment (GFE).

b. The three applications provided in Increment 8 are:

- External Interface Error Reporting (EIER),
- Permanent Orders System (POS), and
- Integrated Database Viewer-Safety and Occupational Health Version, Levell Reports (IDV-SOH).

c. The PM RCAS has prepared an evolutionary acquisition strategy to develop and field the system in eight increments. When fully deployed, RCAS will link approximately 10,500 ARNG and USAR units from over 4,000 sites located in each of the 50 states, the District of Columbia, Guam, Puerto Rico, the Virgin Islands, Europe, and the Pacific Rim.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Computer- Client/Server- CMIS

**Reference** (Tufts et al., 1998):

Tufts, S. K., Stiles, S. P., & Tipton, N. T. (1998). System Evaluation Report (SER) for the Configuration Management Information System (Cmis) Version (V.)5.1.3.1: U.S. Army Test and Evaluation Command (ATEC) (Formerly U.S. Army Operational Test and Evaluation Command- OPTEC), ATTN: CSTE-EAC-CC, Park Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB235011.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

050100 - Administration and Management

120500 - Computer Programming and Software

Descriptors:

(U) \*COMPUTER PROGRAMS, \*MANAGEMENT INFORMATION SYSTEMS, \*CONFIGURATION MANAGEMENT, TEST AND EVALUATION, ACCEPTANCE TESTS, MARINE CORPS, AUTOMATION, DECISION MAKING, INFORMATION SYSTEMS, NAVAL PERSONNEL, SITES, TEAMS(PERSONNEL), OPERATIONAL EFFECTIVENESS, AIR FORCE PERSONNEL, MISSIONS, LOGISTICS, SYSTEMS ANALYSIS, MARINE CORPS PERSONNEL

Identifiers:

(U) AIS(AUTOMATEDINFORMATION SYSTEM)

**System Description:**

a. The Configuration Management (CM) functionality of CMIS complies with standards defined in MIL-STD 973, Configuration Management.

b. The CMIS was originally designed to support MM throughout the Department of Defense (DoD) as the standard AIS for item configuration, engineering, and technical data management functions. The CMIS provides ready access to configuration controlled information, such as drawings and specifications, as well as information reflecting pending and approved changes to controlled items. The MM users will routinely need the CM data from CMIS for procurement, item management, and other related logistics activities.

c. The CMIS uses an open systems architecture. The CMIS relational database organizes data into tables and columns for rapid query and retrieval. The CMIS provides life cycle, closedloop configuration management for equipment and components. The system defines and maintains configuration baselines for a weapons system to the lowest level of replacement or maintenance (component, assembly, or piece parts). The CMIS identifies and maintains engineering and logistics technical data required to build, maintain, overhaul, and repair the configured items that comprise each baseline.

d. The CMIS is a client/server architecture designed to capitalize on the benefits of distributed processing. The client is a workstation, which is typically an IBM compatible Intel 40486 based or higher personal

computer. These workstations use MS Windows applications to support on-line input and processing. The server platform must be UNIX based system. The server must have the memory, disk space, and processing capacity to host the Oracle Relational Database Management System (RDBMS). The minimum hardware requirements are below:

- Server Platform: Sun Sparc/HP 9000/RS 6000
- Processor: Intel Pentium II or equivalent with processor speed of 200 MHz
- Random Access Memory (RAM): 128 MB
- Cache Memory: 512 KB
- Application Server: 1 disk unit with 2.2 GB capacity
- Database Server: 4 disk units with 2.2 GB each
- Off-line storage media: 1/4" tape cartridge or 4mm/8mm Digital Analog Tape
- Recommended Workstation Platform:
- MS Windows 3.11/ MS Windows 95/ MS Windows NT
- Processor: Intel Pentium with processor speed of 100 MHz
- RAM: 32MB
- Cache Memory: 512 KB
- Disk Storage: 2.2 GB
- Monitor: VGA
- Mouse: Standard serial mouse
- Keyboard: Standard keyboard

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Computer- JCALS

**Reference** (Hill et al., 2002):

Hill, D. T., Flint, K. T., Santini, J., Sliwinski, S., & Card, R. K. (2002). System Evaluation Report (SER) for the Joint Computer-Aided Acquisition and Logistics Support (JCALS) for SWP 3.1. Limited User Test (LUT) and Evaluation for the Army, Navy, Marine Corps, and Air Force. U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report # 30318781.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)  
Joint Computer-aided Acquisition and Logistics Support (JCALS)  
Publications .Technical Manuals

**System Description:**

JCALs is a multiservice, centralized, geographically distributed client/server digital system designed to process all the data and all the information required to manage, control, and produce each Service's Technical Manuals (TMs) at their designated TM processing sites. The Defense Information System Network (DISN) provides interservice or wide area network (WAN) connectivity. A Fiber-optic Distributed Data Interface (FDDI) Ethernet provides local area network (LAN) connectivity among workstation servers, workstations, peripherals, collocated legacy systems, and the WAN (via Internet Protocol (IP) Routers.) Each functional user site is provided one or more JCALS client/server nodes based upon the site's processing requirements and organizational dispersion. All JCALS data are stored in the Integrated Weapon System Database (IWSDB)--a centralized, physically distributed relational database that is administered using the Oracle® program. Data management and access are provided by the Global Data Management System (GDMS), which provides transparent access to data anywhere in the system regardless of where the data are stored, formatted, or accessed. Although functional user system administration personnel perform systems administration at each site, JCALS system management is centrally provided by the SOSC.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Computer- Simulation- Models- MATH

**Reference** (Guernsey and Puckett, 1998):

Guernsey, G. G., & Puckett, F. D. (1998). System Evaluation Report (SER) for the Combined Site Acceptance Test (SAT) and Operational Test and Evaluation (OT&E) of the Math Models (Wholesale) Version 1.0: U.S. Army Test and Evaluation Command (ATEC) (Formerly U.S. Army Operational Test and Evaluation Command- OPTEC), ATTN: CSTE-EAC-CC, Park Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB233592.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

120700 - Computer Systems

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*MATHEMATICAL MODELS, \*INVENTORY CONTROL, \*COMPUTER PROGRAM VERIFICATION, TEST AND EVALUATION, DATA BASES, SOFTWARE ENGINEERING, ACCEPTANCE TESTS, LOGISTICS MANAGEMENT, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, DATA ACQUISITION, SYSTEMS ANALYSIS, CLIENT SERVER SYSTEMS

**System Description:**

MATH was originally designed to support logistics inventory analysis throughout the Department of Defense (DoD). For the Navy, MATH will be used to evaluate proposed inventory methods, models, and parameters. MATH will be an analytical tool for Wholesale Operations Research Analysts (ORAs) in the Navy's Planning and Operations Research Analysis Directorate of the Naval Inventory Control Point (NAVICP).

a. The Wholesale ORAs will use MATH to evaluate proposed inventory policies and determine shortage cost values. MATH will provide an improved capability for those Wholesale ORAs to investigate selected MM parameter changes. MATH provides the "what-if" capability to estimate how changes in parameter values would affect quantities and levels (stockage) setting and performance (requisition satisfaction) projections.

b. MATH is a stand-alone, point-in-time, client-server application for use in inventory management (procurement, performance, and investment) at the NAVICP. MATH combines the functionality of the Navy's Computational And Research Evaluation System (CARES) with that of the Army's Supply Performance Analyzer (SPA). The client side of MATH contains the Graphical User Interface (GUI) that handles all user inputs and help screens. The server side of MATH includes three Computer Software Configuration Items (CSCIs)--CARES/SPA, Economic Order Quantity Variable Safety Level (EOQNSL), and Selected Essential item Stock for Availability Method (SESAME95). The CARES/SPA CSCI controls the wholesale and retail batch processes and interfaces with the other two CSCIs and the database. EOQNSL is a DoD-standard math model that computes item quantities, levels, and performance projections for CARES/SPA. SESAME95 is the Army math model that computes the item performance at the wholesale level, for example, wholesale average wait time, required to attain a specified weapon system performance at the retail level of operational availability. The IRDIRBS database is used to obtain and store CARES/SPA related data. Any references to "database" pertain to the IRDIRBS database.

c. The database is loaded with data files quarterly via scripts run by the NAVICP Data Base Administrator (DBA). These data files are created by reformatting and summarizing item input data (STRAT files) that go into the current Navy CARES model and adding parameter values based on the item characteristics. Figure 1-2 depicts the flow of data into the database.

d. The future implementation of MATH within the Navy is dependent upon executive-level decisions in process. Those decisions will define a Program Management Responsibility Transfer (PMRT) for MATH from the JLSC, WPAFB, OH, to the Naval Supply Systems Command (NAVSUP), Mechanicsburg, PA. Figure 1-3 indicates system connectivity and physical laydown for the MATH SAT.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Computer- Test- NGATS

**Reference** (Hall et al., 2009):

Hall, J., Harpel, B., Lewis, J., Suchowski, J., Dimpfel, F., Serabro, G., Dangerfield, D., & Cook, D. (2009). Operational Test Agency Evaluation Report (OER) for the Next Generation Automation Test System (NGATS) Version 6: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. DTIC ADB348855.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA), OTA Assessment Report (OAR), OTA Milestone "x" Assessment Report (OMAR), OTA Evaluation Report (OER), OTA Follow-on Evaluation Report (OFER), Operational Test Report (OTR), Abbreviated Operational Test Report (AOTR), Army Input to the OTA Report (AIOR)

\*military vehicles, \*computer programs, \*logistics support, \*off the shelf equipment, modular construction, operational effectiveness, test facilities, shops(work areas), automation, military facilities, test and evaluation, survivability

Fields and Groups:

120500 - Computer Programming and Software  
150500 - Logistics, Military Facilities and Supplies  
190300 - Combat Vehicles

Descriptors:

(U) \*MILITARY VEHICLES, \*COMPUTER PROGRAMS, \*LOGISTICS SUPPORT, \*OFF THE SHELF EQUIPMENT, MODULAR CONSTRUCTION, OPERATIONAL EFFECTIVENESS, TEST FACILITIES, SHOPS(WORK AREAS), AUTOMATION, MILITARY FACILITIES, TEST AND EVALUATION, SURVIVABILITY

**System Description:**

The NGATS is a mobile, modular test system consisting of flexible and configurable ATS hardware and software. NGATS consists of two International Organization for Standardization (ISO) 20-foot modified shelters with Environmental Control Units (ECU), two Heavy Expanded Mobility Tactical Truck (HEMTT) Load Handling Systems (LHS), and a 60 kilowatt (kW) Tactical Quiet Generator (TQG). One ISO shelter is used for housing the ATS and the other for storing the TPS. NGATS possesses an internal diagnostic software capability enabling self-test and system maintenance. NGATS utilizes Commercial Off-The-Shelf (COTS) test equipment, open architecture, and is compliant with Next Test (NX Test) industry standards. When employed, NGATS provides a diagnostic capability for the 94Y Integrated Family of Test Equipment (IFTE) Military Occupational Specialty (MOS) maintainer. Inoperable weapon system LRUs and SRUs are removed from the platform and work ordered to NGATS. NGATS diagnoses and fault isolates to the SRU level by using the weapon system platform TPS. It possesses a general purpose software loader and verifier capability for weapon system components.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to

Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458:

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**System Short Name:** SER- Computer- Test- SPORT

**Reference** (Slaughter et al., 1998):

Slaughter, D. A., Lee, I., & Knuckles, S. (1998). System Evaluation Report (SER) for the Soldier's Portable on-System Repair Tool: U.S. Army Test and Evaluation Command (ATEC) (Formerly U.S. Army Operational Test and Evaluation Command- OPTEC), ATTN: CSTE-EAC-CC, Park Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB233933.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

120500 - Computer Programming and Software

140200 - Test Facilities, Equipment and Methods

Descriptors:

(U) \*PORTABLE EQUIPMENT, \*TEST EQUIPMENT, \*COMPUTER AIDED INSTRUCTION, MATERIEL, MILITARY FACILITIES, DECISION MAKING, ACQUISITION, SURVIVABILITY, REPAIR, ELECTROMAGNETIC INTERFERENCE, RELEASE, USER NEEDS, SYSTEMS ANALYSIS, ORDNANCE, ALABAMA, ELECTROMAGNETIC COMPATIBILITY, TOOL KITS

Identifiers:

(U) AN/PSM-95, SPORT(SOLDIER'S PORTABLE ON SYSTEM REPAIR TOOL), ATE(AUTOMATIC TEST EQUIPMENT)

**System Description:**

The SPORT is based on the Miltope Portable Computer Unit (PCU) SIOG, which is a commercial product. The SPORT system consists of the CDA, the IEC, and various instrumentation cards that may be configured for specific test and diagnostic requirements. It is designed to augment the Built-In Test (BIT)/Built-In Test Equipment (BITE) of various weapon systems within the Army. Also, it will interface with current bus systems on various weapon systems. The SPORT will also be used as a delivery device for Electronic Technical Manuals (ETM) and IETMs and as a software loader verifier. The CDA operates as a portable maintenance aid and delivery device for ETMs and IEMs. The CDA is a Pentium processor based tablet type computer available separately or with a combination of digital multimeter, 1553B data bus, and/or one of several type III PC cards. The IEC augments the CDA capability by allowing use of additional bus and/or instrumentation card. The IEC consists of three circuit card slots: one Industry Standard Architecture (ISA)/Peripheral Component Interconnect (PCI) bus full-size slot and two ISA full-size slots. The IEC operates within the same power requirements as the CDA, except for the internal battery. The IEC is available with one or a combination of oscilloscope, counter-timer, and analog/digital (AID), digital/ analog (D/A) circuit cards.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- CROWS XM101

**Reference** (ATEC, 2004):

ATEC. (2004). System Evaluation Report (SER) for the Common Remotely Operated Weapon Station (CROWS) Milestone (MS) B: U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB297716.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

190500 - Fire Control and Bombing Systems

190600 - Guns

Descriptors:

(U) \*MACHINE GUNS, \*REMOTE CONTROL, TEST AND EVALUATION, RISK, SURVIVABILITY, PROTOTYPES, ARMY EQUIPMENT, CONFIGURATIONS, MISSIONS, SYSTEMS ANALYSIS, GRENADES

Identifiers:

(U) CROWS(REMOTELY OPERATED WEAPON STATION)

**System Description:**

From 2005 MANPRINT Assessment:

The XM101 Common Remotely Operated Weapons Station (CROWS) is a light-weight remote weapon station capable of individually mounting and firing several weapons. The CROWS will provide protection and enhanced target acquisition, identification and engagement capabilities to light armored vehicles in units whose mission currently places the unprotected gunner at high risk of engagement from enemy - direct and indirect fire weapon systems. These units include Infantry, Artillery, Armor, Cavalry, Engineer, Chemical and Military Police (MP) units performing missions across the entire operational continuum.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- CS

**Reference** (Finkel and Walker, 1999):

Finkel, M., & Walker, J. (1999). System Evaluation Report (SER) for the Containerized Shower (CS): U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 92118091. DTIC ADB244718.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

060900 - Hygiene and Sanitation

130400 - Containers and Packaging

Descriptors:

(U) \*MILITARY EQUIPMENT, \*SHOWER FACILITIES, TEST AND EVALUATION, MILITARY REQUIREMENTS, SYSTEMS ANALYSIS, FIELD EQUIPMENT, CONTAINERIZING

**System Description:**

The CS is composed of 12 fiberglass shower stalls mounted inside an 8-by-8-by-20-foot International Standardization Organization (ISO) container. The container is equipped with interior lighting, ventilation, towel hooks, hot and cold running water, individual temperature controls in each shower, an on-board water pump and ejection system, and a small heater to keep the water from freezing when not in use. It also includes an attached softwall shelter, shave stands with mirrors, water heater, water hoses, and power cables. All ancillary equipment is stored in the container.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

**System Short Name:** SER- CSPBA

**Reference** (Che-Ling and Jastrab, 2002):

Che-Ling, C. L., & Jastrab, G. (2002). System Evaluation Report (SER) for the Concealable Stab Protective Body Armor (CSPBA): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 21068634. DTIC ADB277924.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

230400 - Protective Equipment

Descriptors:

(U) \*BODY ARMOR, METALS, HIGH VELOCITY, OPERATIONAL EFFECTIVENESS, SYSTEMS ANALYSIS, PROTECTIVE CLOTHING, JACKETS, VESTS

Identifiers:

(U) CSPBA(CONCEALABLE STAB PROTECTIVE BODY ARMOR), PROTECTIVE VESTS

**System Description:**

a. The CSPBA is a custom fit, soft under-vest that provides protection to the front and back of the torso. The system consists of two components - a launderable, outer shell carrier (front and back) and flexible ballistic inserts. The ballistic inserts are made with soft, pliable armor material such as Kevlar®, Spectra Shield®, or Gold Flex™.

b. The CSPBA will be worn underneath the soldier's outer garment, such as the Battle Dress Uniform (BDU) blouse, and is designed to provide maximum concealability. The protection provided by the ballistic inserts will be against handgun (9mm, full metal jacket (FMJ), 124-grains) and ice pick threats.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- DCGS-A

**Reference** (Outland et al., 2008):

Outland, T., Chausse, J., Rivera, E., Fisher, R., McGurk, M., Sansone, C., Birchard, P., Smoot, D., Wong, N., Cieslak, T., & Lloyd, T. (2008). Operational Test Agency Assessment Report (OAR) for the Distributed Common Ground System - Army (DCGS-A). Version 3.0: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. ARMY EVALUATION CENTER ALEXANDRIA VA. DTIC ADB343417.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA), OTA Assessment Report (OAR), OTA Milestone "x" Assessment Report (OMAR), OTA Evaluation Report (OER), OTA Follow-on Evaluation Report (OFER), Operational Test Report (OTR), Abbreviated Operational Test Report (AOTR), Army Input to the OTA Report (AIOR)

\*decision making, \*software tools, \*military intelligence, materiel, technology assessment, army equipment, iraq, microcomputers, test and evaluation

\*dcgs-a(distributed common ground system-army)

Fields and Groups:

120500 - Computer Programming and Software

150400 - Military Intelligence

Descriptors:

(U) \*DECISION MAKING, \*SOFTWARE TOOLS, \*MILITARY INTELLIGENCE, MATERIEL,  
TECHNOLOGY ASSESSMENT, ARMY EQUIPMENT, IRAQ, MICROCOMPUTERS, TEST AND  
EVALUATION

Identifiers:

(U) \*DCGS-A(DISTRIBUTED COMMON GROUND SYSTEM-ARMY)

**System Description:**

This Operational Test Agency (OTA) Assessment Report (OAR) is issued as input to a Software Materiel Release decision for the Distributed Common Ground System-Army (DCGS-A) Version (V) 3.Op17 Final. This assessment is the U.S. Army Test and Evaluation Command (ATEC) review of the DCGS-A V3.0 which is being fielded as an urgent materiel release. SCOPE: DCGS-A software V3.Op17 Final is the second software version of three planned (Joint Intelligence Operations Capability - Iraq (JIOC-I)/DCGS-A V2, V3.0 and V3.1) to support the Warfighter in the near term, until the Program of Record (V4 and beyond) is fielded. DCGS-A V3.0 has been tested, demonstrated, and assessed on an Alienware Laptop Computer.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- DMS-A

**Reference** (Martin et al., 2003):

Martin, J., Wong, N., Manasco, C., Hoafat, W., Robinson, J., & Soreno, J. (2003). System Assessment (SA) for the Defense Messaging System-Army Extension into the Tactical Environment (DMS-A): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. dTIC ADB286900.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

250200 - Radio Communications

Descriptors:

(U) \*MESSAGE PROCESSING, \*TACTICAL COMMUNICATIONS, TEST AND EVALUATION, COMPUTER PROGRAMS, DECISION MAKING, PRODUCTION, INFORMATION SYSTEMS, SURVIVABILITY, DEMONSTRATIONS, COMPUTERS, ARMY EQUIPMENT, ENGINEERING, LOGISTICS, USER NEEDS, SYSTEMS ANALYSIS, SHORTAGES

Identifiers:

(U) JUICE(JOINT USER INTEROPERABILITY COMMUNICATIONS EXERCISE)

**System Description:**

The DMS-Army Service Extension into the Tactical Environment is the U.S. Army tactical implementation of the sustaining based DMS infrastructure. The DMS-Army provides the DMS messaging service to all Department of Defense (DoD) users, to include deployed tactical users, access to and from worldwide DoD locations, and interface to other U.S. government, allied, defense contractors, and other authorized users (e.g., academia) as needed. The DMS-Army will operate with current Simple Mail Transfer Protocol (SMTP) message systems, as necessary, to support the current and evolving needs of the Army's service extension to the tactical user.

DMS-A does not establish new networks, but is an application that rides over the existing Transmission Control Protocol/Internet Protocol (TCP/IP) and communication networks that exist throughout both the strategic and tactical environments, including but not limited to the following:

- Unclassified but Sensitive Internet Protocol Router Network (NIPRNet)
- Secret Internet Protocol Router Network (SIPRNet)
- Tactical High Speed Data Network (THSDN)

- Joint Worldwide Intelligence Communications System (JWICS)
- Mobile Subscriber Equipment (MSE)
- Tactical Packet Network (TPN)

The DMS-A consists of a backbone capability and user/client systems.

The message transfer capability is the TMS. The user agent/client systems, i.e., the DMS e-mail client software, must be integrated onto existing and emerging battlefield automation systems that are connected to the Area Common User System (ACUS). The TMS systems will provide a message server capability to interconnect the TOC LANs at each echelon using the ACUS network for message transport and to act as a gateway to joint deployed forces, legacy messaging systems, allies, and sustaining base. The Army Program Manager (PM) DMS-A is responsible for developing the backbone capability hosting the DMS software in the field. The PMs for each of the battlefield automation systems agreed to integrate the DMS UA software onto their platforms. However, these PM offices have not integrated the UA and groupware server software on their systems, and therefore, the DMS-A PMO must take on this responsibility.

The TMS suites serve primarily to pass mail to and from tactical subordinate TOC servers and to strategic users. Three transit cases contained the TMS systems which include the system components (three CF-28 Panasonic Toughbook laptops, one Cisco 3620 router and switch, various cables, and in some cases a TACLANE inline encryptor (INE)). Each suite interfaces with a communications node (Tri-Service Tactical Communications (TRITAC), JWICS, MSE, etc.) to receive and send messages. Each laptop operates using Windows NT 4.0 and DMS Version 3.0 Gold, a Defense Information Systems Agency (DISA) managed software program based upon adaptation of Microsoft Exchange. Each TMS suite includes its own ground transportation (High-Mobility Multi-purpose Wheeled Vehicle (HMMWV), tent and generator. One TMS set includes three suites of equipment, with each suite servicing one of three separate security domains: (1) Unclassified, (2) Secret, and (3) Top Secret Collateral (TS/C) and Top Secret/Sensitive Compartmented Information (TS/SCI). Two TMS sets will be fielded to each corps (and eventually each division), and additional single sets will be fielded at Echelon Above Corps (EAC) level. Two soldiers with the MOS 74B man each TMS suite. Supervisors will be assigned to selected teams. Each suite is required in the Operational Requirements Document (ORD) to have its own vehicle, shelter, power, and support equipment.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- DMS-A

**Reference** (Hoafat et al., 2004):

Hoafat, W. R., Martin, J., Sereno, J., Wong, N., Powell, M., Robertson, J., & Foley, J. (2004). System Assessment (SA) for the Defense Messaging System - Army Extension into the Tactical Environment (DMS-A): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB302854.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

120700 - Computer Systems

250200 - Radio Communications

Descriptors:

(U) \*DEFENSE SYSTEMS, \*MESSAGE PROCESSING, \*TACTICAL COMMUNICATIONS, COMPUTER PROGRAMS, COMPUTERIZED SIMULATION, SOFTWARE ENGINEERING, DECISION MAKING, INFORMATION SYSTEMS, SURVIVABILITY, ARMY EQUIPMENT, LOGISTICS, COMPUTER NETWORKS, TACTICAL WARFARE

Identifiers:

(U) DMS-A(DEFENSE MESSAGE SYSTEM-ARMY), TMS(TACTICAL MESSAGING SYSTEM),  
JUICE(JOINT USER INTEROPERABILITY COMMUNICATIONS EXERCISE)

**System Description:**

DMS-A encompasses all of the hardware and software necessary to extend the strategic DMS capability for organizational message exchange to the tactical environment.

The DMS-A consists of three transit cases that contain the TMS suite. The components of the suite include three CF-28 Panasonic Toughbook laptops, one Cisco 3620 router and switch, and various cables. Each suite interfaces with a communications node (Tri-Service Tactical Communications, Joint Worldwide Intelligence Communications System, Mobile Subscriber Equipment (MSE), etc.) to receive and send messages. The User Agent (UA)/client systems, i.e., the DMS e-mail client software, must be integrated onto existing and emerging battlefield automation systems that are connected to the Area Common User System (ACUS). The TMS suites will provide a message server capability to interconnect the Tactical Operation Center (TOC) Local Area Network (LAN)s at each echelon using the ACUS network for message transport and to act as a gateway to joint deployed forces, legacy messaging systems, allies, and sustaining base. The TMS suites serve primarily to pass mail to and from tactical subordinate TOC servers and to strategic users. Each laptop operates using Windows NT 4.0 and DMS Version 3.0 Gold, a Defense Information Systems Agency (DISA) managed software program based upon adaptation of Microsoft Exchange. Each TMS suite includes its own ground transportation (High-Mobility Multi-purpose Wheeled Vehicle (HMMWV)), tent, and generator. The DMS-A section consists of one 25B (74B) supervisor, two 25Bs System Administrator (SA) per DMS-A suite to administer the system, and two 25Bs serving as a DMS-A Subordinate Groupware Servers (SGWS) Contact Team per DMS-A Secret suite to administer the SGWSs at TOCs/Command Posts (CPs).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- DSB

**Reference** (Link et al., 2003):

Link, R., Fujiwara, M., Merchant, D., Foster, M., Moul, T., Hawley, B., & Donnelly, S. (2003). System Evaluation Report (SER) for the Dry Support Bridge (Dsb): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 31208814. DTIC ADB288327.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

130200 - Civil Engineering

Descriptors:

(U) \*MILITARY BRIDGES, DECISION MAKING, OPERATIONAL EFFECTIVENESS, SYSTEMS ANALYSIS, ARMY OPERATIONS, MILITARY TRANSPORTATION

Identifiers:

(U) DSB(DRY SUPPORT BRIDGE)

**System Description:**

The M18 DSB system is a highly mobile, truck mounted, rapidly emplaced, Military Load Classification (MLC) 96 capable, modular/sectionalized bridging system. The bridge is capable of spanning a 40-meter gap and supporting tracked MLC 70 and wheeled MLC 96 normal crossings (tracked MLC 80 and wheeled MLC 100 caution crossings). The bridge set is also capable of supporting the tracked MLC 70-80 and wheeled MLC 96-100 vehicles over two 20-meter spans. The M18 DSB system consists of two subsystems: the M19 DSB and the M1975 Launcher Vehicle.

- a. M1975 Launcher Vehicle (LV). The DSB launch mechanism, along with the system hydraulic crane, are integrated onto a M1075 Palletized Loading System (PLS) truck chassis to create the M1975 LV. The M1975 LV is designed to deploy the M19 DSB within 90 minutes under daylight conditions from the time the first transporter is in place at the crossing site until the bridge is open to traffic. The launcher is capable of retrieving the bridge from either end.
- b. M19 DSB. The M19 Dry Support Bridge is a modular/sectionalized bridge containing sufficient modules to provide one 40-meter bridge or two 20-meter bridges. The bridging components are palletized on seven MID77 flatracks and transported using the M1975 LV and three M1977 Common Bridge Transporter (CBT) trucks towing four M1076 trailers.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- DTS 1.7.0.2

**Reference** (Adamo et al., 2006):

Adamo, L., Edmonds, J. F., & Smith, P. (2006). System Evaluation Report (SER) for the Defense Travel System (DTS) Monroe Release V1.7.0.2: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 60969111 / 2005-LU-C4-DTVLS-A1579. DTIC ADB316137.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER  
Fields and Groups:

120500 - Computer Programming and Software  
150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*DEPARTMENT OF DEFENSE, \*TRAVEL, TEST AND EVALUATION, SURVIVABILITY, DECISION AIDS, SOFTWARE TOOLS, SYSTEMS ANALYSIS, OPERATIONAL EFFECTIVENESS, USER NEEDS

Identifiers:

(U) \*DTS(DEFENSE TRAVEL SYSTEM)

**System Description:**

DTS is a major automated information system for supporting DoD travel requirements and reducing associated costs. DTS provides a web-based single interface for DoD travelers to process their end-to-end travel requirements via a virtual private network. Using DTS, the traveler performs many of the tasks required to plan their own travel, coordinate reservations through their supporting Commercial Travel Office (CTO), prepare their travel authorization and voucher, and submit those documents for approval and reimbursement. DTS is designed to automate and streamline the DoD travel process and integrate the CTO reservation systems and DoD accounting and disbursing systems (DADS) using secure networks and procedures. There are two blocks of software development planned - Block 1 for Temporary Duty Travel (TDY) and Block 2 for Permanent Duty Travel (PDT). The Program Manager (PM) is developing DTS Block 1 in releases of increasing functionality, each named for a U.S. president. Currently, DTS users are using the Madison Release, and a LUT was completed on the Monroe Release. The final Block 1 release will be the Quincy Adams, which is scheduled for release in 2006.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- DTS 1.7.1.5

**Reference** (Adamo, 2007):

Adamo, L. (2007). System Evaluation Report (SER) for the Defense Travel System (DTS) Monroe Release V1.7.1.5: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 60969111 / 2005-LU-C4-DTVLS-A1579. DTIC ADB328641.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

120700 - Computer Systems

150100 - Military Forces and Organizations

Descriptors:

(U) \*DEPARTMENT OF DEFENSE, \*INFORMATION SYSTEMS, \*TRAVEL, TEST AND EVALUATION, SYSTEMS ANALYSIS, RISK ANALYSIS, TECHNOLOGY ASSESSMENT

Identifiers:

(U) \*DTS(DEFENSE TRAVEL SYSTEM), \*SYSTEM ASSESSMENT, \*RR(RESERVATION REFRESH)

**System Description:**

The Defense Travel System is a Major Automated Information System (MAIS) / Acquisition Category (ACAT)-IAM system, currently being developed by the PMO and NGMS to support DoD travel requirements and reduce associated costs for members of all Services and DoD Agencies. DTS provides a web-based single interface for DoD travelers to process their end-to-end travel requirements via a virtual private network. Using the current Monroe Version 1.7.1.4 production system, the DTS traveler performs many of the tasks required to plan their own travel, coordinate reservations through their supporting Commercial Travel Office (CTO), prepare their travel authorization and voucher, and submit those documents for approval and reimbursement. DTS is designed to automate and streamline the DoD travel process and integrate the CTO reservation systems and DoD accounting and disbursing systems (DADS) using secure networks and procedures.

Reservation Refresh. The objective of the Monroe Reservation Refresh release is to provide a user-friendly automated flow controller or wizard capability to the current production system to allow DoD travelers the ability to book real-time reservations when creating initial authorizations. The need for this enhanced capability stems from user feedback that has been substantiated by the Defense Travel Management Office (DTMO) in the following requirement changes provided to PM DTS and NGMS for implementation:

(1) Revised Reservation Module:

\* New reservation wizard.

\* Real-time booking of air, rental car, and lodging reservations.

\* Improves cost estimates by incorporating fees and taxes.

\* Updates Commercial Travel Office/Global Distribution System/Passenger Name Record (CTO/GDS/PNR) Process for reservations and ticketing.

(2) New ITA, Incorporated (ITA) software for flight availability and airfare costs:

\* Combines air availability from all major GDS systems.

\* New tabbed display to separate different types of fares.

\* Automatically defaults to the lowest available fare based on itinerary inputs.

(3) Fixes and enhancements to the following Monroe system functions:

\* Budget Module.

\* Email.

\* Pre-Audits.

\* Pop-Up Messages.

(4) Initial Technical Refresh changes:

\* Installs new SUN X4600 servers to the applications tier to accommodate system growth in usage.

• Converts Reservations code to Java with an Oracle database to begin upgrading to current enterprise technology.

• Incorporates new Reservation software components: Tapestry (for scalable Java web application), Spring (a modular Java/J2EE framework for design and development), and Hibernate (for object-oriented relational database development).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- DTS CBA v.3

**Reference** (Adamo, 2005):

Adamo, L. (2005). System Evaluation Report (SER) for the Defense Travel System (DTS) Centrally Billed Account (CBA) Reconciliation Module Version 3: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 60969111 / 2005-LU-C4-DTVLS-A1579. DTIC ADB315144.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

050100 - Administration and Management

120500 - Computer Programming and Software

Descriptors:

(U) \*DATA BASES, \*ACCOUNTING, \*TRAVEL, \*MODULES(ELECTRONICS), \*SYSTEMS ANALYSIS, TEST AND EVALUATION, VOLUME, PERFORMANCE(ENGINEERING), TIMELINESS, HUMAN FACTORS ENGINEERING, FEEDBACK, SURVEYS, OPERATIONAL EFFECTIVENESS, COMMUNICATIONS TRAFFIC, DEPARTMENT OF DEFENSE, COMPUTER PROGRAMS

Identifiers:

(U) \*DEFENSE TRAVEL SYSTEM, \*RECONCILIATION MODULE, \*BILLING, DTS(DEFENSE TRAVEL SYSTEM), RECONCILIATION, INVOICES, TRANSACTIONS, CBA(CENTRALLY BILLED ACCOUNT)

**System Description:**

The CBA Reconciliation module provides an organization with the ability to electronically receive, reconcile, and certify invoices for payment from the CCV and perform related administrative functions.

(1) Automated Reconciliation. The CBA module performs automatic reconciliation of invoices by identifying matched and unmatched transaction records within 24 hours after receipt of the invoice from the CCV, also known as Bank of America. The CBA Reconciliation module compares the transactions on the CCV invoice to the travel records contained within DTS. DTS identifies each transaction as being matched or unmatched by comparing key database fields (ticket number, ticket amount, traveler last name, and travel date). Once the CBA transactions are automatically reconciled, the Transportation Officer (TO) receives an email that the autoreconciled data are ready for review. The TO then reviews the data and conducts any required follow-up activities before certifying the invoice by digitally signing the document-

(2) Manual Reconciliation. The CBA Reconciliation module provides the TO the capability to manually reconcile unmatched transactions, classify transaction types, change the invoice transaction status, and support the correction of unmatched transactions. Transactions must be reconciled manually by the TO if they are not auto-reconciled by the CBA module. The TO must investigate unmatched transactions using data provided by DTS and then resolve unmatched transactions through one or more of the following: manually reconciling the invoice line item by Trip Authorization Number (TANLTM) or ticket number, informing the Authorizing Official (AO) via e-mail to create an amendment based upon justification provided by the TO, or disputing the transaction back to the CCV. A feature added in April 2005 allows the TO to place unmatched transactions into a Held status if corrections cannot be completed by the end of the 30-day PPA period. This allows the TO to certify all other matched transactions within the PPA period to avoid interest penalties. Once corrective action has been finalized, the TO can move transactions out of the Held status, manually match them to DTS trip records, then create an interim invoice for certification and payment.

(3) Invoice Certification. Once all transactions are matched, disputed, or held, the TO can review and certify the CBA invoice for payment by digitally signing the document. DTS will send the certified invoice

to the vendor payment system, where the invoice is validated for accuracy before being forwarded to the appropriate disbursing system. Once the disbursing system releases the electronic funds transfer (EFT) payment, an advice of payment message is sent to DTS, where it is then archived for 6 years and 3 months. This same process occurs for interim invoices created and certified by the TO for held transactions that are matched.

(4) Administration. The CBA module allows the TO to compile compliance reports that track the efficiency of the invoice processing time from invoice receipt through TO certification to actual payment. The TO can search reports that provide data relative to specific invoices. The Defense Travel Administrator (DTA) can add, edit, or deactivate CBA, assign or revoke CBA TOs, assign default accounts to an organization, assign and edit an organization account label, and activate CBA for reconciliation. The Project Management Office (PMO) Operations Division administers all CBA site accounts. The PMO can grant or revoke access for CBA users, generate compliance reports, and restage CBA invoices if the CCV invoice is not created and auto-reconciled in DTS.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- DTS Madison

**Reference** (Adamo, 2005):

Adamo, L. (2005). System Evaluation Report (SER) for the Defense Travel System (DTS) Madison Release: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 51878012 / 2005-LU-C4-DTVLS-A1504. DTIC ADB313848

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

120500 - Computer Programming and Software

150300 - Defense Systems

Descriptors:

(U) \*COMPUTER PROGRAMS, \*DEPARTMENT OF DEFENSE, \*TRAVEL, DEFENSE SYSTEMS, SITES, AUDITING, RECORDS, FEEDBACK, MISSIONS, RELEASE

**System Description:**

DTS is a major automated information system for supporting DoD travel requirements and reducing associated costs. DTS provides a web-based single interface for DoD travelers to process their end-to-end travel requirements via a virtual private network. Using DTS, the traveler performs many of the tasks required to plan their own travel, coordinate reservations through their supporting Commercial Travel Office (CTO), prepare their travel authorization and voucher, and submit those documents for approval and reimbursement. DTS is designed to automate and streamline the DoD travel process and integrate the CTO reservation systems and DoD accounting and disbursing systems (DADS) using secure networks and procedures. There are two blocks of software development planned - Block 1 for Temporary Duty travel and Block 2 for Permanent Duty travel. The DTS Program Manager (PM) is developing DTS Block 1 in releases of increasing functionality, each named after a U.S. President. At the present time, the Madison release has been fielded, and the Monroe release is undergoing an LUT at Fort Hood, TX. The final Block 1 release will be Quincy Adams and is scheduled for release in 2006.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

**System Short Name:** SER- DTS Madison 1.6a

**Reference** (Nicholas et al., 2005):

Nicholas, K., Edmonds, J. F., & Goss, K. K. (2005). System Evaluation Report (SER) for the Defense Travel System (DTS) Madison Release a (V.1.6a): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 51878012 / 2005-LU-C4-DTVLS-A1504. DTIC ADB309617.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

050100 - Administration and Management

Descriptors:

(U) \*OPERATIONAL EFFECTIVENESS, \*TRAVEL, \*JOINT TEST AND EVALUATION, INTEGRATED SYSTEMS, ACCOUNTING, SURVIVABILITY, INTERNET BROWSERS, INFORMATION SECURITY

Identifiers:

(U) \*DTS(DEFENSE TRAVEL SYSTEM), EXPORT CONTROL, SER(SYSTEM EVALUATION REPORT)

**System Description:**

DTS integrates commercial travel reservation systems and DoD accounting and disbursing systems (DADS) via a virtual private network (VPN) to give the traveler a single interface to an end-to-end travel process. This process begins with the user accessing the DTS via a web portal to create and digitally sign a travel request. These requests are made to various commercial reservation systems and include real-time transportation, lodging, and rental car availability. The user-generated travel authorization contains a "should cost" estimate of the trip. Once completed, the approving officials receive the authorizations via designated routing lists. The DTS enforces compliance with DoD travel policies using audit alerts.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ECDS

**Reference** (Comer, 2006):

Comer, D. (2006). System Evaluation Report (SER) for the Enhanced Containerized Delivery System (ECDS) / Abbreviated (ASER): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB320156.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

010200 - Military Aircraft Operations

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*SHIPPING CONTAINERS, \*AERIAL DELIVERY, TEST AND EVALUATION, CARGO PARACHUTES, PAYLOAD, OPERATIONAL EFFECTIVENESS

Identifiers:

(U) ECDS(ENHANCED CONTAINERIZED DELIVERY SYSTEM)

**System Description:**

The ECDS consists of three major components. The primary component is the 88- by 108-inch aircraft-grade aluminum cargo platform with four suspension points and multiple restraint points. The second

component is the recovery system of clustered G-12D parachutes. The third component is the cargo restraint net. Together these three components comprise a means of addressing logistical re-supply needs. The ECDS is capable of being fork-lifted, sling-loaded by crane or helicopter, and is compatible with aircraft cargo and logistics rail and lock systems on both C-130 and C-17 cargo aircraft. The ECDS will be reusable 12 times (threshold).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ENVG

**Reference** (Nellans, 2005):

Nellans, T. (2005). System Evaluation Report (SER) for the Enhanced Night Vision Goggle (ENVG) / Abbreviated (ASER): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report # 50747969.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

**System Description:**

The ENVG system will be a modular, helmet-mounted, passive, electro-optical night vision device. The system will integrate image intensification (I2 ) and infrared (IR) sensing capabilities. The IR sensor provides the Soldier with the capability to rapidly detect and recognize human-sized targets, while the I2 sensors provides the Soldier the capability to see detail and to use rifle-mounted aiming lights. The ENVG will incorporate an IR-emitting light source that provides illumination for close-up viewing, when required. The ENVG uses a standard NVG helmet mount to attach the monocular to the helmet, and a strap across the helmet top to attach the battery pack. The system will mount on present and future Soldier equipment, including the Advanced Combat Helmet, using standardized brackets. Program technical risk is minimal because of the integration of present, known imaging capabilities. Future program goals include Thermal Weapon Sight (AN/PAS-I3) and Land Warrior (LW) compatibility.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- ENVG

**Reference** (Farquhar et al., 2007):

Farquhar, J. G., Goodman, M. A., Rambo, P. G., Beran, G. B., Bindel, S. R., Lloyd, T. M., Fye, L. K., Richardson, P. O., Colbert, J. C., Sutsko, A. J., David R. Musser, S., & Bonnet, C. C. (2007). System Evaluation Report (SER) for the (Provided as Input to Support a Milestone C Decision) Enhanced Night Vision Goggle (ENVG) AN/Psq-20 (ACAT III): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 72979998.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

**System Description:**

The ENVG system is a modular, helmet-mounted, passive, electro-optical night vision device. The system integrates Image Intensification (I<sup>2</sup>) and infrared (IR) sensing capabilities. The IR sensor provides the Soldier with the capability to rapidly detect and recognize human-sized targets, while the I<sup>2</sup> sensor provides the Soldier the capability to see detail and to use rifle-mounted aiming lights. The ENVG incorporates an IR-emitting light source that provides illumination for close-up viewing, when required. The ENVG uses a helmet mount to attach the monocular to the front of the helmet. The battery pack attaches to the back of the helmet.

System Components.

- a. Image Intensifier (I<sup>2</sup>) Channel.** The I<sup>2</sup> is controlled by the on-off variable gain Control Knob. The I<sup>2</sup> channel provides a high-resolution view of the environment that appears green to the user. The channel, through the I<sup>2</sup> objective lens, collects light reflected from the night scene by the moon, stars, or other sources and focuses that image on the I<sup>2</sup>. The I<sup>2</sup> converts the captured light into a visible image that is relayed through the beam combiner and viewed through the eyepiece lens.
- b. Thermal Channel.** The thermal channel is controlled by the On-Off Liquid Crystal Display (LCD) Brightness Polarity Knob. The thermal channel objective lens collects thermal energy from a heat source and focuses the energy to a thermal detector. The thermal detector converts the energy to an analog signal. The analog signal is converted to a digital signal through a circuit card assembly set and input into the LCD. This image is relayed through the beam combiner and viewed through the eyepiece lens.
- c. Near Infrared (IR) Illuminator.** The IR Illuminator is controlled by a lever-switch. The lever also provides a momentary push on, release capability. When the IR illuminator is active, a continuous red Light Emitting Diode (LED) will be visible through the eyepiece just outside the 40-degree image tube active area. The IR can be used to signal, enable map reading, and illuminate darkened areas when ambient light is not sufficient.
- d. I<sup>2</sup> Objective Focus.** Rotates the objective lens to focus the imaging system. The focus stops allow adjustment from approximately 10 inches through infinity.
- e. Eyepiece Diopter Adjustment.** Rotates the eyepiece to adjust the diopter to focus the display image to the user's eye. The eyepiece has a usable diopter adjustment from approximately +2 to -4 diopters.
- f. High Light Cut-Off.** The I<sup>2</sup> channel will automatically cut off after 70 ± 30 seconds of operation in daylight or bright room light (illumination intensity must exceed 100 Foot Candle (FC)+ 100/-50 FC at the image intensifier objective).
- g. Controls.** The Imaging System has embedded switches and knobs for selecting the IR Mode, Overlay Mode, Outline Mode, Full Thermal Mode, Full I<sup>2</sup> Mode, Black-Hot to WhiteHot, and a manual calibration capability.
- h. Liquid Crystal Display (LCD).** The LCD is the user interface for viewing all setup functions and thermal images.
- i. Battery Pack.** The battery compartment is designed to hold four commercially-available L91 lithium manganese dioxide 1.5-volt batteries.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Explosives- Bangalore BTDK

**Reference** (Lee, 2005):

Lee, C.-L. C. (2005). System Evaluation Report (SER) for the Milestone C, Type Classification-Standard (TC-STD) Decision of the 2.5-Foot Bangalore Torpedo (BTDK) / Abbreviated (ASER): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. report # 50967981.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

**System Description:**

The current M1A2 Bangalore system consists of ten 5-foot long steel torpedoes or tubes, each filled with a Composition B-4 main charge and a Composition A-3 booster at each end. Sections are joined end-to-end by short cylindrical connectors or sleeves to provide the desired length for obstacle clearing. A rounded nose sleeve, to facilitate pushing assembled tubes through obstacles, is secured to the lead tube by a clip. After pushing one or more assembled tubes beneath the obstacle, the obstacle is defeated by detonating the tubes using a blasting cap or any current initiating system. The only difference between the M1A2 and the 2.5' BT is tube length. The 2.5' BT will contain 2.5-foot-long tubes, each with approximately 4.6 pounds of Composition B-4. All other tube material, tube diameter and thickness, explosive, connecting sleeves, priming, pushing, and initiation remain unchanged from the current M1A2; hence, Soldier tasks for employment remain unchanged.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Explosives- Blasting Cap- M16

**Reference** (ATEC, 2001):

ATEC. (2001). System Evaluation Report (SER) for the M16 Blasting Cap: U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB266608.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

150500 - Logistics, Military Facilities and Supplies

190100 - Ammunition and Explosives

Descriptors:

(U) \*DETONATORS, \*EXPLOSIVES INITIATORS, TEST AND EVALUATION, MATERIEL, ARMY EQUIPMENT, RELEASE, SYSTEMS ANALYSIS, TACTICAL WEAPONS, SHOCK TUBES

Identifiers:

(U) ARMY REGULATION 73-1, \*M-16 BLASTING CAPS, MDI (MODERNIZED DEMOLITION INITIATORS)

**System Description:**

M16 Blasting Cap.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Explosives- HE-WAM

**Reference** (Fendick et al., 2000):

Fendick, K., White, D., Laughman, R., & Hawley, B. (2000). System Evaluation Report (SER) for the Materiel Release of the Hand Emplaced - Wide Area Munition (HE-WAM) (U): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. AEC, Alexandria, VA. OTC Report # 03558348. DTIC ADC064708.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

150606 - Land Mine Warfare

190100 - Ammunition and Explosives

Descriptors:

(U) \*ARMY RESEARCH, \*MINEFIELDS, \*OPERATIONAL EFFECTIVENESS, \*AMMUNITION, TEST AND EVALUATION, WEAPONS, OUTPUT, SIMULATION, SOURCES, MATERIEL, DECISION MAKING, SURVIVABILITY, MODELS, ARMY EQUIPMENT, RELEASE, SYSTEMS ANALYSIS

Declassification:

OADR

Identifiers:

(U) EXPORT CONTROL, HE WAM(HAND EMPLACED WIDE AREA MUNITION)

**System Description:**

**The Basic HE-WAM, XM93**, an integral part of the family of Wide Area Munitions, is a first generation, intelligent munition designed to autonomously search, detect, classify and destroy enemy tracked armor vehicles at a stand off distance of up to 100 meters. Stored and delivered in a PA160 Shipping and Storage Container, this one-man portable, cylindrical, 35 pound munition is designed to be set in either the Manual Mode or the Remote Mode. The Control, Remote, Land Munition System: M71 [M71 Remote Control Unit (RCU)] is used to send remote arm and destruct commands to WAMs previously encoded with that M71. After arming, the HE-WAM is designed to remain in a munitionfield and engage target vehicles through means of an electronic sensor suite that seismically detects a vehicle, acoustically measures the signature of a vehicle up to 240 meters away, classifies the signature up to 180 meters away, and, if the signature is classified as a "go", fires a sublet at the projected closest point of approach. The sublet contains an infrared sensor for top attack using an Explosively Formed Penetrator (EFP) warhead. Examples of target vehicles include but are not limited to: enemy tanks (T-80 and T-72), lightly armored vehicles (BMP), and enemy breachers (KMT 4, KMT 5, and IMR) .

**b. The Basic HE-WAM Individual Training Device, XM98.**

(1) The XM98 is a totally inert, reusable training device with the same physical dimensions and shape as the XM93, and capable of withstanding 1855 uses over a life of 5 years. The control panel is identical to the XM93 and simulates all the functions of the XM93. The legs of the XM98 are individually deployable and an instructor feedback panel (visible when the legs are deployed) provides the instructor with feedback that indicates whether the operator correctly performed the arming sequence. The XM98 is capable of receiving radio signals from the M71 RCU.

(2) A simulator battery pack is used in lieu of the XM93's active battery pack. The main power for the XM98 is provided by four lithium D-cell batteries in the munition base. The training munition is marked with a blue stripe to distinguish it from the live-loaded munition. There is a warning label engraved on the bottom of the XM98 (the hermetically sealed cover for the D-cell battery compartment) warning the maintainer personnel about the potential dangers of incorrectly installing the lithium D-cells.

**c. The Collective Training Device, XM97**, is a totally inert training device which will be used to train personnel in a "Force-on-Force" environment on all operations required to properly deploy, emplace, and arm the XM93 tactical WAM. All switches, levers, knobs, buttons, handles, etc. which are required for setting, interfacing with the M71 RCU, arming, and deploying the tactical WAM are present and mechanically operational, and resettable. The XM97 does not utilize any electronics and there are no lights because electrical functionality and feedback are not required for collective training. All of the exterrral colors, dimensions, weight, center of gravity, and materials of the controls are representative of, but not identical to, the materials and controls on the XM93.

**Report Availability:**

Secret/NoForN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Explosives- IMS- FCS

**Reference** (Tilghman et al., 2005):

Tilghman, J. P., MacFarlane, K., Hilliker, C., Catalano, E., Harley, K., Cassidy, R., Robinson, J., & Tovar, G. (2005). System Evaluation Report (SER) for the Intelligent Munition System (IMS) Increment 1 Milestone B: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 53358063. DTIC ADB314024.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*AMMUNITION, REQUIREMENTS, SYSTEMS ANALYSIS, POLICIES

Identifiers:

(U) SER(SYSTEM EVALUATION REPORT), IMS(INTELLIGENT MUNITION SYSTEM), FCS(FUTURE COMBAT SYSTEMS), ORD(OPERATIONAL REQUIREMENTS DOCUMENT), TRADOC(TRAINING AND DOCTRINE COMMAND)

**System Description:**

The proposed IMS munition field will consist of lethal and/or non-lethal engagement effects devices, situational awareness (SA) components, command control, and communication components. The IMS Increment 1 will be monitored and controlled by the IMS Control Station. The IMS Increment 1 field may be augmented by Spider Munition Control Units (MCUs). The IMS field components are discussed below.

**1. Situational Awareness (SA) Components.** IMS SA sensors will be employed beyond the IMS engagement area to provide advanced warning and threat assessment. The sensors provide targeting data to the controlling component within the IMS field to improve the performance of the engagement munitions.

**2. Command, Control, and Communications Components.** The full capability of the IMS is dependent on the communications that link the sensors, munitions, and command and control elements of the system. Detections will be reported in near-real-time, and command and control instructions will be transmitted as directed by the commander. A key element that differentiates IMS from other engagement systems is the software built into the system components that permit autonomous or semi-autonomous operations in accordance with the commander's intent and rules of engagement. The system may be programmed to engage only selected targets or to only detect, identify, and report. The commander can decide in advance how the Th1S is to function (based on how the battle is fought) and modify instructions as the situation dictates. Munitions may be disarmed to permit the passage of friendly forces and then rearmed, all while reporting their locations and status. The Th1S thus can function on the battlefield in a manner analogous to a combat unit under the command and control of the senior commander in support of offensive operations. The software permits the IMS to perform as sentries, a reconnaissance and security unit, a combat outpost, a reaction or counterattack force, an ambush force, or a combat patrol.

**3. Engagement Munitions.** The lethal AT/AV/AP munition is a multi-mode and can defeat vehicles ranging from light-wheeled to track as well as personnel. The munition consists of two major subassemblies: Platform Assembly and Sensor-Fuzed Kill Munition (SFKM). The Platform Assembly provides self-righting, cover release, short-haul communications, control, geo-location, intrusion sensing, propulsion system, storage and protection of the SFKM, power source, and operator controls. The SFKM provides dual mode active/passive infrared sensing to detect target, cone motion generation, and lethal mechanism function.

**4. Dispensing Module.** The IMS Dispensing Module (DM) is a two-man portable container for all Th1S munitions field components. It will be hand emplaced and its components will be command dispensed to provide a 3S-meter diameter munitions field. The DM can also be opened so that the munitions and sensors can be hand emplaced.

**5. IMS Engagement Timeline.** The IMS engagement sequence of events in order:

1. Target approaches obstacle.
2. Situational awareness sensors detect target.
3. SA determine track for target.
4. Munition launches when IMS determines target is within range.
5. Munition searches for target.
6. Munition detects target.
7. Munition fires on and destroys target.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Explosives- MCCM

**Reference** (Romanko et al., 1998):

Romanko, T., Tiamey, R., & Abeyta, R. (1998). System Evaluation Report (SER) for the Modular Crowd Control Munition (MCCM): U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 83347030 / SER 10-98. DTIC ADB239833.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*PROJECTILES, \*AMMUNITION, MODULAR CONSTRUCTION, RUBBER, EXPLOSIVES, STEEL, REPLACEMENT, SYSTEMS ANALYSIS, NONLETHAL AGENTS, PERSONNEL DETECTORS

Identifiers:

(U) MCCM(MODULAR CROWD CONTROL MUNITION)

**System Description:**

The MCCM is similar, in outward appearance, to the M18AI Claymore mine. The explosive consists of either 12.5 grams of PETN-based DETA sheet, or 14 grams of 10-grain PRIMACORD. The outer housing consists of a front cover with metal legs for ground emplacement and a rear cover with unobtrusive markings and tactile identifiers to differentiate the MCCM from the M18AI. The front cover will be scored to ensure cover fragments do not produce potentially lethal effects. The nonlethal mechanism consists of 600 polyvinyl chloride (PVC) balls (.32 caliber) packed in two layers against the inside of the front cover and supported from behind by the sheet explosive and foam packing to prevent shifting. The initiation of the MCCM is by means of an M7 blasting cap to be used with the modernized demolition initiation (MDI) shock tube and M81 igniter. The munition can also be initiated by an M6 electric blasting cap. Both the sight/aiming device and blasting cap well in the top of the front cover are identical to the Claymore. The relatively uniform distribution of 0.4 gram projectiles travel outward from the munition in a 45-60 degree horizontal arc at an initial velocity of approximately 100 mps with a fairly narrow vertical spread angle of about 10 degrees.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Explosives- MCCM

**Reference** (Streilein, 1999):

Streilein, J. J. (1999). System Evaluation Report (SER) for the Milestone III of the Modular Crowd Control Munition (MCCM): U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 91628055. DTIC ADB244705.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*ANTIPERSONNEL MINES, \*RIOT CONTROL, \*NONLETHAL WEAPONS, DAMAGE ASSESSMENT, DETONATORS, DETONATING CORD

**System Description:**

The MCCM is similar, in outward appearance, to the M18A1 Claymore mine. The explosive consists of 12.5 grams of PETN based DETA sheet. The outer housing consists of a front cover, a side/perimeter housing with folding metal legs for ground emplacement, and a rear cover with coloring/markings and tactile identifiers to differentiate the MCCM from the M18A1. The front cover is intended to be scored to preclude large fragments which might produce potentially lethal effects. The nonlethal mechanism consists of 600 polyvinyl chloride (PVC) balls (.32 caliber) packed in two layers against the inside of the front cover and supported from behind by the sheet explosive and foam packing to prevent shifting. The initiation of the MCCM is by means of an M7 blasting cap used with the modernized demolition initiation (MDI) shock tube and M81 igniter. The munition can also be initiated by an M6 electric blasting cap or det-cord with various blasting caps. The entire distribution of 0.4 gram projectiles is spread over 100-120 degree horizontal arc at an initial velocity of approximately 150 mps with a vertical spread angle of about 70 degrees. Approximately half of the 600 sting balls are projected outward in a 50-60 degree horizontal arc, with a vertical spread of about 20 degrees. Except for a lighter weight, all physical measurements as well as emplacement legs, sight/aiming device, and blasting cap well in the top of the front cover are identical to the M18A1 Claymore.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Explosives- MDI

**Reference** (Grady and Abeyta, 2000):

Grady, E., & Abeyta, R. (2000). System Evaluation Report (SER) for the Modernized Demolition Initiators (MDI) XM151, XM152 Boosters and XM152 Inert Booster Milestone III: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 00568207 / NA. DTIC ADB251439.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*DEMOLITION, \*SYSTEMS ANALYSIS, \*EXPLOSIVES INITIATORS, REQUIREMENTS, DECISION MAKING, DEFENSE SYSTEMS, PRODUCTION, SURVIVABILITY, DOCUMENTS, CLASSIFICATION, PERSONNEL, QUALITY ASSURANCE, REGULATIONS

Identifiers:

(U) EXPORT CONTROL

**System Description:**

1. The XM151 and XM152 Demolition Booster Assemblies and the XM152 Inert Demolition Booster Assembly are to be added to the MDI family of demolition initiators. The MDI family of initiators are commercially available items currently used in the mining industry. The initial set of items were shock-tube based with a low-strength blasting cap on the end. Army Regulation (AR) 385-63 prohibits the burying of cap-primed charges and prepriming of charges with blasting caps.

2. The XM151 and XM152 Demolition Booster Assemblies are no-delay, nonelectric insensitive initiation systems. The XM151 is a 10-foot-long, solid detonating cord and the XM152 is a 30-foot-long, solid detonating cord. A secondary explosive booster is precrimped at one end of the XM151 and XM152. The XM151 and XM152 detonating cords have a high velocity detonation rate equivalent to the standard military detonating cords (type I/type II). The XM151 and XM152 Boosters contain no primary explosive; they have only secondary explosive. This allows the booster to be buried and be preprimed into demolitions. The XM152 Inert Booster is completely inert, labeled inert, has holes drilled through the booster, and is bronze in color.

3. The initiation output of the XM151/XM152 Boosters is equivalent to that of the number 12 commercial blasting cap. The XM151/XM152 Boosters have no initiation delay which makes them well suited for situations requiring simultaneous initiation and detonation. The XM151/XM152 Boosters have explosive sensitivity comparable to the detonating cords to allow for usage that involves booster burial and prepriming of the explosive charges.

4. The XM152 inert trainer for the XM151/XM152 Boosters is bronze in color (the tactical boosters will be dull, nonreflective, and black) and has the same physical dimensions as the live components. Inert trainers have a see-through hole in the booster assemblies to indicate that they are inert. The inert trainers do not contain any pyrotechnic or explosive components.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Explosives- MDI

**Reference** (Grady, 2001):

Grady, E. (2001). System Evaluation Report (SER) for the Modernized Demolition Initiator (MDI), M18: U.S. Army Evaluation Center (AEC), Aberdeen Proving Ground, MD. Report #: 11148443. DTIC ADB265691.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*EXPLOSIVES INITIATORS, ACCEPTANCE TESTS, MANUFACTURING, RISK, DEMOLITION, ARMY EQUIPMENT, SYSTEMS ANALYSIS, BLAST, RADIO TRANSMITTERS, ELECTRICAL EQUIPMENT, ACCIDENTS, DETONATORS, DETONATING CORD

Identifiers:

(U) \*M-18 EXPLOSIVE INITIATORS, M-7 DETONATORS, M-6 DETONATORS

**System Description:**

General. MDI is a new family of nonelectric blasting caps and associated items. MDI supplements and partially replaces the M7 nonelectric blasting cap, the M6 electric blasting cap, and the detonating cord. The snap-together MDI components simplify initiation systems and some types of existing priming. Complete replacement of electrical initiation systems will result in no requirement for blasting machines and associated demolition equipment, thus greatly reducing the risk of accidental initiation by radio transmitters in the area or by electricity discharge. The M18 consists of an M7 nonelectric blasting cap factory-crimped to a factory-calibrated 20 minute length of M700 time blasting fuse. It is a standardized delay initiator for shock tube blasting cap priming systems. Yellow bands on the exterior of the M700 fuse indicate calibrated 1-minute time intervals. Note: Bum time will increase with altitude and colder temperatures.

Operational Use. The MDI will be used for general demolition tasks performed by engineers, infantry, armor and armored cavalry, field artillery, special forces, ordnance and explosive disposal personnel. Engineer squads and other combat arms companies that have demolition missions will convert solely to

MDI. Special operation forces and explosive ordnance disposal (EOD) units will augment their current systems with the MDI. The M18 MDI 1-2 will be used to initiate systems to rapidly clear unexploded ordnance (UXO) in small areas that can accept detonation in place. The MDI may be used for mobility, counter-mobility, survivability, and sustainment missions that include, but are not limited to, hasty road craters, deliberate road craters, concrete and steel bridge demolition, abatis, antitank ditches, quarrying, underwater demolition, denial operations, EOD, and M18A1 Claymore mine initiation. The MDI will be operated and stored in hot, cold, and basic climate environmental types in accordance with Army Regulation 70-38. The MDI will be used underwater and by soldiers wearing the full range of environmental protective clothing to include Mission-Oriented Protective Posture Level IV with load-carrying equipment (excluding arctic mittens)

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Explosives- MDI

**Reference** (Grady, 2002):

Grady, E. (2002). System Evaluation Report (SER) for the XM19/21/23 Modernized Demolition Initiators (MDI) Milestone C Production Decision: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 22818727. DTIC ADB283497.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*ACCEPTANCE TESTS, \*EXPLOSIVES INITIATORS, TEST AND EVALUATION, LOW TEMPERATURE, DECISION MAKING, VERIFICATION, HIGH TEMPERATURE, DEMOLITION, HUMAN FACTORS ENGINEERING, THERMAL SHOCK

Identifiers:

(U) \*MODERN DEMOLITION INITIATORS

**System Description:**

MDI modernizes an entire set of items for the initiation of a range of explosives and demolition munitions. The two major items in use today are the non-electric and the electric firing systems. The non-electric systems consist of a fuse igniter, time fuse, detonating cord, and a blasting cap. The electrical system consists of a generator type machine, reels of signal wire, and a blasting cap.

The MDI program will replace these initiation systems for most missions with a nonelectric system employing "shock tube" technology to transmit the initiating signal. The shock tube consists of a small-diameter plastic tube with a very fine layer of energetic material (HMX) deposited on the inner wall. The shock wave is totally contained within the plastic tube. Shock tube initiating products have been in wide use by the mining and excavating industries for 20 years. In addition, the military forces have used some MDI components in the field in recent years. The differences between the regular shock tube M121M13 and the new mini-tubes (XM19, XM21, and XM23) are:

- Regular shock tube has a larger diameter tube (0.118 inch versus 0.090 inch).
- Regular shock tube has a sealed end while the mini-tube has an inline M42 primer with an M81 Firing Mechanism attached.
- Regular shock tube has a number 8 commercial cap while the mini-tube has a military cap equivalent to a number 12 commercial cap.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Explosives- MDI Booster

**Reference** (Grady, 2001):

Grady, E. (2001). System Evaluation Report (SER) for the Modernized Demolition Initiators (MDI) M151 & M152 Boosters and M152 Inert Boosters: U.S. Army Evaluation Center (AEC), Aberdeen Proving Ground, MD. Report #: 12118534. DTIC ADB268840.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*DEMOLITION, \*EXPLOSIVES INITIATORS, TEST AND EVALUATION, ACCEPTANCE TESTS, PRODUCTION, RELEASE, USER NEEDS, SYSTEMS ANALYSIS, BOOSTERS(EXPLOSIVES)

Identifiers:

(U) M-151 INITIATORS, M-152 INITIATORS

**System Description:**

1. The M151 and M152 Demolition Booster Assemblies and the M152 Inert Demolition Booster Assembly are to be added to the MDI family of demolition initiators. The MDI family of initiators are commercially available items currently used in the mining industry. The initial set of items were shock-tube based with a low-strength blasting cap on the end.
2. The M151 and M152 Demolition Booster Assemblies are no-delay, nonelectric insensitive initiation systems. The M151 is a 10-foot-long, solid detonating cord and the M152 is a 30-foot-long, solid detonating cord. Precrimped at one end of the booster assemblies is a secondary 1-2 explosive booster that has a length of 2.25 to 2.35 inches and an outside diameter of 0.230 to 0.241 inch and consists of 0.8 gram of PETN. The detonating cord has 5 grains of PETN per foot and has a maximum outside diameter of 0.09 inch. The M151/M152 detonating cords have a high velocity detonation rate equivalent to the standard type and type II military detonating cords. They have no initiation delay which makes them well suited for situations requiring simultaneous initiation and detonation. The boosters contain no primary explosive; they have only secondary explosive. This allows the booster to be buried and be preprimed into demolitions.
3. The M152 inert trainer is bronze in color (the tactical boosters will be dull, nonreflective, and black) and has the same physical dimensions as the live components. Inert trainers have a see-through hole in the booster assemblies to indicate that they are inert. The inert trainers do not contain any pyrotechnic or explosive components.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Explosives- RAMS

**Reference** (Grady and White, 1999):

Grady, E., & White, D. (1999). System Assessment (SA) for the Remote Activation Munition System (RAMS) (Material Release): U.S. Army Operational Test and Evaluation Command, Park Ctr. IV, Alexandria, VA 22302-1458. DTIC ADB243468.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)  
Fields and Groups:

120500 - Computer Programming and Software

190100 - Ammunition and Explosives

Descriptors:

(U) \*AMMUNITION, \*REMOTE SYSTEMS, TEST AND EVALUATION, ACTIVATION,  
MANUFACTURING, DECISION MAKING, SURVIVABILITY, RELEASE, SYSTEMS ANALYSIS

Identifiers:

(U) ORD(OPERATIONAL REQUIREMENTS DOCUMENT)

**System Description:**

The RAMS provides the capability to remotely control the detonation of demolition charges or the remote operation of other items of equipment, such as beacons, laser marker, radio functioning munitions, etc. The RAMS will initially consist of four components: the M26 transmitter, the M6 auxiliary power pack (APP) for the transmitter, the M16 receiver, and the M1 flashlight. The system will have a nominal range of 2 km line of sight (LOS) over dry sand and 5 km LOS over dry sand with the APP. Each of the RAMS components will individually fit in the shirt breast pocket of the present battledress uniform (BDU). The RAMS will be operated and maintained by the same personnel that presently operate and maintain the M122 Demolition Firing Device. The RAMS (the transmitter, the M16 receiver, and the APP) uses 9-volt batteries. The M16 receiver will be maintained as a Class VII item. Initial operational capability will be the 30 systems (1 system/PAWS container) per ranger regiment. Full operational capability is planned to be 100 systems per Special Operations Forces (SOF) group. The XM17 (used to initiate nonelectric blasting caps and is disposable) and XM18 receivers (capable of producing a mechanical output (push/pull) will be added at a later date. Comparisons may be made throughout this System Evaluation Report of the RAMS requirements to the capabilities/characteristics of the M122 Demolition Firing Device, an existing system in the Army inventory.

**M26 Transmitter.** The M26 transmitter shall be capable of programming and remotely activating any of the present and future receiver types. The RAMS transmitter has four unique and three common transmission codes. Normal LOS transmitting range shall be 2 km over dry sand with the capability for extended range of up to 5 km over dry sand when the M6 is used. The M26 must have the capability of simultaneously firing any number of RAMS receivers within range or sequential firing of at least four groups of receivers. The M26 must have an interface to provide the capability of being remotely functioned by the RAMS M16 receiver, which will provide a relay capability.

**M6 APP.** The M6 APP shall use the same batteries as the transmitter and receivers and provide the necessary power to meet the extended operating range of 5 km over dry sand when connected to the transmitter.

**M16 Receiver.** The M16 receiver shall be reusable and will be capable of detonating up to four M6 electric blasting caps at a 100-foot range from the receiver when using WD-1 field wire. This receiver will be capable of simultaneously firing up to four series-connected electric blasting caps, when remotely commanded by the transmitter. The M16 receiver will have the same output characteristics as the M122.

**M1 Flashlight.** The M1 Flashlight is a commercial off-the-shelf, full spectrum, lowlevel light source with reduced infrared signature. Its purpose is to provide the SOF soldiers with a flashlight during nighttime missions with the RAMS as well as other systems.

**Packaging.** The RAMS components, one M16 transmitter, one M6 battery retainer, two antennas, six receivers, one flashlight, ten battery connector boards, and two antennas are packed in a PA 108 container, a commonly used shipping container. Additional receivers will be packed nine to a PA 108 container.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

**System Short Name:** SER- Explosives- RAMS

**Reference** (Grady and White, 2001):

Grady, E., & White, D. (2001). System Evaluation Report (SER) for the Remote Activation Munition System (RAMS) XM17 Receiver Milestone III: U.S. Army Evaluation Center (AEC), Aberdeen Proving Ground, MD. Report #: 10518383. DTIC ADB263812.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190900 - Explosions

250200 - Radio Communications

Descriptors:

(U) \*RADIO RECEIVERS, \*REMOTE CONTROL, TEST AND EVALUATION, ACTIVATION, DEMOLITION, ORDNANCE, DETONATIONS

Identifiers:

(U) RAMS(REMOTE ACTIVATION MUNITION SYSTEM), TACTICAL RECEIVERS

**System Description:**

The RAMS provides the capability to remotely control the detonation of demolition charges or the remote operation of other items of equipment, such as beacons, laser marker, radio functioning munitions, etc.

The four basic components of the RAMS are the M26 receiver (with antenna), the M6 auxiliary power pack (APP) for the transmitter, the M16 receiver (with antenna), and the M1 flashlight. The XM17 receiver is a single shot receiver which shall be capable of detonating an M7 non-electric blasting cap. This evaluation focused on the XM17 receiver. The system has a nominal range of 2 km line of sight (LOS) over dry sand and 5 km LOS over dry sand with the APP. Each of the RAMS components individually fits in the shirt breast pocket of the present battledress uniform. The RAMS will be operated and maintained by the same personnel that presently operate and maintain the M122 Demolition Firing Device. The RAMS (the transmitter, the M16 receiver, and the APP) uses 9-volt batteries. The M16 receiver will be maintained as a Class VII item. The XM17 receiver is used to initiate non-electric blasting caps (M7) and is disposable. The XM18 receiver, capable of producing a mechanical output (push/pull), will be added at a later date. The RAMS is being developed by the U.S. Army Research Laboratory (ARL) and will be produced by Raytheon Technical Services Center, a government-owned, contractor-operated facility.

**1.4.1 M26 Transmitter.** The M26 transmitter is capable of programming and remotely activating any of the present and future receiver types. The RAMS transmitter has four unique and three common transmission codes. The M26 has the capability of simultaneously firing any number of RAMS receivers within range or sequential firing of at least four groups of receivers. The M26 has an interface to provide the capability of being remotely functioned by the RAMS M16 receiver, which provides a relay capability.

**1.4.2 M16 Receiver.** The M16 receiver is reusable and is capable of detonating up to four M-6 electric blasting caps at a 100-foot range from the receiver when using WD-1 field wire. This receiver is capable of simultaneously firing up to four series-connected electric blasting caps. The M16 receiver has the same output characteristics as the M122.

**1.4.3 XM17 Receiver.** The XM17 receiver shall be expendable. It shall be compatible with the M26 Transmitter. No dimension shall exceed 5 inches with a volume not to exceed 20 cubic inches. The XM17 receiver shall be compatible with night vision goggles. The XM17 will have the capability of detonating one M7 non-electric military blasting cap. The XM17 test items were produced from the M16 receivers available from the previous testing. The XM17 receiver is physically similar to the M16 receiver with the exception of the stem assembly (exploding foil initiator (EFI), nipple, and booster). Internally, the electronics consist of a radio frequency (RF) board, control boards, and a fire board. Only the fire board was altered (i.e., to initiate the EFI) from the M16 receiver to adapt to this configuration. Unless otherwise noted, all types used modified M16 housings.

- The Type 1 configuration is a full up tactical receiver with full up tactical electronics, a loaded EFI, a loaded stem, and a loaded cap. All functions could be performed by this receiver. This receiver could receive signals from the M6 transmitter, process the signals, and initiate the stem assembly, thereby initiating an M7 non-electric blasting cap.

- The Type 2 configuration consisted of a dummy mass housing with no electronics, a loaded EFI, a loaded stem, and a loaded cap. The purpose of this type of receiver is to determine the durability and reliability of the stem assembly by subjecting the receiver to various environments (e.g., loose cargo,

secured cargo, drop tests) and then functioning the stem assembly. The stem assembly is detachable from the Type 2 receiver and can be functioned to determine its reliability and durability.

- The Type 3 configuration consisted of a receiver with a blank RF board, a blank controller board, and a functional fireboard; a Modified A housing; loaded EFI; a loaded stem; and a loaded cap. Test procedures were established to determine the functionality of the fireboard.

- The Type 4 configuration consisted of a receiver with full-up tactical electronics, a Modified A housing, an inert EFI, an inert stem, and an inert cap.

**1.4.4 Packaging.** The RAMS components, one M16 transmitter, one M6 battery retainer, six receivers, one flashlight, ten battery connector boards, and two antennas are packed in a PA108 container, a commonly used shipping container. Additional receivers will be packed nine to a PA 108 container.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Explosives- RAMS

**Reference** (Grady and Fendick, 2004):

Grady, E., & Fendick, K. (2004). System Evaluation Report (SER) for the Remote Activation Munition System (RAMS) M17 Receiver and AM85 Trainer Materiel Release: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 42747903. DTIC ADB302986.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*RECEIVERS, \*AMMUNITION, \*REMOTE SYSTEMS, \*ELECTRIC DETONATORS, TEST AND EVALUATION, ACTIVATION, MANUFACTURING, DECISION MAKING, PRODUCTION, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, CLASSIFICATION

Identifiers:

(U) \*MATERIEL RELEASE, \*REMOTE ACTIVATION MUNITION SYSTEM, RAMS(REMOTE ACTIVATION MUNITION SYSTEM), XM85 TRAINER, SUITABILITY, RAMS M17 RECEIVER

**System Description:**

The RAMS is a fielded system that provides the capability to remotely control the detonation of demolition charges or the remote operation of other items of equipment, such as beacons, laser markers, radio functioning munitions, etc. The four basic components of the RAMS are the M26 transmitter (with antenna), the M6 auxiliary power pack (APP) for the transmitter, the M16 receiver (with antenna), and the M1 flashlight. The M17 receiver is an additional component for use with the RAMS. It is a single-shot receiver capable of detonating an M7 non-electric blasting cap. This evaluation focuses on the M17 receiver and the XM85 trainer. The RAMS has a nominal range of 2 kilometers (km) line of sight (LOS) over dry sand and 5 km LOS over dry sand with the APP. Each of the RAMS components individually fits in the shirt breast pocket of the present battledress uniform. The RAMS will be operated and maintained by the same personnel that presently operate and maintain the M122 Demolition Firing Device. The RAMS (the M26 transmitter, the M16 receiver, and the APP) uses 9-volt batteries. The M16 receiver will be maintained as a Class VII item. The M17 receiver is used to initiate non-electric blasting caps (M7) and is disposable. The XM18 receiver, capable of producing a mechanical output (push/pull), will be added at a later date. The RAMS is being developed by the U.S. Army Research Laboratory (ARL) and produced by Raytheon Technical Services Center, a government-owned, contractor-operated facility.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Explosives- RAMS MI

**Reference** (ATEC, 2003):

ATEC. (2003). System Evaluation Report (SER) for the Magneto-Inductive Remote Activation Munition System (MI RAMS): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. DTIC ADB292703

**Key Words:**

Fields and Groups:

191100 - Nuclear Weapons

Descriptors:

(U) \*INTEGRATED SYSTEMS, \*REMOTE SYSTEMS, \*ELECTRIC DETONATORS, TRAINING DEVICES, ARMY EQUIPMENT, SYSTEMS ANALYSIS, LIFE CYCLE MANAGEMENT

Identifiers:

(U) SER(SYSTEM EVALUATION REPORT), MI RAMS (MAGNETO INDUCTIVE REMOTE ACTIVATION MUNITION SYSTEM), SDD(SYSTEM DEVELOPMENT AND DEMONSTRATION PHASE)

**System Description:**

Magneto-Inductive Remote Activation Munition System (MI RAMS).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Explosives- RAMS MI

**Reference** (Coladonato et al., 2008):

Coladonato, S., White, D., & Eberly, D. (2008). System Evaluation Report (SER) for the Firing Device, Demolition: Magneto-Inductive Remote Activation Munition System (MI-RAMS), M156 (M27 Transmitter and M39 Type a Receiver), Milestone C. TC-Standard/Full-Rate Productions and Full Materiel Release Decision U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 8137100045. DTIC ADB339036.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

090100 - Electrical and Electronic Equipment

190100 - Ammunition and Explosives

Descriptors:

(U) \*TEST AND EVALUATION, \*FIRING MECHANISMS(WEAPON), \*OPERATIONAL EFFECTIVENESS, \*TRANSMITTER RECEIVERS, \*DEMOLITION, ACTIVATION, REMOTE SYSTEMS, TEST FACILITIES, SAFETY, DECISION MAKING, MAGNETIC INDUCTION, VERIFICATION

Identifiers:

(U) \*FIRING DEVICES, \*M156 TRANSMITTER/RECEIVER

**System Description:**

The MI-RAMS is designed to provide the employing unit the capability to remotely and safely initiate demolition targets through most media and materiel. MI-RAMS augments the capability provided by the

Remote Activation Munitions System (RAMS), which uses radio frequencies (RFs), by extending the remote capability through media and materials that reflect/refract or are otherwise impenetrable by RF signals. The MI-RAMS can propagate a signal (coded or otherwise) through virtually any material such as concrete, earth, water, manmade and natural structures, caves, bunkers, underground, and underwater. MI-RAMS provides a capability to remotely control the initiation of demolition charges or the remote operation of other items of equipment, such as beacons, laser markers, radio functioning, weapons, and ground marking lights. The remote control capability reduces the requirement to lay transmission lines to initiate explosive devices, especially in urban operations, reduces breaching times, decreases detection of demolitions because there is no shock tubes leading back to the initiating receiver, and improves Soldier survivability by providing a remote initiation capability that protects the Soldier from exposure to enemy fires. The system is man portable. The MI-RAMS will not impede the Soldier's ability to shoot, move, or communicate.

The MI-RAMS is being developed by the U.S. Army Research Laboratory (ARL) Adelphi, MD, with units produced by Magneto-Inductive Systems Limited-USA (MISL-USA). The MI-RAMS Type B receiver, a tri-axial antenna, a hybrid antenna, and a 9. I-meter loop antenna are in development and will be added at a later time.

MI-RAMS consists of three main components: transmitter (and its antenna), APS for the transmitter, and two types of receivers (Type A and Type B and their antenna). There is also a Type B receiver trainer. All MI-RAMS components use 9-volt (V) batteries. A brief description of the components follows.

**1. MI-RAMS Transmitter.** The MI-RAMS transmitter has a design range of 150 meters (492 feet) through water, sand, earth, rock, and manmade and natural structures. When using the APS, the transmitter has a design range of 200 meters (656 feet) through the same media. The transmitter has seven unique factory-set transmission codes. These seven unique codes are field programmable via a link from the transmitter to the receivers. The transmitter has the capability of simultaneously firing any number of MI-RAMS receivers within range or sequential firing of at least four groups of receivers. The transmitter has a ready to transmit light-emitting diode (LED) that is compatible with present night vision goggles (NVGs).

**2. MI-RAMS Auxiliary Power Source.** The APS attaches directly to the MI-RAMS transmitter. The APS extends the range of the transmitter. The APS is powered by 9V batteries.

**3. MI-RAMS Type A Receiver.** The Type A receiver is designed to be programmed to the seven unique transmission codes of any MI-RAMS transmitter and only functions by those unique transmission codes or until reset. These codes can be retained when the receiver is turned off. The programmed unique transmission codes can be held in memory for a minimum of 30 days. The receiver indicates to the user that it has been successfully programmed via the use of an LED that is compatible with present NVGs. The receiver is designed to be functioned by an MI-RAMS M27 transmitter and an M152 RAMS transmitter (included with the M152/MK152) in a relay or daisy-chain configuration through an external relay cable. The receiver provides an electrical output capable of detonating up to four electric blasting caps (M6) at a 100-meter (328-foot) range from the receiver using WD-I field wire. The Type A receiver is reusable and is safe to use when attached to power line towers, electric generators, or other emitters.

**4. MI-RAMS Type B Receiver.** The Type B receiver has the same functionality and capability as the Type A, but is an expendable, one-time use device. The Type B receiver has been designated the XM40. The Type B receiver is not covered in this report. It is under development, will undergo its own Production Qualification Test (PQT) later in 2008, and will be made available as a Type B kit.

**5. MI-RAMS Type B Trainer.** The trainer is an inert trainer for the Type B receiver and has been designated XM159. The trainer does not contain energetics but is physically identical to the Type B receiver. To simulate functioning, the trainer output is a blinking LED located at the stem housing. The trainer is not covered in this report. It is under development, will undergo its own PQT later in 2008, and will be made available as a Type B trainer kit.

**6. Packaging.** The M156 MI-RAMS kit uses an M156 MI-RAMS PAI08 ammo container containing one transmitter, one transmitter loop antenna, one APS, one cable for APS, three receivers and three receiver rod antennas, and five battery boards. The technical manual (TM) and instruction sheet are also included in the kit.

#### **Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

**System Short Name:** SER- Explosives- SDK

**Reference** (Grady et al., 2000):

Grady, E., Fendick, K., & White, D. (2000). System Evaluation Report (SER) for the Special Operations Forces (SOF) Demolition Kit Large (SDK) Explosively Formed Penetrator Milestone III: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 03078316. DTIC ADB260233.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

190900 - Explosions

Descriptors:

(U) \*PENETRATION, \*DEMOLITION CHARGES, MILITARY REQUIREMENTS, SURVIVABILITY, SPECIFICATIONS, SHAPED CHARGES, SYSTEMS ANALYSIS, QUALITY ASSURANCE, SPECIAL OPERATIONS FORCES

Identifiers:

(U) EXPORT CONTROL, EXPLOSIVELY FORMED PENETRATORS, ORD(OPERATIONAL REQUIREMENTS DOCUMENT)

**System Description:**

The SDK provides the interdicting SOF soldier with the capability to tailor charges to the target by using a variety of inert components and attachment mechanisms. Current methods force the SOF soldier to improvise warhead designs from suitable components, attachment mechanisms, and housings available in the interdicting area. The SDK provides the SOF soldier with a common set of demolition charges and attachment devices. When all components have been fielded, the kit will contain three sizes of conical shaped charges (two each small, medium, and large), four sizes of Linear Shaped Charges (LSCs) (two each extra small, small, medium, and large), and three sizes of EFP charges (three each of small, medium, and large). The kit also contains tools for molding C-4, attachment tape, telescoping staffs, two sizes of magnets, nylon wire ties, bungee cord, tripods for the EFP charges, a mounting bracket for the small EFPs, and wooden storage boxes. The SDK consists of all of the components in a single box; replenishment will be through individual item sets. This evaluation will focus on the performance characteristics of the large EFP. Safety danger zones have been established for the large EFP based on the results of the arena fragmentation test in concert with the Maximum Range Prediction for the XM303 SDK Warheads.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Explosives- SDK- FP-EFP

**Reference** (Grady et al., 2006):

Grady, E., Pandullo, M., & Leadore, G. (2006). System Evaluation Report (SER) for the Special Operations Forces Demolition Kit (SDK) Fence Piercing-Explosively Formed Penetrator (FP-EFP): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 62919198. DTIC ADB321110.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*DEMOLITION, \*SHAPED CHARGES, \*DEMOLITION CHARGES, \*SPECIAL OPERATIONS FORCES, PRODUCTION, FIRING TESTS(ORDNANCE), WEAPON SYSTEM EFFECTIVENESS, TEST FACILITIES, EXPLOSIVE FORMING, TEST METHODS, PROJECTILES

Identifiers:

(U) \*FENCE PIERCING-EXPLOSIVELY FORMED PENETRATORS, SYSTEM EVALUATION REPORTS, FP-EFP(FENCE PIERCING-EXPLOSIVELY FORMED PENETRATOR), SDK(SPECIAL OPERATIONS FORCES DEMOLITION KIT), MR(MATERIAL RELEASE)

**System Description:**

The SDK provides the interdicting Special Operations Force's (SOF) Soldier with the capability to tailor charges to the target by using a variety of inert components and attachment mechanisms. Previous methods forced the SOF Soldier to improvise warhead designs from suitable components, attachment mechanisms, and housings available in the interdicting area. The SDK provides the SOF Soldier with a common set of demolition charges and attachment devices. When all components have been fielded, the kit will contain three sizes of conical-shaped charges (two of each size), four sizes of linear-shaped charges (two of each size), three sizes of single-penetrator EFPs (three of each size), cable cutters, and several preplanned, product-improved EFP (such as the FP-EFP) with enhanced capabilities for special purpose missions. The kit also contains tools for molding C4, attachment tape, telescoping staffs, two sizes of magnets, nylon wire ties, bungee cord, tripods for the EFP charges, and a mounting bracket for the small EFPs. The SDK will consist of the components in a wooden box. Replenishment will be through individual item sets. The FP-EFP design is based on the medium EFP. The housing was extended to allow additional C4. The liner is a different design.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Explosives- SDK M303

**Reference** (Grady et al., 1999):

Grady, E., Cross, M., & White, D. (1999). System Assessment (SA) for the M303 Special Operations Forces Demolition Kit (SDK) Full Materiel Release: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. DTIC ADB246301.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

150600 - Military Operations, Strategy and Tactics

190100 - Ammunition and Explosives

Descriptors:

(U) \*DEMOLITION CHARGES, \*SPECIAL OPERATIONS FORCES, TEST AND EVALUATION, MATERIEL, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, EXPLOSIVE WARHEADS

Identifiers:

(U) EFP(EXPLOSIVELY FORMED PENETRATOR), SDK(SOF DEMOLITION KIT), COI(CRITICAL OPERATIONAL ISSUES), PVT(PRODUCTION VERIFICATION TEST), ORD(OPERATIONAL REQUIREMENTS DOCUMENTS), FULL MATERIEL RELEASE, SYSTEM ASSESSMENT, M303 DEMOLITION KIT

**System Description:**

The SDK provides the interdicting SOF soldier with the capability to tailor charges to the target by using a variety of inert components and attachment mechanisms. Current methods force the SOF soldier to

improvise warhead designs from suitable components, attachment mechanisms, and housings available in the interdicting area.

The SDK provides the SOF soldier with a common set of demolition charges and attachment devices. The kit contains three sizes of conical shaped charges (two each small, medium, and large), four sizes of Linear Shaped Charges (LSCs) (two each extra small, small, medium, and large), and two sizes of each EFP charges (three each of small and medium). The kit also contains tools for molding Composition 4 explosive (C4), attachment tape, telescoping staffs, two sizes of magnets, nylon wire ties, bungee cord, tripods for the EFP charges, a mounting bracket for the small EFPs, and wooden storage boxes. The first fielding of the kit will consist of all of the components in a single box; replenishment will be through individual item sets.

This evaluation will focus on the performance characteristics of the small and medium EFPs. Safety danger zones have been established for the two sizes of EFPs based on results of the arena fragmentation test in concert with the Maximum Range Prediction for the XM303 SDK Warheads.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Explosives- SDK- MEFP-CC

**Reference** (Grady, 2004):

Grady, E. (2004). System Evaluation Report (SER) for the Special Operations Forces Demolition Kit (SDK) Multi-Faceted Explosively Formed Penetrator (MEFP) and Cable Cutter (CC) for Milestone C: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 43087915 / i. DTIC ADB297434.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*DEMOLITION, \*SHAPED CHARGES, \*CABLE CUTTING DEVICES, TEST AND EVALUATION, LINEAR SYSTEMS, ACCEPTANCE TESTS, RELIABILITY, MISSIONS, SYSTEMS ANALYSIS, TEST FACILITIES

**System Description:**

The SDK provides the interdicting Special Operations Forces (SOF) Soldier with the capability to tailor charges to the target by using a variety of inert components and attachment mechanisms. Current methods force the SOF Soldier to improvise warhead designs from suitable components, attachment mechanisms, and housings available in the interdicting area. The SDK provides the SOF Soldier with a common set of demolition charges and attachment devices. When all components have been fielded, the kit will contain three sizes of conical-shaped charges (two of each size), four sizes of linear-shaped charges (two of each size), and three sizes of single-penetrator EFPs (three of each size). The kit also contains tools for molding C4, attachment tape, telescoping staffs, two sizes of magnets, nylon wire ties, bungee cord, tripods for the EFP charges, a mounting bracket for the small EFPs, and wooden storage boxes. The SDK consists of all of the components in a single box. Replenishment will be through individual item sets. The MEFP has the same dimensions and weight as the medium EFP, except that the liner is divided into 19 sections, which are projected individually in a fan required to be 10 feet in diameter at 100 meters range. The CCs are small linear-shaped charges configured to be attached to, and cut cables, rebars, and rods. There were two sizes tested; a small (32 mm diameter) and a large (50 mm diameter).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Explosives- SDK- MEFP-CCs

**Reference** (Grady, 2005):

Grady, E. (2005). System Evaluation Report (SER) for the Special Operations Forces Demolition Kit (SDK) Multi-Faceted Explosively Formed Penetrator (MEFP), Small and Large Cable Cutters (CCs), and Large Cable Cutters (CCs), and Medium and Large Linear Shaped Charges (LSC): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 52978058. DTIC ADB312917.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*PROJECTILES, \*WEAPON SYSTEM EFFECTIVENESS, \*CUTTERS, \*SHAPED CHARGES, \*DEMOLITION CHARGES, TEST AND EVALUATION, ACCEPTANCE TESTS, CABLES, SPECIAL OPERATIONS FORCES, SAFETY, KITS, QUALIFICATIONS, EXPLOSIVE FORMING, RELIABILITY, SURVIVABILITY, FIRING TESTS(ORDNANCE)

Identifiers:

(U) \*DEMOLITION KITS, \*EXPLOSIVELY FORMED PENETRATORS, \*CABLE CUTTERS, LSC(LINEAR SHAPED CHARGES), SDK(SPECIAL OPERATIONS FORCES DEMOLITION KIT) MEFP(MULTI-FACETED EXPLOSIVELY FORMED PENETRATOR), PQT(PRODUCTION QUALIFICATION TEST)

**System Description:**

The SDK provides the interdicting Special Operations Force's (SOF) Soldier with the capability to tailor charges to the target by using a variety of inert components and attachment mechanisms. Current methods force the SOF Soldier to improvise warhead designs from suitable components, attachment mechanisms, and housings available in the interdicting area. The SDK provides the SOF Soldier with a common set of demolition charges and attachment devices. When all components have been fielded, the kit will contain three sizes of conical-shaped charges (two of each size), four sizes of linear-shaped charges (two of each size), three sizes of single-penetrator EFPs (three of each size), cable cutters and several preplanned, product-improved EFP (such as the MEFP) with enhanced capabilities for special purpose missions. The kit also contains tools for molding C4, attachment tape, telescoping staffs, two sizes of magnets, nylon wire ties, bungee cord, tripods for the EFP charges, and a mounting bracket for the small EFPs. The SDK will consist of the components in a wooden box. Replenishment will be through individual item sets.

**MEFP.** The MEFP has the same dimensions and weight as the medium EFP, except that the liner is divided into 19 sections, which are projected individually in a fan required to be 10 feet in diameter at 100 meters (m) range. The MEFP is to provide additional capabilities for multiple hits/penetrations against soft-skinned targets.

**CCs.** The CCs are small conical shaped charges configured to be quickly attached to and cut cables, rebar, and rods. The CC is also a Pre-Planned Product Improvement (P3I), which is required by an amendment to the Operational Requirements Document (ORD) (reference 2) to provide the capability to severe cable/rebar/rod targets

**LSC.** The LSCs are 0.33 m long. The medium LSC is 40 millimeters (mm) wide and the large LSC is 50 mm wide with V-shaped housing liners which are shaped into linear penetrators.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to

Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458:

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**System Short Name:** SER- Explosives- SLAM

**Reference** (Grady et al., 2001):

Grady, E., Myers, J., Walker, T., & Abeyta, R. (2001). System Evaluation Report (SER) for the M4, Selectable Lightweight Attack Munition (SLAM): U.S. Army Evaluation Center (AEC), Aberdeen Proving Ground, MD. Report #: 11138442. DTIC ADB265692.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*ANTIMATERIEL AMMUNITION, ACCEPTANCE TESTS, EXPERIMENTAL DATA, SURVIVABILITY, DEMOLITION, MOVING TARGETS, ARMY EQUIPMENT, PACKAGING, SYSTEMS ANALYSIS, MULTIPURPOSE, ANTITANK AMMUNITION

Identifiers:

(U) \*SLAM(SELECTABLE LIGHTWEIGHT ATTACK MUNITION), \*M-4 TANKS

**System Description:**

1.4.1 General. The SLAM is a multipurpose, one-shot, antimateriel and demolition device. It is compact (40 cubic inches), easily carried by Special Operations Forces (SOF) and Army personnel, and lightweight (3 pounds). As an antimateriel munition, the SLAM will be used against moving targets such as lightly armored personnel carriers and wheeled- or tracked support vehicles. As a demolition device, it will be used against stationary targets, such as electrical transformers, parked aircraft, small fuel-storage sites (under 10,000 gallons), and ammunition dumps.

1.4.2 To give the soldier flexibility in employment, the SLAM is amenable to activation in a variety of ways:

a. In the mine mode, it will be set off by its (inherent) magnetic-influenced fuze when a target with suitable ferrous-metal content passes overhead.

b. In the side-attack mode, the SLAM will be placed off-route in a vertical orientation and will be set off by its fuze as the target activates the PIR sensor.

c. In the time-activated mode (also called the TD mode or simply the timed mode), the SLAM will be set off at a time chosen by the soldier. The options inherent to the SLAM are the four detonation times of 15,30,45, and 60 minutes. For missions that need a longer time-delay (e.g., a matter of days), the SLAM can be initiated by the M147 Time-Delay Firing Device.

d. In the command-activated mode (also called the command-detonation mode or the hardwire mode), the SLAM will be set off when the soldier transmits the signal. The soldier can use either a standard M6 (electric) or M7 (nonelectric) blasting cap coupled to the SLAM by means of an M1A4 adapter. In this mode, the SLAM is, in effect, identical to the M3 Demolition Attack Munition (DAM).

1.4.3 The M4 SLAM is a nondevelopmental item acquisition program. It is a slightly modified version of the Type-Classified Standard Special Operations Command (SOCOM) M2 SLAM. The modification consists of an SD feature replacing the SN function. This modification is an internal change involving modification of the safe and arming (S&A) by eliminating the SN piston actuator and rerouting an electronic trace on the flexible circuit that provides the fire signal. The electronics and batteries of both munitions are the same. The safety features of the S&A assembly which maintain safety, affect arming, and provide arming delay are unchanged. The M4 also has the same warhead, warhead liner, acceptor lead, transfer lead, detonator, stab detonator, and coupler as the M2 SLAM. All timing features governing SD, TD, antidemolition, antitamper, antisturbance, and safe separation remain the same. All of these functions are governed by an unchanged Application-Specific Integrated Circuit. Externally, there is a color change to allow visual discrimination between the two munitions from a distance in the field. The M4 has a green body and a black warhead liner whereas the M2 presently has a green body and a green warhead liner. The training kit is nearly identical to the SOCOM version. The only difference is that the pin showing SN has been removed.

1.4.4 In the mine- and side-attack modes, the SLAM requires the soldier to choose and preset one of three SD times (4, 10, and 24 hours). The SLAM will then remain in the mine- or side-attack mode until the preset time has passed, after which the SLAM will neutralize itself. It does this by mechanically rupturing the firing train. This SD condition is to be apparent from 12 feet away, although currently there is no requirement for recoverability (and use in the command-activated mode).

1.4.5 The SLAM has an anti-tamper switch that is to detonate the warhead if the selector switch is rotated, once the munition has been armed. It also has a low-voltage detect feature, which is intended to shut down the electronics when the voltage goes below a certain level. The SLAM has an omega-shaped sight and two bore sights for aiming.

1.4.6 The SLAM trainer is a completely inert duplicate of the tactical unit. It has no electronics or explosives. The size and shape are the same, and the initiation and setting procedures can be simulated with the trainer.

1.4.7 Warhead. The warhead uses an explosively formed penetrator (EFP) as its destructive mechanism. The warhead consists of a high explosive with a metal liner. When the explosive is set off, the liner is deformed and projected forward at high speed. The resulting slug must have enough energy to defeat the target vehicles at the required standoff ranges.

1.4.8 Operational Use. The basic combat load will consist of two SLAMs per soldier. For SOF units, the SLAM will replace the M-15, M-19, M-21, and M24 mines. The SLAM will supplement the expedient demolition and techniques presented in FM 5-250, "Explosives and Demolitions." The SLAM is a Class-V item of supply and will be issued to users when needed. Once the SLAM is emplaced and aimed, the operator selects the required mode of operation and initiates the arming sequence. When the safe-separation time has elapsed, the SLAM enables itself and will function in the mode chosen.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Explosives- SLAM

**Reference** (Smyers et al., 2008):

Smyers, P., Yaw, S., Woodworth, J., Beran, G., Merchant, D., Fuller, J., Rajkowski, E., VanHeest, J., Weiss, R., & Whalen, J. (2008). Operational Test Agency Assessment Report (OAR) for the Munition, Selectable Lightweight Attack (SLAM): M4E1 and SLAM Improved Functional Trainer (Sift): M320E1: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. ARMY EVALUATION CENTER ALEXANDRIA VA. DTIC ADB345384.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA), OTA Assessment Report (OAR), OTA Milestone "x" Assessment Report (OMAR), OTA Evaluation Report (OER), OTA Follow-on Evaluation Report (OFER), Operational Test Report (OTR), Abbreviated Operational Test Report (AOTR), Army Input to the OTA Report (AIOR)

\*antimateriel ammunition, \*training devices, \*test and evaluation, reliability, target activated munitions, safety, aiming, shelf life, hit probabilities, human factors engineering, operational effectiveness, survivability, penetration

slam(selectable lightweight attack munition), sift(slam improved functional trainer), m4e1, m320e1, repp(reusable environmental protection pack), side attack mode, blowing sand environments, electromagnetic environmental effect, high altitude electromag

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*ANTIMATERIEL AMMUNITION, \*TRAINING DEVICES, \*TEST AND EVALUATION, RELIABILITY, TARGET ACTIVATED MUNITIONS, SAFETY, AIMING, SHELF LIFE, HIT PROBABILITIES, HUMAN FACTORS ENGINEERING, OPERATIONAL EFFECTIVENESS, SURVIVABILITY, PENETRATION

Identifiers:

(U) SLAM(SELECTABLE LIGHTWEIGHT ATTACK MUNITION), SIFT(SLAM IMPROVED FUNCTIONAL TRAINER), M4E1, M320E1, REPP(REUSABLE ENVIRONMENTAL PROTECTION PACK), SIDE ATTACK MODE, BLOWING SAND ENVIRONMENTS, ELECTROMAGNETIC ENVIRONMENTAL EFFECT, HIGH ALTITUDE ELECTROMAGNETIC PULSES, NUCLEAR BIOLOGICAL CHEMICAL CONTAMINATION SURVIVABILITY, INTEGRATED LOGISTICS SUPPORTABILITY, CLIMATIC CONDITIONS, COMMAND DETONATION, DEMOLITION DEVICES, MAGNETIC INFLUENCE FUZING, MANPRINT, PASSIVE INFRARED, SELF-DEACTIVATION, SEPARATION TIME, STATIONARY TARGETS, SUITABILITY, TIME ACTIVATION, TRANSPORTABILITY, WATER IMMERSION

#### **System Description:**

**The M4E1 SLAM** is a multipurpose, one-shot anti-materiel and/or demolition device intended for use against armored personnel carriers, parked aircraft, wheeled or tracked support vehicles and stationary targets such as electrical transformers, small (under 10,000 gallons) fuel storage and ammunition storage sites. The SLAM is a target-activated munition using magnetic influence fuzing, passive infrared, time activation, or command detonation (CD) modes of employment. When in a Timed Demolition (TD) mode, the operator can select one of the seven detonation times of %, Vz, VA, 1,4, 10, or 24 hours. When used in the Bottom Attack (BA) and Side Attack (SA) modes, the operator selects one of the seven times as the SD time. When used in the CD mode, the operator will install a standard M6 or M7 Blasting Cap and use a standard blasting machine or firing device (M57E1 or MI47). The SLAM is compact, lightweight (approximately 3 pounds), and easily portable for use in small quantities by U.S. Army personnel during insertion operations. The warhead is an explosively formed penetrator (EFP) consisting of a liner and high explosive. The EFP is designed to contain ample energy to defeat the targets at the required distances up to 25-foot standoff ranges. The operational controls and sequence for the M4E1 SLAM has been changed from the M4 SLAM in order to enhance safety features. The user is forced to follow a strict sequence of steps to employ the SLAM which prevents or minimizes operator error.

**The M320E1 SIFT** is a multi-use training device that replicates the form and function of the tactical M4E1 SLAM. The SIFT's internal electronics and sensors are identical to those in the SLAM. Because of this, the SIFT can be used to evaluate the effectiveness and suitability of the tactical SLAM's sensors. The SIFT uses a 9-volt off-the-shelf battery and may be used multiple times. The M320E1 is an improvement over the M320 by providing more effective training through visual and audio feedback when employment procedures are implemented correctly and incorrectly. The SIFT is employed in the same manner, with the same procedures, as the SLAM.

**Modification #1 M320E1 SIFT (Mod1 SIFT).** Modi SIFT was designed and produced in response to limitations discovered during the Production Qualification Test (PQT) and Customer Test (CT). The modi SIFT incorporates an enhanced buzzer and a more robust battery activation plunger.

**Modification #2 M320E1 SIFT (Mod2 SIFT).** Mod2 SIFT was designed and produced in response to durability limitations of modi SIFT discovered during **Contractor Demonstration #1**. Mod2 SIFT features a more robust battery activation plunger and plunger sleeve designed to better withstand the abuse attributed to being set in bottom attack mode in sand/dirt.

**Reusable Environmental Protection Pack (REPP).** The REPP is the storage and transport container for the individual SLAMs and SIFTs. It is a two-piece plastic container consisting of top and bottom halves. The bottom half has a recess for holding mounting wire, instruction card, and an alignment pin that will only allow a SLAM or SIFT to fit inside with the primary selector switch in the safe shipping position. A fixed gasket provides a waterproof seal. The REPP utilizes four clasps to close.

**Modified Reusable Environmental Protection Pack (Mod REPP).** The mod REPP is a storage container for the individual SLAM or SIFT, designed and produced in response to issues that arose with the original REPP during the PQT and CT. The mod REPP features two clamshell hinges on one side and two modified clasps on the other. The mod REPP is intended to protect the SLAM and SIFT during adverse environments better than the original REPP, and to provide the Soldier with easier access to, and repacking of, the SIFT.

#### **Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

**System Short Name:** SER- Explosives- TD-SYDET

**Reference** (ATEC, 2001):

ATEC. (2001). System Evaluation Report (SER) for the XM153 Time/Delay/Sympathetic Detonator (TD/SYDET) and XM316 Trainer: U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB269646.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*SYMPATHETIC DETONATIONS, SYSTEMS ANALYSIS, DETONATORS, TIME DELAY FUZES

Identifiers:

(U) SER(SYSTEM EVALUATION REPORT), XM153, XM316

**System Description:**

XM153 Time/Delay/Sympathetic Detonator (TD/SYDET) and XM316 Trainer.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Explosives- TD-SYDET

**Reference** (Grady, 2005):

Grady, E. (2005). System Evaluation Report (SER) for the Milestone (MS) C for the XM153 Time Delay/Sympathetic Detonator (TD-SYDET) and XM316 Trainer: U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB309733.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*EXPLOSIVE CHARGES, \*SYMPATHETIC DETONATIONS, \*DETONATORS, \*TIME DELAY FUZES, \*TIME SWITCHES, TEST AND EVALUATION, SURVIVABILITY, TRAINING DEVICES, LIQUID CRYSTAL DISPLAY SYSTEMS, LIGHTWEIGHT, ACOUSTIC DETECTORS, SPECIAL OPERATIONS FORCES

Identifiers:

(U) \*TIME DELAY DETONATORS, TD-SYDET(TIME DELAY/SYMPATHETIC DETONATOR), XM3316 TRAINING DEVICE, SER(SYSTEM EVALUATION REPORT), XM153 DETONATORS

**System Description:**

The TD-SYDET is a small, lightweight detonator developed to simultaneously detonate numerous unlinked explosive charges through the functioning of one explosive charge. The TD-SYDET is compatible with demolition munitions which accept an M6 or M7 blasting cap, allows pre-assembled demolition packages, and reduces the user's time on target. The TD-SYDET is being developed for the Special Operations Forces (SOF). The TD-SYDET consists of an acoustic sensor, arming tab, explosive stem, booster cap, liquid crystal display (LCD), and time delay switches. The detonator works in two different modes; sympathetic and time delay. In the sympathetic mode, the acoustic sensor of the TDSYDET detects a nearby explosion and, after verification of the source, will detonate its explosive stem assembly

and booster cap. During testing, the nearby explosion is termed the donor charge. The TD-SYDET is required to detonate when exposed to C4, the Selectable Lightweight Attack Munition (SLAM), and the Claymore mine. Line of sight is required. In the time delay mode, the TD-SYDET will detonate its explosive at a pre-set time, with a countdown window of up to 30 days. Three different types of tactical TD-SYDETs were used during the testing; types I, II, and IV.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- FBN

**Reference** (Lee and Jastrab, 2002):

Lee, C. C., & Jastrab, G. (2002). System Evaluation Report (SER) for the Family of Batons and Nightsticks (FBN): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 21068635. DTIC ADB277867.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

050500 - Sociology and Law

230200 - Human Factors Engineering & Man Machine System

Descriptors:

(U) \*CONTROL STICKS, TEST AND EVALUATION, IMPACT TESTS, PATROLLING, OFF THE SHELF EQUIPMENT, OPERATIONAL EFFECTIVENESS, SHOCK TESTS, LAW ENFORCEMENT, MILITARY POLICE, RIOT CONTROL

Identifiers:

(U) \*BATONS, \*NIGHTSTICKS

**System Description:**

a. The FBN consists of three types of batons - the Patrol Baton (Model PR-24XTS), the Riot Control Baton (Model SX-24/36), and the Concealable Baton (Model Autolock-21).

(1) The Patrol Baton is intended for use by the military police (MP) soldier while conducting patrols. Its length is 14.26 inches when closed and 24.13 inches when opened; it weighs 23.31 ounces; and it is constructed with a black, anodized aluminum frame with an expandable polycarbonate shaft. The shaft is extended to the open position with a wrist/forearm flicking action by the user or by pulling the shaft out of the handle by hand. There is a lock to secure the shaft in place when it is extended; the button, located on the side of the handle toward the forward end, must be depressed to unlock the shaft to return it to the closed position. It has a nonslip, detachable perpendicular side handle and a belt holder.

(2) The Riot Control Baton is intended to be used during civil disturbance situations. Its length is 23.30 inches when closed and 36.67 inches when opened; it weighs 29.45 ounces and it is constructed with a black, anodized aluminum frame and an expandable, polycarbonate shaft. There is a lock to secure the shaft in the closed position (the button for the lock is on the side of the handle) and also to lock it in place when it is extended (this button is located on the side of the handle toward the forward end); the button on the lock must be depressed before extending or collapsing the baton. After unlocking the shaft in the closed position, it can be extended with a wrist/forearm flicking action by the user or by pulling the shaft out by hand. To collapse the baton and return it to the closed position, the user must depress the release button and push the shaft into the handle by hand. A belt holder is provided.

(3) The Concealable Baton is intended for use when conducting investigative operations. Its length is 8.99 inches when closed and 20.31 inches when opened; it weighs 19.76 ounces; it has a telescoping, two-piece, hardened steel, expandable shaft with gunmetal finish. The shaft can be extended from the handle with a wrist/forearm flicking action by the user or by pulling the shaft out by hand. To collapse the shaft and return it to the closed position, the user must depress a release button in the end of the handle and push the shaft into the handle by hand. A belt holder is available.

b. Currently, there are two standard issue batons available to the MP - the policeman's club (wood, 22-inches length, National Stock Number (NSN): 8465-00-641-8331, CTA 50-970, Line Item Number (LIN) E41960) and the riot control baton (wood, 36-inches length, CTA 50-970, LIN 80537N).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Fire Fighter- Glove- J-FIRE

**Reference** (Beran and Chipman, 2000):

Beran, G., & Chipman, M. (2000). System Assessment (SA) for the Joint Firefighter Integrated Response Ensemble (J-FIRE) Glove: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB254616.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

230400 - Protective Equipment

Descriptors:

(U) \*FIRE FIGHTING, \*PROTECTIVE CLOTHING, SIMULATION, CHEMICALS, OFF THE SHELF EQUIPMENT, COMMERCIAL EQUIPMENT, SYSTEMS ANALYSIS, GLOVES, FIRE RESISTANT MATERIALS, BUTYL RUBBER

Identifiers:

(U) J FIRE(JOINT FIREFIGHTERS INTEGRATED RESPONSE ENSEMBLE), FIS C(FIREFIGHTERS INTEGRATED SUIT COMBAT)

**System Description:**

The J-FIRE Glove is firefighter handwear providing both fire protection in accordance with NFPA standards and chemical liquid/vapor protection. The multilayer leather glove design incorporates a two-piece, 4-inch gauntlet cuff; a 15-ounce aluminized rayon dorsal surface; a 4-ounce gold thermal elk skin palmar surface; full-hand liner of fully-sewn, fire-retardant, self-extinguishing fabric; outer glove stitching of heat-resistant Kevlar™ 303 thread; and seams on index, middle, and ring fingers with gold thermal elk skin leather welting for additional support. Four sizes are available: medium, large, extra large, and extra extra large.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- FIS-C

**Reference** (Gasiorowski et al., 1998):

Gasiorowski, F., Chipman, M., Holman, C., Winters, J., Hannah, T., & Fuller, J. (1998). System Evaluation Report (SER) for the Firefighters Integrated Suit - Combat (FIS-C) (Type Classification - Standard Decision). : U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. OPTEC, Alexandria ,VA DTIC ADB234770.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

140200 - Test Facilities, Equipment and Methods

230400 - Protective Equipment

Descriptors:

(U) \*OFF THE SHELF EQUIPMENT, \*COMMERCIAL EQUIPMENT, \*FIRE FIGHTING, \*PROTECTIVE CLOTHING, \*FIRE RESISTANT MATERIALS, TEST AND EVALUATION, SIMULATION, DECISION MAKING, CHEMICALS, ILLNESS, CHEMICAL WARFARE, SYSTEMS ANALYSIS, GLOVES, BUTYL RUBBER

Identifiers:

(U) FIS C(FIREFIGHTERS INTEGRATED SUIT COMBAT), COTS(COMMERCIAL OFF THE SHELF), I SCBA(INTERSPIRO SELF CONTAINED BREATHING APPARATUS), J FIRE(JOINT FIREFIGHTERS INTEGRATED RESPONSE ENSEMBLE)

**System Description:**

The FIS-C configuration consists of the JSLIST Chemical Protective Overgarment, COTS Proximity Suit, COTS NomexTH Hood, COTS Firefighter's Helmet, Butyl Firefighting Glove System, COTS Firefighter's Crash Boot, and I-SCBA with Chemical Warfare Kit.

**a. JSLIST Chemical Protective Overgarment.** The JSLIST Chemical Protective Overgarment is a non-fire-retardant, two-piece outfit consisting of a jacket with integral hood and trousers with adjustable suspenders. The two-piece ensemble is designed to be worn over the Battle Dress Uniform or personal underwear. The material is a two-layer permeable system, consisting of a liquid protective outer shell and a carbon-based absorptive inner liner. This is the chemical-protective shirt and trousers portion of the FIS-C, which is worn under the outer, fire-protection garment. It is type classified "standard" and in production.

**b. COTS Firefighter's Proximity Suit.** The COTS Proximity Suit consists of a coat and trousers cut on patterns similar to the structural gear presently worn by military firefighters. The Proximity Suit provides the increased thermal protection required to fight aircraft or chemical fires. The Proximity Suit is worn over the JSLIST Chemical Protective Overgarment.

**c. COTS Firefighter's NomexTH Hood.** The COTS NomexTH Hood is a balaclava-style hood, of NomexTH knit fabric, worn over the head under the JSLIST NBC Protective Overgarment jacket to provide increased thermal protection ,to the head and neck area.

**d. COTS Firefighter's Helmet.** This is a standard firefighters' helmet, one size, adjustable with ratchet. The helmet has a gold face shield and modified COTS, aluminized shroud to protect the neck area.

**e. Butyl Firefighting Glove System.** The butyl firefighting glove system is the 14-mil butyl CB glove with cotton liner worn under the proximity glove for CB hand protection during firefighting operations.

**f. COTS Firefighter's Crash Boot.** The Firefighter's Crash Boot meets the NFPA standards for protected footwear for firefighters. The Crash Boot has a tractor-tread outsole, a steel toe, and an insulated Kevlar/NomexTH lining. It is already in use by the units.

**g. I-SCBA with Chemical Warfare Kit.** The I-SCBA is a compressed-air breathing apparatus for firefighting operations in a contaminated environment. The Chemical Warfare Kit includes the Interspiro Chemical Warfare mask. The I-SCBA consists of a 60-minute air cylinder, a breathing valve, a pressure gauge, connective hose and tubing, a shoulder harness, and a waistband. It weighs approximately 35 pounds. The I-SCBA has been approved by the National Institute of Occupational Safety and Health (NIOSH) and is the USAF Firefighter Self-contained Breathing Apparatus (SCBA).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- FOL

**Reference** (Jones and Zwicke, 1999):

Jones, R., & Zwicke, R. A. (1999). System Evaluation Report (SER) for the Manpack Version of the Family of Loudspeakers (FOL): U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-

OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 90137060 / SER 01-99. DTIC ADB241290.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

250400 - Voice Communications

Descriptors:

(U) \*LOUDSPEAKERS, TEST AND EVALUATION, COMMUNICATION EQUIPMENT, SOUND, TRANSPORTABLE, POWER SUPPLIES, SYSTEMS ANALYSIS, REMOTE AREAS, PSYCHOLOGICAL WARFARE, TEST FACILITIES

Identifiers:

(U) \*FOL(FAMILY OF LOUDSPEAKERS), AUDIO DISSEMINATION SYSTEM, PSYOP(PSYCHOLOGICAL OPERATIONS), SER(SYSTEM EVALUATION REPORT), MANPACKS

**System Description:**

The FOL System is a Non-Developmental Item (NDI). A Market Investigation (MI) was done in August 1993 to identify whether any commercial "off-the-shelf" (COTS) NDI of equipment could be used to satisfy the FOL requirement. The result of the MI was that an NDI FOL system could be procured. Bids were sent out in 1994 but all solicitations failed to meet the specifications. The FOL system specifications and Operational Requirements Document (ORD) were revised and a new solicitation was done. Raytheon won the bid and their system is now under testing.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- FRS

**Reference** (Smith et al., 2000):

Smith, F., Tubell, W., Rouse, J., Fujiwara, M., & White, D. (2000). System Evaluation Report (SER) for the Forward Repair System (FRS): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB261530.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

190300 - Combat Vehicles

Descriptors:

(U) \*REPAIR, \*TANKS(COMBAT VEHICLES), TEST AND EVALUATION, MAINTENANCE, SCENARIOS, FORWARD AREAS, BATTALION LEVEL ORGANIZATIONS, INFANTRY, TEAMS(PERSONNEL), MISSIONS, TEST VEHICLES, SYSTEMS ANALYSIS, ROADS

Identifiers:

(U) M-1A1 TANKS, M-2A2 VEHICLES, M-88A1 VEHICLES

**System Description:**

The FRS consists of a securable Palletized Load System (PLS) truck, flatrack mounted maintenance shop with 5.5-ton capacity crane, welding equipment, industrial quality power, and air and hand tools. It is designed to provide field level maintenance (unit and direct support) to mechanized forces. The FRS-H will be used to repair battle damaged and inoperable vehicles in the forward area and will have mobility characteristics equivalent to the supported force. The truck shall be capable of traveling to disabled heavy forces systems where a system has failed or a site chosen by the recovery section. The FRS-H will be capable of removing and replacing major components, including Full-up Power Packs (FUPPs). Because the FRS-H is a mission critical system, it will operate laterally and horizontally on the battlefield between

the supported Unit Maintenance Collection Points (UMCP) and at or near combat vehicle breakdown sites in the vicinity of the forward line of own troops (FLOT). It shall carry the tools, diagnostic equipment, and repair parts needed to return heavy forces systems to battle or into a self-recovery mode. Because the FRS-H is mission critical, nuclear, biological, and chemical (NBC) Contamination Survivability (NBCCS), High Altitude Electromagnetic Pulse (HAEMP) and Electromagnetic Environmental Effects (E3) survivability are required.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- GBS-TIP/TGRS

**Reference** (Mastromanolis et al., 2003):

Mastromanolis, N., Ireland, K., Rivera, E., Jones, M., Thompson, P., Manasco, C., Wieworka, T., Borrero, E., Watts, M., Davis, T., & Thompson, K. (2003). System Assessment (SA) for the Global Broadcast Service Transportable Ground Receive Suite and Theater Injection Point (GBS-TIP/TGRS): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB288447.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

250200 - Radio Communications

Descriptors:

(U) \*RADIO BROADCASTING, ELECTRONIC WARFARE, THEATER LEVEL OPERATIONS, SATELLITE COMMUNICATIONS, SYSTEMS ANALYSIS, TACTICAL COMMUNICATIONS, GLOBAL COMMUNICATIONS, ASYNCHRONOUS TRANSFER MODE, INFORMATION WARFARE

Identifiers:

(U) \*GBS(GLOBAL BROADCAST SERVICE), \*TGRS(TRANSPORTABLE GROUND RECEIVE SUITE), TIP(THEATRE INJECTION POINT)

**System Description:**

ARMY AREA OF CONSIDERATION WITHIN GBS SYSTEM.

**Theater Injection Point (TIP).** A TIP is a transportable GBS broadcast management and uplink system that provides Joint Force Commanders (JFCs) direct access to GBS and a means of transmitting large amounts of data to subordinate forces in-theater. A TIP consists of a TSBM and a Transportable Theater Injector (TTI). The TSBM crew operates in close coordination with the responsible Combatant Commanders' TIM to execute all TIP broadcasts. The TIP will provide in-theater information producers a path for video and data dissemination to in-theater warfighters by developing, building, and injecting theater-produced information directly to the satellite for broadcast to forces within a GBS coverage area. The TIP is built so that it can be mounted on two High Mobility Multi-Purpose Wheeled Vehicles (HMMWV). The TSBM provides the interface for data sources and consists of two security enclaves for the processing of classified data and unclassified video and data, simultaneously. The TSBM assembles the broadcast data stream based on resource allocations and information priorities and forwards the stream to the TTI for uplink. The TTI has the capability to operate in both Ka-band and Ku-band using a single antenna (although not both bands simultaneously). The TIP is capable of broadcasting on a single satellite transponder at a data rate of 12 megabits per second (Mbps) using a military satellite (Ka), and 23.5 Mbps using a commercial satellite (Ku).

**Transportable Ground Receive Suite (TGRS).** The TGRS is available to receive data from the GBS transmit segment. The TGRS consists of an RT and an RBM. The RT is the tracking receive antenna and the RBM is a portable computer in which broadcast data products are received and serves as the interface for the tactical end-user to the GBS system.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Generator- DPGDS MEP-PU-810B

**Reference** (Hamilton et al., 2002):

Hamilton, R. J., Alvarez, J., Barron, J., Cieslak, A., Walker, T. R., & Lenning, A. J. (2002). System Assessment (SA) for the Deployable Power Generation and Distribution System (DPGDS) MEP-PU-810B: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report # 22348710.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

**System Description:**

The DPGDS is an Acquisition Category (ACAT) III program designed to connect to existing elements of the secondary power distribution system to provide electrical power to an 1,100 person camp. The MEP-PU-810B is a wheel-mounted semi-trailer generator set that contains two 460 kW generator sets, with an integrated primary power distribution center capable of delivering 920 kW, 4160 V, 50/60 Hz total power. Control of the unit is accomplished through on-board control panels (typical for single-unit operation) or via a personal computer (PC) (typical for multi-unit operation). Up to four PPU's can be controlled from a single PC, and the PC can be located up to 1,500 feet from the units. Control of the single PPU or linked PPU plant is via an Operator Remote Terminal (ORT), which can be set in either automatic or manual modes of operation. Secondary Distribution Centers (SDC) are used to transform the primary high voltage power to low voltage (120/208) usable power and to begin the secondary distribution portion of the system.

Since the DPGDS is a FAR Part 12, modified commercial item, off-the-shelf Air Force Acquisition Program, the Air Force is the designated Acquisition Agency and the Prime Inventory Control Authority (PICA) for this program.

There are two configurations of the PPU, differing only in the undercarriage area. The MEP-PU-810A (Air Force model) is configured for low-speed maneuverability. The MEP-PU-810B (Army model) is configured with a "fifth wheel." Only the assessment of the MEP-PU-810B will be discussed in this report. All other references to the MEP-PU810B will be referred to as the DPGDS.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Generator- TQG 30/60 KW

**Reference** (Smith et al., 2001):

Smith, F., Tackett, S., Cieslak, A., Zwicke, R., & Barron, J. (2001). System Assessment (SA) for the Family of Tactical Quiet Generators (TQG) (30/60 KW): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. AEC, APG, MD. DTIC ADB266067.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:  
100200 - Electric Power Production and Distribution

**Descriptors:**

(U) \*PERFORMANCE(ENGINEERING), \*OPERATIONAL EFFECTIVENESS, \*GENERATORS, TEST AND EVALUATION, REQUIREMENTS, ARMY PERSONNEL, IMPACT TESTS, MAINTAINABILITY, RELIABILITY, ENDURANCE(GENERAL), ARMY EQUIPMENT, ENGINEERING, OPERATION, ENVIRONMENTAL TESTS, SYSTEMS ANALYSIS, ALTITUDE, NOISE(SOUND)

**Identifiers:**

(U) TQG(TACTICAL QUIET GENERATOR), FAT(FIRST ARTICLE TEST)

**System Description:**

The reengineered, digitized 30 and 60 kW TQG sets will be provided in both the skid-mounted and trailer-mounted power plant configurations. No new equipment or facilities will be required to support the digitized 60 or 30 kW TQGs. The sets are designed to provide a highly mobile and quiet power source and are multi-fuel capable (DF-1, DF-2, IP4, IP5, and IP8). The sets will have a low aural signature and will provide electric power for command, control, communications, and intelligence (C3I) systems, weapon systems, logistics support complexes, and medical support activities operated in a mobile field environment. The sets will consist of a diesel engine, brushless generator, governing system, 24-dc volt cranking system, control system, protection system, and other auxiliary components. The sets will have a document compartment, auxiliary fuel line, and manual frequency control. The sets are designed to be soldier-transportable.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Generator- TQG 100/200 KW

**Reference** (Lee et al., 1999):

Lee, I., Cieslak, A., Tackett, S., & Zwicke, R. (1999). System Evaluation Report (SER) for the 100 Kw and 200 Kw Tactical Quiet Generator (TQG) Sets: U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 92118095. DTIC ADB245434.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

**Fields and Groups:**

100200 - Electric Power Production and Distribution

150500 - Logistics, Military Facilities and Supplies

**Descriptors:**

(U) \*ELECTRIC GENERATORS, ACQUISITION, ARMY EQUIPMENT, SYSTEMS ANALYSIS, QUIET

**Identifiers:**

(U) TQG(TACTICAL QUIET GENERATORS), SER(SYSTEM EVALUATION REPORT)

**System Description:**

The 100/200 kW TQG sets will provide 120/208 volt and 240/416 volt, 3-phase alternating current (AC) electrical power. The 100/200 kW TQG sets will furnish electric power for command, control, communications, computer and intelligence (C4I) systems, weapon systems, logistics support complexes, and medical facilities. These systems will also provide a lower aural signature and equal to or greater reliability than the current Department of Defense (DOD) generator set family while using standard military coolants, lubricants, and fuels. Key features are digital controls and instrumentation and advanced diagnostics and prognostics. These sets will be supported through the DOD logistical system and the existing maintenance concept.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Generator- TQG 100/200 KW

**Reference** (Hall et al., 2004):

Hall, J. R., Dedrick, E., Foster, M., Cieslak, A., Barron, J., Hubner, M., Byrd, J., & Lenning, A. (2004). System Evaluation Report (SER) for the 100 Kw and 200 Kw Tactical Quiet Generator (TQG) Sets: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 41598957. DTIC ADB299486.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

100200 - Electric Power Production and Distribution

Descriptors:

(U) \*ELECTRIC GENERATORS, DIESEL ENGINES, LOGISTICS SUPPORT, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, ELECTRIC POWER, POWER EQUIPMENT, QUIET

Identifiers:

(U) EXPORT CONTROL, \*TACTICAL QUIET GENERATORS

**System Description:**

The 100/200-kW TQGs are tactical, diesel engine-driven power sources capable of multifuel operation that can operate on DF-1, DF-2, IP-4, IP-5, or IP-8 fuels. The 100/200 kW TQGs will provide three-phase electric power at 120/208-volt or 240/416-volt alternating current (AC) rated at a 0.8 power factor (pf) lagging. Output frequency is 50 hertz (Hz) or 60 Hz, selectable. The 100/200 kW TQGs consist of a turbo-charged, diesel engine, liquid-cooled power plant that drives an electric generator equipped with advanced onboard instrumentation, diagnostics, and prognostics. The systems include a digital generator set control system and electronic microprocessor controls that permits operation of multiple sets in parallel to support larger facilities or requirements. The 100/200 kW TQGs are enclosed in metal housing with baffles to reduce the aural signature and a cooling system to maintain the operating temperature and reduce thermal signature. The 100/200 kW TQGs are equipped with 24-volt direct current (DC) cranking and battery charging systems and North Atlantic Treaty Organization standard slave receptacles. The 100/200 kW TQGs will be available in two configurations, skid-mounted sets and trailer-mounted power units (PU).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Generator- TQG- 3KW

**Reference** (Tackett, 2000):

Tackett, S. (2000). System Evaluation Report (SER) for the 3-Kilowatt Tactical Quiet Generator (3kw TQG): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ECSTD, Ft. Hood, TX. DTIC ADB254480.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

100200 - Electric Power Production and Distribution

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*ELECTRIC GENERATORS, \*QUIET, TEST AND EVALUATION, COMMAND CONTROL COMMUNICATIONS, DIESEL ENGINES, LOGISTICS SUPPORT, WEAPON SYSTEMS, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, ELECTRIC POWER, POWER EQUIPMENT, MEDICAL SERVICES, DIESEL FUELS

Identifiers:

(U) EXPORT CONTROL, SER(SYSTEM EVALUATION REPORT), \*TQG(TACTICAL QUIET GENERATOR)

**System Description:**

The 3 kW TQG sets will be provided in both the skid-mounted and trailer-mounted power plant configurations. No new equipment or facilities will be required to support the 3 kW TQG. The set is designed to provide a highly mobile and quiet power source and will operate on diesel fuel. The sets will have a low aural signature and will provide electric power for command, control, communications, and intelligence (C3I) systems, weapon systems, logistics support complexes, and medical support activities operated in a mobile field environment. The sets will consist of a diesel engine, brushless generator, governing system, 24 volt dc cranking system, control system, protection system, and other auxiliary components. The sets will have a document compartment, auxiliary fuel line, and manual frequency control. The sets are desired to be soldier-portable with a wet weight not to exceed 325 pounds.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Grenade- Hand- LFHG XM96

**Reference** (Cross et al., 2001):

Cross, M., Zwicke, R., Abeyta, R., & Scott, D. (2001). System Evaluation Report (SER) for the XM96 Lightweight Fragmentation Hand Grenade (LFHG): U.S. Army Evaluation Center (AEC), Aberdeen Proving Ground, MD. Report #: 10438382. DTIC ADB263654.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*GRENADES, SURVIVABILITY, FRAGMENTATION, OFF THE SHELF EQUIPMENT, COMMERCIAL EQUIPMENT, LIGHTWEIGHT, HAND HELD

Identifiers:

(U) XM-96 GRENADES

**System Description:**

The U.S. Army has identified a need for a lightweight fragmentation hand grenade that lightens the Soldier's load, increases lethality, is designed with a non-degrading fuzing system, and reduces the probability of hazard to the operator. The LFHG will replace the current M67 Fragmentation Hand Grenade and supports the Army's combat, combat support, and combat service support mission functions.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to

Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458:

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**System Short Name:** SER- Grenade- Hand- Stun SHG XM84

**Reference** (Luedtke et al., 1998):

Luedtke, L., Romanko, T., Abeyta, R., & Heatwole, C. (1998). System Evaluation Report (SER) for the XM84 Stun Hand Grenade (SHG): U.S. Army Operational Test and Evaluation Comd., ATTN: CSTE-XXX-XXX, Part Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. USAEAC, APG, MD. Report #: 82647004 / SER 98-08. DTIC ADB238317.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*GRENADES, OUTPUT, TERRORISTS, METALS, HOSTAGES, RESCUES, INTENSITY, PRIMERS, MISSIONS, SAFETY, CLASSIFICATION, SYSTEMS ANALYSIS, ASSEMBLY, RINGS, PINS, PYROTECHNICS, HANDS, CRIMINOLOGY, FLASHES, BURSTING CHARGES, GRENADE FUZES

Identifiers:

(U) SHG(STUN HAND GRENADE), SER(SYSTEM EVALUATION REPORT), \*STUN HAND GRENADES, XM84 GRENADES, HE(HAND EMPLACED), \*NONLETHAL GRENADES

Identifier Classification:

**System Description:**

The XM84 SHG is a nonlethal (stun) diversionary handemplaced (HE) grenade, which produces an intense flash and bang. Tactical and nontactical forces will use the XM84 SHG during missions of hostage rescues, capture of criminals, terrorists, and other adversaries. The XM84 SHG has an M201A1 fuze and a pyrotechnic output charge in a synthetic casing. The XM84 SHG body consists of a nonfragmenting metal casing. The fuze has a percussion primer, spring-loaded striker, safety lever, ring assembly, safety pins, and a 1.5-second delay/separation charge. The XM84 SHG will be packaged and shipped with three grenades in an M19A1 metal container. The overpack consists of four M19A1 metal containers encased in a wood-wirebound box.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Grenade Launcher- 40mm- Cartridge- ANLM XM1112

**Reference** (Wallace et al., 2007):

Wallace, P., Smyers, P., Campbell, S., Sheng, S., Beran, G., & Sokolis, B. (2007). System Evaluation Report (SER) for the Milestone B of the 40mm, XM1112 Airburst Non-Lethal Munition (ANLM): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 731710003. DTIC ADB333054.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

120400 - Operations Research

150300 - Defense Systems

Descriptors:

(U) \*TEST AND EVALUATION, \*RISK ANALYSIS, \*NONLETHAL WEAPONS, METHODOLOGY, OPERATIONAL READINESS, AREA DENIAL, TECHNOLOGY ASSESSMENT, PROXIMITY FUZES, FLASHES, GRENADE LAUNCHERS, TIME DELAY FUZES

Identifiers:

(U) \*ANLM(XM1112 AIRBURST NON-LETHAL MUNITION), \*RISK ASSESSMENT

**System Description:**

The XM1112 will provide a standoff, non-lethal incapacitation capability to forces for a variety of tactical area denial applications and also for physical security/facility protection. The XM1112 ANLM Increment I will be fired from the M203 40mm Grenade Launcher. The robust flashbang effect at extended ranges of the XM1112 ANLM provides an important option that is currently missing from the non-lethal arsenal.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Grenade Launcher- 40mm- Cartridge- CC

**Reference** (Cross et al., 2000):

Cross, M., Oliver, S., Laughmann, R., Zwicke, R., Abeyta, R., & Maruyama, D. (2000). System Evaluation Report (SER) for the XM1001 40mm Canister Cartridge (CC): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA DTIC ADB257609.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

190600 - Guns

Descriptors:

(U) \*CANISTERS, \*CARTRIDGES, TEST AND EVALUATION, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, SYSTEMS ANALYSIS

Identifiers:

(U) EXPORT CONTROL, 40-MM CARTRIDGES

**System Description:**

The XM1001 40mm CC for the MK19 MOD3 GMG was identified as a Pre-Planned Product Improvement (P3I) in the Required Operational Capability (ROC) for the MK19 GMG. The cartridge will be used against ground troops in exposed positions, extremely rugged terrain, dense vegetation, military operations in urban terrain, and other tactical situations where use of other 40mm grenade explosive ammunition is limited for safety reasons. The 40mm CC conforms in shape, length, and weight to the standard highvelocity family of ammunition. When the primer of the case cartridge is ignited, propellant gas is bled into the base of the canister projectile through a hole in the bottom of the body. The force of the gas acting on the valve plate pushes it forward and opens the plenum chamber. In addition to the generation of this high-pressure gas, additional pressure is produced when this gas ignites 250 - 750 mg of WC231 propellant expulsion charge located in the plenum chamber. The highpressure gas produced by the burning of the expulsion charge acts to force the valve plate against the base of the sabot and pushes the pusher cup forward. The pusher cup is loaded with one hundred thirteen 17-grain flechettes. The forward motion of the pusher cup and the flechettes releases the nose cap by pushing it over the shear strip. Once the nose cap is released, the pusher cup and flechettes are free to deploy. No parts of the canister projectile are left in the bore of the MK19 Mod 3 GMG after firing. The 40mm CC is designed for ranges up to 100 meters.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Grenade Launcher- 40mm- Cartridge- CC

**Reference** (Smyers et al., 2006):

Smyers, P., Johnson, K., Zwicke, R., Scott, D., Aspinall, J., Ward, J., & Sokolis, B. (2006). System Assessment (SA) for the Produced in Support of a Materiel Release Decision for the Cartridge, 40mm, Canister, M1001: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB319645

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*AMMUNITION, \*CARTRIDGES, \*CANISTER PROJECTILES, FIRING MECHANISMS(WEAPON), PROJECTILES, ANTIPERSONNEL AMMUNITION, GUN MUZZLES, MUZZLE VELOCITY, FLECHETTES, NOSE CAPS, HIGH VELOCITY, MACHINE GUNS

**System Description:**

The M1001 conforms in shape, length (4.415 inches maximum), and weight (0.76 pound) to the standard high-velocity family of ammunition. It can be fired from the MK-19 MOD 3 Grenade Machine Gun (GMG) at a muzzle velocity of 790 feet per second and can provide effective anti-personnel capability to a maximum range of 100 m. The M1001 pusher cup is loaded with one hundred seven 17-grain flechettes. The pusher cup separates once the nose cap is released upon projectile muzzle exit, and the flechettes are then free to deploy. No parts are left in the bore of the MK-19 after firing.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Grenade Launcher- 40mm- Cartridge- CDC

**Reference** (Romanko et al., 1998):

Romanko, T., Heatwole, C., Abeyta, R., Laughman, R., & Ryan, M. C. (1998). System Evaluation Report (SER) for the Non-Lethal 40mm Crowd Dispersal Cartridge: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA DTIC ADB238866.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*CARTRIDGES, SURVIVABILITY, SMALL ARMS AMMUNITION, FIRING TESTS(ORDNANCE), OPERATIONAL EFFECTIVENESS, SYSTEMS ANALYSIS

Identifiers:

(U) RUBBER BULLETS, 40-MM CARTRIDGES, NONLETHAL AMMUNITION

**System Description:**

The CDC is an upgrade to the DEFTEC-37/40mm or "40-B" cartridge fired from standard civilian law enforcement tear gas grenade launchers. The upgrade consisted of a thinner cartridge base which is more compatible with the M203 ejection mechanism and the replacement of the black powder propellant with smokeless powder. The CDC is launched from the M203 grenade launcher mounted under either the M16 series rifle or the M4 series carbine. The cartridge contains 24 rubber spheres (0.6 caliber/inch diameter, 0.08 ounce) launched at muzzle velocity of approximately 97 meters per second with an impact velocity of about 80 meters per second at 10 meters range.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Grenade Launcher- 40mm- Cartridge- CDC

**Reference** (Cross and Maruyama, 2001):

Cross, M., & Maruyama, D. (2001). System Evaluation Report (SER) for the XM 1029 40mm Crowd Dispersal Cartridge (CDC): U.S. Army Evaluation Center (AEC), Aberdeen Proving Ground, MD. Report #: 10668406. DTIC ADB263945.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*CARTRIDGES, TEST AND EVALUATION, MILITARY REQUIREMENTS, SURVIVABILITY, ARMY PERSONNEL, SMALL ARMS AMMUNITION, FIRING TESTS(ORDNANCE), OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, SYSTEMS ANALYSIS, TEST FACILITIES, MISSOURI

Identifiers:

(U) CDC(CROWD DISPERSAL CARTRIDGE), 40mm CARTRIDGES, PQT(PRODUCTION QUALIFICATION TEST)

**System Description:**

The 40mm CDC is an upgrade to the DEFTEC-37/40mm cartridge fired from standard civilian law enforcement tear gas grenade launchers. The upgrades consisted of an improved polyurethane lacquer top seal, 48 balls wrapped with a paper sleeve, lacquer around the primer, a thinner cartridge case which is more compatible with the M203 ejection mechanism, and the replacement of the black powder with smokeless powders as the propellant. The CDC is launched from the M203 grenade launcher attached to the M16/M4 series weapons. The cartridge contains 48 rubber balls (diameter - 0.48 inch, weight - 0.08 ounce) launched with an effective range of 15-30 meters (threshold) and 1050 meters (objective).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Grenade Launcher- 40mm- Cartridge- Machinegun- Practice MK281

**Reference** (Fendick and Johnson, 2004):

Fendick, K., & Johnson, K. (2004). System Assessment (SA) for the MK281 Mod 0 40mm Practice Cartridge: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB302905.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)  
Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*HUMAN FACTORS ENGINEERING, \*TRAINING AMMUNITION, \*CARTRIDGES, LOGISTICS SUPPORT, DECISION MAKING, HAZARDS, FIRING TESTS(ORDNANCE), COMPATIBILITY, ARMY EQUIPMENT, SYSTEMS ANALYSIS, TRAJECTORIES, INSENSITIVE EXPLOSIVES, THERMAL SHOCK, SALT WATER

Identifiers:

(U) \*MK281 MOD 0 40mm PRACTICE CARTRIDGES

**System Description:**

The MK281 Mod 0 is a training round for the MK19 40mm Grenade Machinegun (GMG). It is intended to address environmental concerns with the current M918 training round. The MK281 Mod 0 contains no energetic materials and does not give rise to unexploded ordnance. The cartridge emits an orange cloud of dust upon impact, which provides the shooter and his observer a visible signature of the projectile impact point.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Grenade Launcher- 40mm- Cartridge- NLC XM1006

**Reference** (Romanko et al., 1999):

Romanko, T., Zwicke, R., & Abeyta, R. (1999). System Assessment (SA) for the XM1006 40mm Non-Lethal Cartridge: U.S. Army Test and Evaluation Command, Attn: CSTE-AEC-CC, Park Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB249724.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)  
Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*ACCEPTANCE TESTS, \*AMMUNITION, TEST AND EVALUATION, MATERIEL, SURVIVABILITY, ARMY PERSONNEL, PROPELLANTS, CYLINDRICAL BODIES, SYSTEMS ANALYSIS, TRAJECTORIES, SURVEILLANCE, PLASTICS, GRENADES, MUZZLE VELOCITY

Identifiers:

(U) EXPORT CONTROL, 40-MM CARTRIDGES

**System Description:**

The cartridge consists of a 40mm percussion-primed case containing standard propellant and a projectile made up of a plastic cylinder tipped with a sponge rubber hemisphere. The projectile weighs 29.9 grams (1.1 ounces). The XM1006 40mm NLC is intended for use with the M203 grenade launcher and is leaf-sight mounted on either the M4 carbine or M16A2 rifle. The sponge grenade has a muzzle velocity of approximately 85 meters per second (20 percent higher than tactical 40mm ammunition) and, therefore, has a different trajectory than tactical ammunition. This requires that soldiers select a point of aim different from those used for tactical ammunition on targets at ranges closer than 50 meters. A leaf sight designed specifically for the XM1006 40mm NLC was not developed for this test. Soldiers must therefore use "Kentucky windage" when firing the XM1006 40mm NLC at targets. The system is required to stop, confuse, disorient, and/or momentarily incapacitate targeted individuals not wearing protective vests, with

a probability of hit (P(h)) of 0.90 at 30 meters, 0.65 at 50 meters (objective), 0.85 at 30 meters, and 0.60 at 50 meters (threshold).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Grenade Launcher- 40mm- Cartridge- NLC XM1006

**Reference** (Luedtke et al., 1999):

Luedtke, L., Romanko, T., Zwicke, R., & Abeyta, R. (1999). System Evaluation Report (SER) for the XM1006 40mm Non-Lethal Cartridge: U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 92568131. DTIC ADB247399.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*FIRING TESTS(ORDNANCE), \*OPERATIONAL EFFECTIVENESS, \*AMMUNITION, \*CARTRIDGES, TEST AND EVALUATION, SURVIVABILITY, ARMY PERSONNEL, PROPELLANTS, CYLINDRICAL BODIES, SIGHTS, CLASSIFICATION, SYSTEMS ANALYSIS, TRAJECTORIES, PLASTICS, TEST FACILITIES, GRENADES, MUZZLE VELOCITY

Identifiers:

(U) XM1006 CARTRIDGES, 40-MM CARTRIDGES, NLC(NON-LETHAL CARTRIDGE)

**System Description:**

The cartridge consists of a 40-millimeter (mm), percussion primed case containing standard propellant, and a projectile made up of a plastic cylinder tipped with a sponge rubber hemisphere. The projectile weighs a total of 29.9 grams (1.1 ounce). The XM1006 40mm NLC is intended for use with the M203 grenade launcher and is leaf-sight mounted on either the M4 carbine or M16A2 rifle. The sponge grenade has a muzzle velocity of approximately 85 meters per second (20 percent higher than tactical 40mm ammunition) and, therefore, has a different trajectory than tactical ammunition. This requires that soldiers select a point of aim different than ones used for tactical ammunition on targets at ranges closer than 50 meters. Soldiers must use "Kentucky windage" when firing the XM1006 40mm NLC at targets. The system is required to stop, confuse, disorient and/or momentarily incapacitate targeted individuals not wearing protective vests, with a probability of hit (P(h)) of 0.90 at 30 meters; 0.65 at 50 meters (objective); 0.85 at 30 meters; 0.60 at 50 meters (threshold).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Grenade Launcher- 40mm- Cartridge- NLC-CS

**Reference** (Cross et al., 2000):

Cross, M., Oliver, S., & Maruyama, D. (2000). System Assessment (SA) for the 12 Gauge and 40mm Nonlethal Ammunition for Contingency Stockpile: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB257595.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*OPERATIONAL EFFECTIVENESS, \*AMMUNITION, \*STOCKPILES, \*CARTRIDGES, TEST AND EVALUATION, EMERGENCIES, SURVIVABILITY, ARMY EQUIPMENT, SYSTEMS ANALYSIS, TEST FACILITIES, BLUNT BODIES, TRAUMA, BAGS

Identifiers:

(U) EXPORT CONTROL, 40-MM CARTRIDGES

**System Description:**

Descriptions of each round type follow:

- 12 Gauge Bean Bag round. This is a blunt-trauma-producing nonlethal ammunition for the 12 Gauge Shotgun. The munition contains a bean bag that is propelled at the intended target.
- 12 Gauge Flash/Bang round. This is a diversionary device for the 12 Gauge Shotgun. It produces a loud bang and a flash about 10 meters from the muzzle.
- 40mm Ball. This is an area fire munition that fires a payload of rubber balls that disperse upon leaving the barrel.
- 40mm Foam Baton. This is an area fire munition that fires three foam batons.

The 12 Gauge Flash/Bang round is a diversionary device that is intended to distract and disorient persons in the discharge area. The other cartridges all produce blunt trauma to the body upon impact.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Grenade Launcher- 40mm- GLM XM320

**Reference** (Johnson et al., 2007):

Johnson, I., Fendick, K., Zwicke, R., Vegoda, R., Juba, A., Lloyd, T., Beran, G., Deng, G., Blankenship, C., Shelton, M., & Aarsen, T. (2007). System Evaluation Report (SER) for the XM320 Grenade Launcher Module (GLM): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 71519958. DTIC ADB327659.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190600 - Guns

Descriptors:

(U) \*GRENADE LAUNCHERS, LASER APPLICATIONS, SYSTEMS ANALYSIS, RANGE FINDING, SEMIAUTOMATIC WEAPONS, RIFLES, HAND HELD, NIGHT SIGHTS

**System Description:**

The XM320 GLM is a 40mm grenade launcher non- developmental item (NDI) produced by Hechier and Koch (H&K), which can be attached to the 5.56mm M4 MWS, 5.56mm M16A2/M16A4 semi-automatic rifles or used as a SA system. The United Kingdom and German military employ a very similar but not identical R&K launcher. The weapon's SA configuration and multi-host weapon attachment system will allow increased modularity and will enable units to better configure their weapons based on mission need. The 40mm GLM can be employed against point and area targets in defilade positions (for example, bunkers, rooms, and trenches). The XM320 is a single shot, break open weapon. The barrel opens by unlocking and swinging the breach to the left. The GLM has an unrestricted breach design, enabling capability growth by allowing the system to fire longer projectiles than possible with the current M203

system. The trigger of the XM320 is a double action only type and has an ambidextrous manual safety. The GLM is manually operated and is designed to fire all current U.S. standard low-velocity 40 x 46mm lethal and non-lethal munitions. Also, an NDI Day/Night Sight (DNS) is provided as part of the system. An earlier version of the DNS, termed the AN/PQS-18A, is being fielded under the Rapid Fielding Initiative (RFI). An H&K ladder sight for back-up and a commercial off-the-shelf (COTS) handheld Laser Range Finder (LRF) are also provided as part of the system.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Grenade Launcher- 40mm- Machine Gun Mount- MK64

**Reference** (Lewis and Wood, 1997):

Lewis, P., & Wood, G. (1997). System Assessment (SA) for the MK64 Mod 9 Machine Gun Mount for the 40mm MK19 Machine Gun: U.S. Army Evaluation Analysis Center., Aberdeen Proving Ground, MD 21005-3013. DTIC ADB232441.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

190600 - Guns

Descriptors:

(U) \*MOUNTING BRACKETS, \*GUN MOUNTS, WARFARE, ACCURACY, ENDURANCE(GENERAL), MACHINE GUNS, SMALL ARMS, AMMUNITION, SYSTEMS ANALYSIS, FRAMES, VEHICLES, ASSEMBLY, GRENADES, KITS, RETROFITTING, BAGS

Identifiers:

(U) MK64 GUN MOUNTS, MK93 GUN MOUNTS, M-2 GUN MOUNTS

**System Description:**

The MK64 Mod 9 Machine Gun Mount consists of the MK64 Mod 7 mount with the installation of a retrofit kit. Five new subassemblies are included in the retrofit kit; Travel Lock Assembly, Cartridge Catch Bag/Frame Assembly, Ammunition Bracket Handknobs, and, of most significance, the UPA. The UPA was specifically designed to be used on both the MK93 Mod 1 Dual Mount and the MK64 Mod 9. The Mod 9 corrects several deficiencies with the MK64 Mod 7 especially when using the MK19 40mm GMG. These improvements provide more freedom of movement of the weapon, improved accuracy, and eliminate interference between the mount, ammunition catch bags, and the vehicle. The MK64 Mod 7 was type classified in February 1995. In March 1995, the MK93 Dual Mount was type classified. PM Small Arms decided to product improve the MK64 mount with the MK175 Pintle Adapter from the MK93 to provide mounting capability on a wider range of vehicles. This improved design was designated the MK64 Mod 9. However, PM Small Arms found a way to further improve the mounting flexibility of the MK93 and the MK64 Mod 9 by replacing the MK175 Pintle Adapter with a new design referred to as the UPA. The PQT, as described in paragraph 1.3 was designed to demonstrate the safety, compatibility, and endurance of the UPA on both the MK93 and MK64 mounts.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Grenade Launcher- Cartridge- 66mm- Blunt Trauma Distraction  
XM98/XM99

**Reference** (Romanko et al., 1999):

Romanko, T., Knuckles, S. C., Zwicke, R. A., & Johnson, L. (1999). System Evaluation Report (SER) for the 66mm XM98 Distraction and XM99 Blunt Trauma Grenades/Cartridges: U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 92118097. DTIC ADB245387.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*GRENADES, \*CARTRIDGES, TEST AND EVALUATION

Identifiers:

(U) XM99 CARTRIDGE, XM98 CARTRIDGE, BLUNT TRAUMA

**System Description:**

The XM98 and XM99 cartridges leverage the M90 smoke grenade/cartridge design. The XM98/99 design uses the same propulsion base which contains the electrical firing contacts and holds the cartridge/grenade in the standard 66mm launcher as does the M7 LVOSS dispenser. The propulsion base contacts complete the electrical firing circuit for the electric match, which initiates the propulsion propellant. An aluminum tube or cartridge case/grenade sleeve with an end-cap seal is crimped to the propulsion base. Once initiated, the propellant propels a pusher plate and the three submunitions/grenades through the sleeve or cartridge which is left behind in the launcher. A hole in the center of the pusher plate and each submunition/grenade allows the launch propellant to push off the end-cap and to ignite all three pyrotechnic delays. The delays are designed to allow the submunitions/grenades to achieve maximum range and impact the ground before detonating. The XM98 distraction submunitions/grenades detonate with a large flash and loud bang shortly after impact. The XM99 blunt trauma submunitions/grenades also detonate after impact, with each munition projecting over 200 balls/pellets (0.4 gram, .32 caliber) in a circular pattern with a narrow vertical (perpendicular to cylindrical axis of submunition) spread so that impacts from ideally oriented submunitions are on the lower extremities rather than the face and eyes.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Grenade Launcher- Cartridge- 66mm- Blunt Trauma Distraction  
XM98/XM99

**Reference** (Fendick et al., 2001):

Fendick, K., Sigler, R., Simmons, D., Matthews, S., Fujiwara, M., & Sokolis, B. (2001). System Evaluation Report (SER) for the 66mm Non-Lethal Grenades: XM98 Distraction/XM99 Blunt Trauma: U.S. Army Evaluation Center (AEC), Aberdeen Proving Ground, MD. Report #: 12638558. DTIC ADB270335.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*GRENADES, ACCEPTANCE TESTS, PAYLOAD, PRODUCTION, SYSTEMS ANALYSIS, NONLETHAL AGENTS

Identifiers:

(U) 66-MM GRENADES, M-98 GRENADES, M-99 GRENADES

**System Description:**

The 66mm NL grenade design applies the basic M90 Smoke grenade design and modifies it by replacing the three smoke-generating canisters with three distraction or blunt trauma payloads. Both the XM98 Distraction and XM99 Blunt Trauma grenades use the same propulsion base as the M90 grenade which contains electrical firing contacts and holds the grenade in the 66mm grenade launcher. The propulsion base contacts complete the electrical firing circuit for the electric match, which initiates the propulsion propellant. Immediately above the propulsion base is a pusher plate and immediately above the pusher plate are the three canisters. The entire design is encapsulated in an aluminum tube sleeve, with a cap crimped on one end and the propulsion base swaged into the other end. Once initiated, the propellant propels the pusher plate and the three canisters through the grenade sleeve. Multiple holes in the pusher plate and a hole in each canister allow the launch propellant to push off the end cap and ignite the three pyrotechnic delays within the canisters. The delays are designed to allow the canisters to achieve maximum range and impact the ground before functioning.

The XM98 Distraction canisters function with an intense, brilliant flash and loud bang shortly after impact. The distraction grenade canisters will provide a visual and audio effect which will stop, confuse, disorient, and/or temporarily incapacitate targets. The XM99 Blunt Trauma canisters also function after impact, with each canister projecting approximately 140 balls (0.32 inch diameter, 0.4 gram, rubber-polyvinyl chloride) in a flat, circular pattern. The blunt trauma payload is intended to be projected from the canisters with a narrow vertical spread so that impacts from ideally oriented canisters are on the lower extremities rather than the face and eyes. (The balls are ejected from the sides of the canisters versus the top, thereby reducing the chance that balls projected from canisters resting on the top or bottom will hit the face of identified targets.) The XM99 grenade will deliver blunt trauma devices which will stop, confuse, disorient, and/or temporarily incapacitate the targets.

XM315. The XM315 is a modified version of the LVOSS M304 Installation Kit with the unique Adjustable Aiming Bracket. The XM315 allows the operator to choose one of three different settings (50m, 75m, 100m) to deliver the grenades. The XM315 Installation Kit allows the grenade launcher to be easily installed and removed, allowing flexibility of missions.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Grenade Launcher- Cartridge- 66mm- CS L96A1

**Reference** (Fendick et al., 2001):

Fendick, K., Sigler, R., Simmons, D., Matthews, S., Fujiwara, M., & Sokolis, B. (2001). System Assessment (SA) for the Grenade, Discharger: Anti-Riot, Irritant, CS, L96A1 and Grenade, Discharger: Anti-Riot, Practice, L97A1: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. AEC, APG, MD. Report #: 13028574. DTIC ADB272017.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*GRENADES, TEST AND EVALUATION, PERFORMANCE(ENGINEERING), OPERATIONAL EFFECTIVENESS, RELIABILITY, SAFETY

Identifiers:

(U) L96A1 GRENADES, L97A1 GRENADES, ANTI-RIOT GRENADES

**System Description:**

The L96A1 is an anti-riot grenade that dispenses CS. It is 66mm (2.6 inches) in diameter, 185mm (7.28 inches) long, and weighs 570 grams (1.25 pounds). It is composed of a glass-filled nylon propulsion base and a cylindrical rubber body that contains the payload. The propulsion base contains a gunpowder propellant charge, an electric match (fuze), and a gunpowder delay. The rubber body payload is 23 individually fuzed, light alloy canister submunitions filled with a CS compound. Each submunition contains a central perforation and is surrounded with cambric cloth (cloth impregnated with gunpowder). The cambric cloth is ignited by a piece of igniter cord that is assembled through the central perforation in each submunition and joined to the initiating charge at the base of the grenade.

The grenade is initiated by an electric match that receives current from the host vehicle's grenade launching system when the firing system is armed and the firing button is pressed. The clips attached to the end of the grenade's propulsion base make an electrical connection to the firing circuit when the grenade is loaded into the launcher tube and pushed onto the contact assembly at the base of the tube. The gunpowder propellant/ignition charge is ignited by the electric match. The gunpowder ignites the firing train inside the rubber payload body and releases sufficient energy through the blowout hole in the propulsion base to project the grenade out of the discharger tube to a distance of 65 to 95 meters. The delay detonator ensures the grenade bursts in the air over the target area at a height of at least 6 meters. The grenade does not contain an explosive bursting charge. The rubber body is ruptured by the pressure created from the burning igniter cord/cambric, scattering the already-burning 23 submunitions over a radius of approximately 25 meters. The submunitions provide numerous CS sources rather than a single plume. Area coverage is rapid and the grenade cannot be smothered or thrown back. The submunitions issue CS for approximately 8 seconds. This produces a cloud of agent for 10 to 12 seconds.

The L97A1 is a training version of the L96A1. It uses CA instead of CS to produce a training smoke. The L97A1 is an improved version of the LI4 training grenade that is standard issue in the armed forces of the UK. Both the L96A1/L97A1 can be fired from any 66mm discharger. They are planned for use with the XM315, which is a modification of the M7 Light Vehicle Obscuration Smoke System (LVOSS) launching system. The XM315 is planned for type classification in September 2001 and materiel release in December 2001.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- GSTAMIDS

**Reference** (Winslow et al., 1998):

Winslow, G. P., Swiger, A., & Tate, K. (1998). System Evaluation Report (SER) for the Ground Standoff Minefield Detection System (GSTAMIDS) Program Definition and Risk Reduction (PDRR) Phase: Advanced Technology Demonstration (ATD) of the Vehicle-Mounted Mine Detector (Vmmd) U.S. Army Operational Test and Evaluation Comd., ATTN: CSTE-XXX-XXX, Part Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. USAEAC, APG, MD. Report #: 90117052 / SER 11-98. DTIC ADB240748.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

150606 - Land Mine Warfare

Descriptors:

(U) \*MINE DETECTORS, STANDOFF, MANUFACTURING, RISK, SURVIVABILITY, DEMONSTRATIONS, MINEFIELDS, OPERATIONAL EFFECTIVENESS, REDUCTION, MOUNTS, SYSTEMS ANALYSIS, ANTITANK MINES

Identifiers:

(U) VMMD(VEHICLE MOUNTED MINE DETECTORS)

**System Description:**

GSTAMIDS is a teleoperated, vehicle-mounted, metallic and nonmetallic mine detector and marking system. It is envisioned that the fielded system will consist of a set of mine detection sensors mounted on a ground vehicle together with a controller vehicle and that each controller vehicle will contain a processor and a user interface to provide both visual and audible cues to the operator. The system is expected to contain a processor with a detection algorithm capable of discriminating mines without the operator "in-the-loop." In addition, both physical and electronic marking features will be included to permit follow-on forces to locate, avoid, or destroy detected mines. Primary missions will include detecting minefields for reconnaissance forces, preceding convoys (both on-road and limited cross-country) to protect following vehicles, and detecting the leading edges of minefields for breaching teams. Common features include:

- Three-meter-wide detection coverage.
- Integrated global positioning system (GPS).
- Physical marking of detection locations.
- Electronic storage of detection locations/geolocation of detections.
- Automatic target recognition (ATR) algorithms.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- GSTAMIDS

**Reference** (Tackett, 2003):

Tackett, S. (2003). System Evaluation Report (SER) for the Ground Standoff Minefield Detection System, Future Combat Systems (GSTAMIDS-FCS) / Abbreviated (ASER): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report # 32728870.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)  
FCS; mine; countermine

**System Description:**

The GSTAMIDS development program began in 1997. Because of the significant technological challenges, a spiral development and acquisition approach was adopted. The GSTAMIDS Block 0 was intended to provide a near-term capability by capitalizing on the Vehicle Mounted Mine Detection Advanced Technology Demonstration program. GBSTAMIDS Block 1 was to provide a system that met all of the objective requirements. However, the advent of the Army's Objective Force Transformation brought new mine countermine requirements. The new mine-countermine requirements made the Block 0 system obsolete, and the program was terminated. The GSTAMIDS Block 1 program was restructured to meet the FCS requirements and is now called GSTAMIDS-FCS.

The conceptual GSTAMIDS-FCS subsystem consists of primary mine detection sensors, a confirming sensor, a mine marking subsystem, and a neutralizer subsystem configured on MULE type III unmanned ground vehicle (UGV) platforms, plus an airborne mine detection sensor subsystem as a payload on the FCS Objective Aerial Vehicle (OAV). The sensor(s) for the OAV will provide regions of interest (ROIs) that are used to cue the ground-vehicle based sensors on the MULES. The type III MULES are directed to the ROJ and use the onboard sensors to detect, confirm, and mark mines within the ROJ. The neutralizer subsystem will then interrogate the marks and neutralize the mines in place.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

**System Short Name:** SER- Heater- SHA

**Reference** (Lee et al., 1999):

Lee, C.-L. C., Finkel, M., & Walker, J. (1999). System Assessment (SA) for the Space Heater Arctic (SHA) (Material Release): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. DTIC ADB248591.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

130100 - Air Condition, Heating, Lighting & Ventilating

Descriptors:

(U) \*SPACE HEATERS, TEST AND EVALUATION, ACCEPTANCE TESTS, MATERIEL, DECISION MAKING, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, RELEASE, USER NEEDS, SYSTEMS ANALYSIS, TENTS, ARCTIC REGIONS, COLD WEATHER TESTS, PRODUCTION MODELS

Identifiers:

(U) \*SA(SYSTEM ASSESSMENT), \*SHA(SPACE HEATER ARCTIC), FAT(FIRST ARTICLE TEST), PDM(PRODUCTION DEMONSTRATION MODEL), PQT(PRODUCTION QUALIFICATION TEST)

**System Description:**

The SHA is a lightweight, portable, multifueled, nonpowered space heater intended to heat the 5- and 10-man arctic tents. The heater provides radiant heat and natural convective heated air without the use of electrical power. The heated air is circulated by using a TEF mounted on top of the SHA. The TEF has a built-in thermoelectric module that converts heat from the heater into electricity to power the fan up to 700 revolutions per minute to blow air downward over the heater to the floor of the tent. The SHA has the capability to burn a range of liquid fuels as well as wood and coal. The SHA will overcome the safety and operational deficiencies which exist with the M41 and Yukon space heaters. These deficiencies, which include poor combustion of diesel fuel creating excess soot and smoke and the exposure of a pool of raw liquid fuel during operation, place the M41 and Yukon tent heaters ninth on the Army Materiel Command's list of the top 20 injury producers. The SHA provides a maximum heat output of 28,000 Btu, with a high/low adjustment capability and the ability to adjust for varying fuel viscosities under extreme temperatures. A standard military 5-gallon fuel can serves as an external fuel tank. The fuel is routed to the heater using the standard military gravity feed adapter supplied with the heater. During operation, the fuel can is inverted and placed on the military fuel can stand.

The SHA utilizes a vaporizing S-tube burner technology. The S-tube technology is intended to overcome the serious safety and operational deficiencies existing in the current US Army tent heaters by providing complete vaporization of fuels without exposure to raw fuel during operation. The S-tube vaporizing burner overcomes these deficiencies while maintaining low cost, simplicity, ruggedness, and standardization of components for Army tent heaters.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Heater- SHC-60K

**Reference** (Streilein, 2005):

Streilein, J. J. (2005). System Evaluation Report (SER) for the Space Heater Convective (SHC) 60,000 British Thermal Unit (60k BTU) (SHC-60k) Type Classification Standard/Full Rate Production (TC-STD/FRP) Decision/ Abbreviated (ASER): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB317308.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

130100 - Air Condition, Heating, Lighting & Ventilating

Descriptors:

(U) \*OUTPUT, \*SPACE HEATERS, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, HEATING, SAFETY, STANDARDS, THERMOELECTRIC POWER GENERATION

Identifiers:

(U) SHC(SPACE HEATER CONVECTIVE), FORCE AIR HEATING, SUITABILITY

**System Description:**

The SHC-60K was designed and developed as a Pre- Planned Product Improvement follow-on effort to the SHC-35K. The SHC-60K provides increased heat output (35,000 to 60,000 Btu) with minimal increase in size, weight, and cost to the SHC-35K. The SHC-60K utilizes the same proven thermoelectric power generation technology as the SHC-35K, but with design improvements and enhancements. The SHC-60K provides the capability to provide heated air to warm Soldiers safely and efficiently across the operational continuum in basic, cold, and extreme cold environments. The SHC-60K is operable in all cold weather conditions including snow, rain, and wind.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Heater- SHS

**Reference** (Walker et al., 2001):

Walker, J., Juber, A., Fujiwara, M. M., Chan, C., & Hall, J. (2001). System Evaluation Report (SER) for the Space Heater Small (SHS): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 20158598. DTIC ADB274409.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

130100 - Air Condition, Heating, Lighting & Ventilating

Descriptors:

(U) \*HUMAN FACTORS ENGINEERING, \*COLD WEATHER TESTS, \*SPACE HEATERS, TEST AND EVALUATION, ARMY RESEARCH, ARMY PERSONNEL, COMBAT SUPPORT, FIELD TESTS, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, GERMANY, TENTS, ARMY OPERATIONS, DIESEL FUELS

Identifiers:

(U) SHS(SPACE HEATER SMALL)

**System Description:**

The SHS is a 12,000 BTU/hr heater that is designed to provide heat for the SCT (a five-man tent) and other tents with floor area between 80 and 100 square feet, satisfying a requirement for small military tents that is currently not met. The SHS operates without the use of electrical power, can burn all types of diesel fuel, and utilizes a new vaporizing S-tube burner technology, which overcomes major combustion and safety problems that have existed over the past 50 years in the nonpowered heater industry. These problems include smoky combustion of diesel fuel and the hazardous exposure of a pool of raw fuel during operation. The vaporizing S-tube burner technology eliminates these deficiencies while still maintaining simplicity, ruggedness, and low cost. The SHS measures approximately 14 x 9x 16 inches and weighs 27 pounds, with accessories.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Helmet- MICH

**Reference** (Long et al., 2001):

Long, J., Bell, T., Richardson, L., Carley, P., Chan, F., Bretcher, J., & Moore, K. (2001). System Evaluation Report (SER) for the Modular Integrated Communications Helmet (Mich): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. DTIC ADB266341.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*HELMETS, \*SPECIAL OPERATIONS FORCES, TEST AND EVALUATION, MATERIEL, INTEGRATED SYSTEMS, IMPACT, SURVIVABILITY, FRAGMENTATION, ARMY FACILITIES, MODULAR CONSTRUCTION, OPERATIONAL EFFECTIVENESS, PROTECTION, RELEASE, NAVAL OPERATIONS, COMMUNICATION AND RADIO SYSTEMS, SYSTEMS ANALYSIS, NIGHT VISION, NORTH CAROLINA, HEARING, STREAMS, HEADGEAR

Identifiers:

(U) MICH(MODULAR INTEGRATED COMMUNICATIONS HELMET)

**System Description:**

The MICH is a single, modular headgear that provides ballistic, fragmentation, aural and impact protection, while being night vision, communications and Nuclear, Biological and Chemical (NBC) equipment compatible. The headgear assembly allows for mission essential components to be added or removed as necessary. The MICH Communications Package may be worn alone or under the helmet and uses an unobtrusive microphone/sound transmission system, a headset that attenuates sounds in excess of a predetermined threshold (High Noise Headset), and a Push-To-Talk (PTT) box that also provides interface connections for up to two radios, intercoms, or both. The MICH is designed to enable the operator to monitor single or multiple radios/intercoms and transmit on the selected frequency while using SOF radios and platform intercom systems.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- HENLM

**Reference** (Johnson et al., 2005):

Johnson, K., Zirhut, M., Beran, G., Blankenship, C., Thomas, S., Sury, M., Tovar, G., Hilliker, C., & Lloyd, T. (2005). System Evaluation Report (SER) for the Milestone B of the Hand Emplaced Non-Lethal Munition (HENLM): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA DTIC ADB315376.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

**Fields and Groups:**

150300 - Defense Systems

150607 - Unconventional Warfare

**Descriptors:**

(U) \*INCAPACITATING AGENTS, \*NONLETHAL WEAPONS, TEST AND EVALUATION, RISK ANALYSIS, INFRARED DETECTORS

**Identifiers:**

(U) PIR(PASSIVE INFRARED)

**System Description:**

The HENLM contains two independent Passive Infrared (PIR) trigger sensors and Taser® circuits. The 'fixed' (staring) PIR sensors in the head act as invisible tripwires. This allows a single HENLM to engage two different targets (simultaneously or at different times). These two independent shots can be oriented between 180 degrees and 5 degrees apart (in azimuth) to maximize the probability of engagement. Estimated range of the baseline HENLM is 20 feet. An individual crossing both fields of view of the PIR triggers the release of a pair of darts. Once in place, low energy, repetitive electrical pulses override the brain's signals to the individual's motor control system. The attachment of darts that result in electro-muscular disruption do not have to make contact with the individual's skin to generate an effect and are capable of jumping a collective gap up to 2 inches between the dart and skin. Individuals are effectively incapacitated for as long as the voltage is applied, but they are expected to remain conscious.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- HSTAMIDS

**Reference** (Smyers et al., 2000):

Smyers, P., Clark, M., Brabson, G., Flory, T., Abeyta, R., King, R., Mallamo, J., Reinhart, J., Addison, C., & Powell, S. (2000). System Evaluation Report (SER) for the Handheld Standoff Mine Detection System (HSTAMIDS) (Milestone II Decision). U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. DTIC ADB258490.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

**Fields and Groups:**

150606 - Land Mine Warfare

**Descriptors:**

(U) \*STANDOFF, \*LAND MINES, \*HAND HELD, \*METAL DETECTORS, TEST AND EVALUATION, INTEGRATED SYSTEMS, MANUFACTURING, RISK, SURVIVABILITY, FEASIBILITY STUDIES, SYSTEMS ANALYSIS, GROUND PENETRATING RADAR

**Identifiers:**

(U) SER(SYSTEM EVALUATION REPORT), \*HSTAMIDS(HANDHELD STANDOFF MINE DETECTION SYSTEM), E-PDRR(EXTENDED-PROGRAM DEFINITION AND RISK REDUCTION)

**System Description:**

**HSTAMIDS** is a lightweight, handheld mine detector designed to detect on- and off-road metallic and low-metallic mines. It presents the operator with audible signal cues when a potential mine detection occurs. Dismounted soldiers will use it to detect and locate AT and AP mines. The detection sensors are encased in a search head positioned at the end of a variable length wand that can be adjusted to allow the operator to sweep the ground from either a standing or prone position. The power supply and the signal processor for sensor data inputs are contained in a backpack worn by the operator. It also contains the computer electronics necessary to perform all of the control functions for operating the system and providing the audio signals to the system operator. The detector search head contains a metal detection

sensor coil and three GPR antenna sensors. The three GPR antennas, each about 3 inches in diameter, are mounted collinearly inside the oval metal detection coil. The center GPR antenna emits radio frequency signals, while the two outside antennas serve as receivers. The entire search head is about 10 inches long by 4 inches wide.

**Metal Detection Sensor.** The metal detection sensor is a search head metal detection sensor coil used in standard, off-the-shelf Minelab handheld mine detection systems. It has been slightly modified for use in the HSTAMIDS search head to permit physical integration with the GPR antennas while minimizing interference between the sensors. The metal detection sensor is a pulsed-induction type metal detection sensor coil, which provides audible cues to the operator when the search head comes in proximity to a metallic object. It produces a constant audio tone that varies in intensity directly proportional to the signal strength, gaining in intensity as the search head is moved closer to a metallic object and decreasing in intensity as the search is moved away from a metallic object.

**GPR Sensor.** The GPR sensor is a frequency-stepped continuous wave radar. The frequency packet consists of 96 frequencies ranging between 1 and 2.2 GHz, which are radiated from the center transmit antenna. The two receive antennas alternately collect the reflected energy of these frequencies and digitize it into in-phase and quadrature (I and Q) responses for each frequency. The frequency packets are radiated at a rate of 210 Hz. The GPR algorithms compute the signal strength from the I and Q responses, and produce an audible signal cue to the operator whenever a predetermined threshold is exceeded. The intensity of the audible cue does not vary with the signal strength intensity, rather it simply indicates that a threshold level has been exceeded.

**Headset.** The headset used for the prototype HSTAMIDS was a standard, commercial headset as can be found in any department store. Basically, it consists of a headband with an earmuff on each side containing a speaker which is placed over the ear. Headsets of this type are incompatible with the wear of the standard Personnel Armor System for Ground Troops (PASGT) helmet. However, according to a system contractor representative, this headset is intended for use only on the prototype system during the E-PDRR. The system contractor plans to change the headset to one which is compatible with the PASGT helmet during EMD. There are no special requirements for the HSTAMIDS headset; that is, the HSTAMIDS will work with any commercial off-the-shelf type headset.

**System Operation.** The HSTAMIDS processes returned signals from the metal detector and GPR sensors. To assist the operator, processing algorithms are applied to the GPR sensor signal data to reduce false alarms and increase the probability of mine detection. However, the successful operation of the HSTAMIDS is heavily dependent on the man-in-the-loop usersystem interface. That is, the HSTAMIDS does not declare whether or not an object it detects is a landmine. It only provides the operator audible signal cues which the operator must then

As a critical component of system performance, the HSTAMIDS training and skills development program are essential elements of the program success. Various mine types produce recognizable audible signal patterns that the operator must learn to distinguish from clutter and noise. Once trained on the basic operation of the system, the system operator must develop the skill to operate the system through intensive hands-on training. While the time to develop the skills required to successfully operate the HSTAMIDS varies widely according to the ability of individuals, it is clear that the longer a person practices operating the system, the better they become. However, complete concentration and focus on the signal cues on the part of the operator is a must since it is up to the operator to locate the mines using HSTAMIDS as the tool. As a critical component of system performance, the HSTAMIDS training and skills development program are essential elements of the program success. Various mine types produce recognizable audible signal patterns that the operator must learn to distinguish from clutter and noise. Once trained on the basic operation of the system, the system operator must develop the skill to operate the system through intensive hands-on training. While the time to develop the skills required to successfully operate the HSTAMIDS varies widely according to the ability of individuals, it is clear that the longer a person practices operating the system, the better they become. However, complete concentration and focus on the signal cues on the part of the operator is a must since it is up to the operator to locate the mines using HSTAMIDS as the tool.

Equally important to understanding HSTAMIDS system operation is to keep in mind that the sensors are not actually looking for and detecting landmines. The metal detection sensor is merely looking for metallic objects, while the GPR sensor functions as an anomaly detector. The target detection algorithm constructs a historical model of the GPR response in the local environment. Current samples are compared to the model, and a measure of the current sample's statistical behavior relative to the radar's response is made. It is this measure of the magnitude of the anomalous behavior which must cross the threshold before an alarm signal would be generated to cue the operator to the potential presence of a

mine. The algorithms also take into account known signal responses for known signature characteristics of various types of mines. However, the signal responses are dynamic variables which are influenced greatly by many other variables such as soil type, ground moisture, vegetation cover, etc. While the signature characteristics of various mine types are static, they can be easily masked by the vast fluctuations in signal response caused by terrain and environmental conditions. Therefore, to successfully find mines, the signal processor must be able to filter out the terrain and environmental influences on the signal responses in order to examine the actual signature characteristics of the object being detected.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- HSTAMIDS

**Reference** (Bamsch et al., 2003):

Bamsch, A. W., Mallamo, J., Meirose, S., Catalano, E., Brumlow, D., Walker, T., & Tackett, S. (2003). System Evaluation Report (SER) for the AN/PSS-14, Handheld Standoff Mine Detection System (HSTAMIDS): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 33398890.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

**System Description:**

The HSTAMIDS is a lightweight, handheld mine detector that can detect on- and off-road high metallic (M) and low-metallic (LM) mines. Dismounted soldiers will use it to detect and locate anti-tank (AT) and anti-personnel (AP) mines. It will present the user with audible signals when a potential mine detection occurs. It incorporates two sensor technologies; metal detector (MD) and ground penetrating radar (GPR). The MD and GPR sensors are encased in a search head positioned at the end of a variable length wand so that the operator can sweep the ground from an upright, kneeling, or prone position. The power-supply and signal-processor for sensor data inputs are contained in a small box.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- I-FLIR

**Reference** (McGuire et al., 2000):

McGuire, G., Vegoda, R., Brabson, G., Myers, J., & Winters, J. (2000). System Evaluation Report (SER) for the Improved-Forward Looking Infrared (I-FLIR): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 03088326. DTIC ADB256738.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

170501 - Infrared Detection and Detectors

Descriptors:

(U) \*FORWARD LOOKING INFRARED SYSTEMS, SURVIVABILITY, PERFORMANCE(ENGINEERING), TARGET ACQUISITION, OPERATIONAL EFFECTIVENESS, MAINTAINABILITY, INFRARED IMAGES, SYSTEMS ANALYSIS, FOCAL PLANE ARRAYS

**System Description:**

The I-FLIR capability is provided by inserting second generation thermal technology into selected combat systems. The heart of the system is the NV80 B-Kit which consists of infrared (IR) optics, an IR focal plane array detector, and associated analog and digital electronics. This B-Kit is common across a variety of host vehicle applications and modifications to the host vehicle fire control systems necessary to accept the BKit are referred to as the A-Kits, which include such items as head assembly, displays, interface electronics, brackets, and connectors. Each A-Kit is unique to the platform type involved.

**1.4.1 NV-80 B-Kit.** The NV-80 B-Kit is an integrated assembly of IR-imaging components for the sights. It consists of two major pieces: the sensor unit (SU) and common electronics unit (EU). A detector/cooler assembly will be utilized, which includes a two-dimensional focal plane array and a cryogenic cooler. Two afocal subassembly versions will be provided: the Dual-FOV Afocal version (for BFVSA3, MIA2) and the Relay Afocal version (for LRAS3). Figure 1-3 shows all the components of the B-Kit. The B-Kits will be furnished to the BFVSA3 IBAS, the BFVSA3 CIV, and the LRAS3 development programs. Sights, consisting of a B-Kit and necessary A-Kit items, will be developed for the MIA2 Abrams Thermal Imaging System (TIS) and the MIA2 CITY.

**1.4.2 Software.** The developmental software will be Ada-based and be in compliance with Department of Defense (DoD) Directive 3405.1, "Computer Programming Language Policy" (2 April 1992), DoD-STD-2167A, and DI-MCCR-81005A. Developmental and configuration items will have 50 percent reserve in input and output (I/O) throughput and channels with a 100 percent growth in throughput speed and memory expansion capability. Software interfaces will include radios, combat identification, battlefield digitization, etc.

**1.4.3 Interfaces.** The I-FLIR will be a replacement for the First Generation FLIR on several weapon systems. The I-FLIR program is currently undergoing parallel development in the BFVSA3 IBAS and will be used in the CIV. It will replace the present FLIR in the M1A2 TIS and the CITY. The I-FLIR will be used in the sight for the LRAS3.

**1.4.3.1 BFVSA3 IBAS and CIV.** The IBAS is the fire control system for the TOW missile and the 25-millimeter cannon on the BFVS vehicle. The I-FLIR development program will provide I-FLIR B-Kits to the BFVSA3 IBAS sights for the BFVSA3 fleet. In addition, the CIV will be fitted with an I-FLIR.

**1.4.3.2 M1A2 TIS and CIV.** The I-FLIR sight will replace the current TIS on the M1A2 GPS. The line replaceable units (LRUs) to be replaced are the thermal receiver unit (TRU), thermal electronics unit (TEU), image control unit (ICU), and the power control unit (PCU). The First Generation CITY provides a hunter/killer capability for the M1A2 commander. The I-FLIR program will replace the CITY with a Second Generation FLIR. The CIV electronics assembly and sight assembly will be replaced or modified.

**1.4.3.3 LRAS3.** The LRAS3 will provide a long-range surveillance and targeting I-FLIR for the Army scout.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- INE

**Reference** (Matricciani et al., 2004):

Matricciani, G., Pfoutz, M., Rivera, M., Bruder, B., Markham, W., Powell, M., Barnes, M., Pliscof, M., Hink, W., & Babicki, K. (2004). System Assessment (SA) for the Sectera KG-235 Inline Network Encryptor (INE): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB306890.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

120800 - Computer Systems Management and Standards

120900 - Cybernetics

250300 - Non-radio Communications

Descriptors:

(U) \*COMMUNICATIONS NETWORKS, \*INFORMATION SECURITY, TEST AND EVALUATION, DECISION MAKING, CRYPTOGRAPHY, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, LOGISTICS

Identifiers:

(U) \*ENCRYPTION, \*ENCRYPTORS, \*SECTERA KG-235 INLINE NETWORK ENCRYPTOR, INE(INLINE NETWORK ENCRYPTOR), SA(SYSTEM ASSESSMENT), DT(DEVELOPMENTAL TEST), CT(CUSTOMER TEST), UFD(USER FUNCTIONAL DESCRIPTION), SUITABILITY

**System Description:**

The Sectera INE is a Commercial Off-the-Shelf (COTS) Type 1 certified INE. Sectera supports Internet Protocol (IP)/Ethernet operation over standard commercial or tactical military networks. It provides confidentiality, data integrity, peer identification, authentication and mandatory/discretionary access control services. The Sectera consists of a Key Storage Device (KSD-64A) key fill device/Cryptographic-Ignition Key (CIK), a Default User Private Split (DUPS) KSD-64A and an INE Configuration Manager (CM-5000/6000). The CM-6000 provides for remote management of INEs within the network, and the CM-5000 provides local configuration of the Sectera. The fielded configuration will include Release 3.1 Software that implements High Assurance Internet Protocol Interface Specification (HAIPIS) compliance, Tactical Local Area Network Encryptor (TACLANE) interoperability, Pre-Placed Key (PPK), DS-101 interface and a series of enhancements for traffic flow security, auto discovery and FIREFLY updates. The Sectera INE is the next generation INE developed by General Dynamics and will replace the Network Encryption System (NES), which is used within the Combat Service Support (CSS) community to pass encrypted logistical data to users in that network architecture.

The Sectera INE is primarily keyed using DUPS key and FIREFLY Key Technology. Both are stored on KSD-64A or PKA64KC keys, and operate in the key receptacle of the Sectera INE's control panel. The vendor supplies the DUPS key that initializes the Sectera INE. The National Security Agency's (NSA) Electronic Key Management System supplies the FIREFLY key and contains a non-forgettable certificate with the Sectera INE's identity and security classification. The operator fills the FIREFLY keys directly into the INE at which time the KSD-64A converts into a CIK. Data encryption is achieved on a Traffic Encryption Key (TEK), which is generated between two communicating INEs because of the FIREFLY key exchange.

The INE Configuration Manager (CM) performs database management and utility functions. It stores network configuration information and application software for each Sectera and current NES units. The CM distributes the network configuration information and software, updates electronically over the network to each Sectera INE or via diskettes for current NES stations. The CM application provides for 'BACKUP/RESTORE' capability, which creates a copy of the database that can be stored in a desired file location or transferred to alternate storage media or INE sites.

Sectera operations require personnel assignments for both a Network Administrator (NA) and a Security Administrator (SA). The NA is responsible for net planning within the domain and generation of FIREFLY credentials. In addition, the SA is responsible for maintaining, monitoring and controlling INE security functions and is the interface between the NA and Communications Security (COMSEC) custodian. The SA, NA or COMSEC Custodian may be the individual who fill and initialize the INE CIKs.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- IRB

**Reference** (Clark et al., 2003):

Clark, M., Dillen, M., Fujiwara, M., Merchant, D., & Foster, M. (2003). System Evaluation Report (SER) for the Improved Ribbon Bridge (IRB): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 32248847. DTIC ADB291856.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

130200 - Civil Engineering

130600 - Surface Transportation and Equipment

Descriptors:

(U) \*MILITARY BRIDGES, TEST AND EVALUATION, SIMULATION, INTEGRATED SYSTEMS, DECISION MAKING, SYSTEMS ANALYSIS, MILITARY TRANSPORTATION, PONTOONS, FLOATING BODIES, SUPERSTRUCTURES, RISK MANAGEMENT

Identifiers:

(U) \*IRB(IMPROVED RIBBON BRIDGE), SER(SYSTEM EVALUATION REPORT), M16 IRB RAMP BAY, M17 IRB INTERIOR BAY, ALUMINUM BRIDGE, TRANSPORTERS, RAFTS

**System Description:**

The IRB system is a continuous floating, modular, aluminum bridge/raft with integral superstructure and floating support whose modules are transported, launched, and retrieved with a common bridge transporter. The IRB system consists of two types of modules, ramp bays and interior bays, that are connected together to form a floating bridge or raft. Each bay element is formed of two roadway and two bow pontoons. A raft is constructed of two ramp bays and the number of interior bays necessary to provide a safe margin of buoyancy and stability for applied loads.

A bridge is constructed by joining the number of interior bays required to span a given wet gap, with approach and departure ramps positioned at both shores. When launched, the hinged pontoons unfold to form a roadway that is then maneuvered into position with other bays for assembly, by Bridge Erection Boats (BEB). The CBT with BAP individually transports IRB bays. The bridge is anchored in strong currents using a supplementary set (SC) that consists of rope, cabling, and hardware to provide anchorage.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- IVMMD-ST5

**Reference** (Winslow et al., 2001):

Winslow, G., Addison, C., Faker, D., Swiger, A., & Landy, K. (2001). System Evaluation Report (SER) for the Interim Vehicle-Mounted Mine Detector Standard Teleoperation System (IVMMD-ST5): U.S. Army Evaluation Center (AEC), Aberdeen Proving Ground, MD. Report #: 11138440. DTIC ADB265308.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

150606 - Land Mine Warfare

Descriptors:

(U) \*MILITARY VEHICLES, \*MINE DETECTORS, SURVIVABILITY, MINE DETECTION, OPERATIONAL EFFECTIVENESS, COMMAND AND CONTROL SYSTEMS, MOUNTS

Identifiers:

(U) IVMMD-ST5(INTERIM VEHICLE MOUNTED MINE DETECTOR STANDARD TELEOPERATION SYSTEM)

**System Description:**

The IVMMD system consists of a tractor-type lead mine detection vehicle (MDV) called the Meerkat; a second larger mine detection tractor-type vehicle called the Husky which tows three weighted trailers designed to explode pressure-fused mines; and spare part replacement modules and components to repair the system after a mine explosion. The MDV sweeps ahead of the other modules of the system with a pulse-induction metal detection sensor array mounted underneath the chassis between the two axles, at about the centerpoint of the vehicle. The vehicle is lightweight, making it overpass-capable for pressure fused mines, since it must drive over a mine in order to detect it. When the Meerkat detects a metallic object suspected to be a landmine, it alerts the operator with audible and visual signal cues. Once the location of the suspected mine is pinpointed, the system operator marks the spot with a brightly colored dye using either the left or right sprayer located between the IVMMD's detection panels. The system is designed to withstand the effects of a mine blast with minimal damage so that it can be quickly and easily repaired to continue the mission. The front and rear wheel assemblies are installed with special bolts that are designed to shear during a mine explosion so that the wheel assemblies can be easily replaced. The only IVMMD component used during testing of the STS kit was the Meerkat lead MDV, since this is the only component that will be teleoperated.

STS Kit. The STS kit consists of an OCD, a mobile base control unit (MBCD), base radio unit (BRD)/base antenna array (BANT), mobile radio unit (MRD), two video cameras, video transmission unit (VTD), video multiplexor unit (VMU), high-integration actuator (RIA) set, system input/output (SIO) unit, manual/automatic switch, power system unit (PSD), antennas, and an independent emergency stop. The OCD is contained in a hard-sided suitcase. It has a steering wheel for remote control operation of the vehicle, as well as other various controls to replicate the driving and mine detection controls and functions found inside the MDV cab. Feedback from the MDV is provided visually to the operator via a liquid crystal display (LCD) which digitally displays the MDV gauge data for speed, engine and transmission pressure, and operating temperature characteristics. Two cameras are mounted on the MDV, front and rear. Either view can be displayed on the OCD screen by the flip of a switch. The system operator switches between the two camera views as necessary when driving the vehicle in the forward or reverse direction. The MBCD is mounted on the MDV and operates off its power supply. The MBCD communicates with the OCD through radio transmissions, receiving control input signals from the OCD and sending system status feedback signals to the OCD. The MBCD translates the control input signals received into the appropriate instructions required to manipulate the system actuators to control steering, braking, gear shifting, mine detection functions, etc., of the MDV. The MBCD also sends the video camera feed and telemetry data back to the OCD. The STS provides an emergency stop function through an independent link that uses a portable transmitter to stop vehicle operation. The system includes a built-in safety feature designed to stop the vehicle if communications or power is lost. A panic stop function was provided to stop the vehicle from the control unit should an emergency arise.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- IVMMD-STS Meerkat

**Reference** (Winslow et al., 2001):

Winslow, G., Addison, C., Faker, D., Swiger, A., Landy, K., Allen, W., & Mallamo, J. (2001). System Assessment (SA) for the Interim Vehicle-Mounted Mine Detector Standard Teleoperation System (IVMMD-STS): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. AEC, APG, MD. DTIC ADB265308.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:  
150606 - Land Mine Warfare  
Descriptors:

(U) \*MILITARY VEHICLES, \*MINE DETECTORS, SURVIVABILITY, MINE DETECTION, OPERATIONAL EFFECTIVENESS, COMMAND AND CONTROL SYSTEMS, MOUNTS

Identifiers:

(U) IVMMD-STS(INTERIM VEHICLE MOUNTED MINE DETECTOR STANDARD TELEOPERATION SYSTEM)

**System Description:**

**IVMMD.** The IVMMD system consists of a tractor-type lead mine detection vehicle (MDV) called the **Meerkat** a second larger mine detection tractor-type vehicle called the Husky which tows three weighted trailers designed to explode pressure-fused mines; and spare part replacement modules and components to repair the system after a mine explosion. The MDV sweeps ahead of the other modules of the system with a pulse-induction metal detection sensor array mounted underneath the chassis between the two axles, at about the centerpoint of the vehicle. The vehicle is lightweight, making it overpass-capable for pressure fused mines, since it must drive over a mine in order to detect it. When the Meerkat detects a metallic object suspected to be a landmine, it alerts the operator with audible and visual signal cues. Once the location of the suspected mine is pinpointed, the system operator marks the spot with a brightly colored dye using either the left or right sprayer located between the IVMMD's detection panels. The system is designed to withstand the effects of a mine blast with minimal damage so that it can be quickly and easily repaired to continue the mission. The front and rear wheel assemblies are installed with special bolts that are designed to shear during a mine explosion so that the wheel assemblies can be easily replaced. The only IVMMD component used during testing of the STS kit was the Meerkat lead MDV, since this is the only component that will be teleoperated.

**STS Kit.** The STS kit (consists of an OCD, a mobile base control unit (MBCD), base radio unit (BRD)/base antenna array (BANT), mobile radio unit (MRD), two video cameras, video transmission unit (VTD), video multiplexor unit (VMU), high-integration actuator (RIA) set, system input/output (SIO) unit, manual/automatic switch, power system unit (PSD), antennas, and an independent emergency stop. The OCD is contained in a hard-sided suitcase. It has a steering wheel for remote control operation of the vehicle, as well as other various controls to replicate the driving and mine detection controls and functions found inside the MDV cab. Feedback from the MDV is provided visually to the operator via a liquid crystal display (LCD) which digitally displays the MDV gauge data for speed, engine and transmission pressure, and operating temperature characteristics. Two cameras are mounted on the MDV, front and rear. Either view can be displayed on the OCD screen by the flip of a switch. The system operator switches between the two camera views as necessary when driving the vehicle in the forward or reverse direction. The MBCD is mounted on the MDV and operates off its power supply. The MBCD communicates with the OCD through radio transmissions, receiving control input signals from the OCD and sending system status feedback signals to the OCD. The MBCD translates the control input signals received into the appropriate instructions required to manipulate the system actuators to control steering, braking, gear shifting, mine detection functions, etc., of the MDV. The MBCD also sends the video camera feed and telemetry data back to the OCD. The STS provides an emergency stop function through an independent link that uses a portable transmitter to stop vehicle operation. The system includes a built-in safety feature designed to stop the vehicle if communications or power is lost. A panic stop function was provided to stop the vehicle from the control unit should an emergency arise.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- JBSDS

**Reference** (Kuria et al., 2003):

Kuria, I., Brown, T., Tackett, S., Finanger, K., & Fuller, J. (2003). System Evaluation Report (SER) for the Joint Biological Standoff Detection System (JBSDS) Block I: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 31208813. DTIC ADB288842.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

170800 - Miscellaneous Detection and Detectors

Descriptors:

(U) \*BIOLOGICAL DETECTION, TEST AND EVALUATION, REQUIREMENTS, DETECTORS,  
STANDOFF, SURVIVABILITY, OPERATIONAL READINESS, DOCUMENTS, SYSTEMS ANALYSIS

Identifiers:

(U) JBSDS(JOINT BIOLOGICAL STANDOFF DETECTION SYSTEM)

**System Description:**

The JBSDS will provide standoff detection, ranging, tracking, generic aerosol detection and discrimination (bio vs. non-bio) of Biological Warfare (BW) aerosol clouds for advanced warning, reporting, and protection. In support of the time-phased requirements specified in the JBSDS JORD, the Joint Program Office for Biological Defense (JPO-BD) has developed a block development acquisition strategy. JBSDS Block I will provide an initial operationally useful and supportable capability in as short a time as possible. The JBSDS Block I program has an Acquisition Objective (AO) of 25 systems. The Block I production effort will provide for First Unit Equipped (FUE) in 4QFY05. The JBSDS Block II will emphasize increasing sensitivity, range and reliability, while reducing life-cycle costs, weight, power requirements, and size as compared to JBSDS Block I. The JBSDS Block I will be employed at fixed sites or in a stationary mode from mobile platforms such as the High Mobility Multipurpose Wheeled Vehicle (HMMWV). JBSDS Block I operators will relay alert information via radio or land line to existing command and control units. The JBSDS Block II will be employed to provide mobile (on-the-move) detection of biological hazards and will provide early warning via the Joint Warning and Reporting Network (JWARN). The JBSDS Block I consists of four major subcomponents: An Infrared (IR)/Ultraviolet (UV) laser transmitter; a receiving telescope/detector; an information processor and system control module; and a gimbal stabilized platform. The IR/UV laser system will be operationally eye-safe. The system will be a common standoff module that will be mounted at fixed sites or on a High Mobility Multipurpose Wheeled Vehicle (HMMWV).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- JLCCTC

**Reference** (Buck et al., 2006):

Buck, S., Chui, H., Hall, L., Lema, A., & Conklin, J. (2006). System Evaluation Report (SER) for the Joint Land Component Constructive Training Capability (JLCCTC) Version 3.0: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 63199202. DTIC ADB322420.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

050900 - Personnel Management and Labor Relations

150607 - Unconventional Warfare

Descriptors:

(U) \*ARMY TRAINING, \*MILITARY EXERCISES, TEST AND EVALUATION, COMBAT SIMULATION,  
COMMAND AND CONTROL SYSTEMS

**System Description:**

The JLCCTC is a command post exercise driver designed to train Army commanders and their battle staffs. This multi-resolution federation (MR-F) of simulations enables training at the Brigade Combat

Team (BCT), Division/Corps or Joint level. The JLCCTC provides a simulated operational environment in which computer-generated forces (CGF) stimulate and respond to the command and control processes of the commanders and staffs.

These commanders and staffs are known as the training audience (TA). They interface with the simulation via command, control, communication, computers, and intelligence (C4I) devices or via role players. Role players typically represent (play the role of) the military superiors or subordinates of the TA. They convert direction into simulation input via the JLCCTC's Army user interfaces. Role players also interpret simulation output and relay that information to the TA. The role player-TA communication channels include voice, e-mail, chat, or formatted messages sent to the TA's C4I devices. A third team of human operators, referred to as technical controllers, start and stop the system and control run-time parameters such as game speed. The interfaces between the simulations and the TA are designed to make the JLCCTC totally transparent to the trainees.

**Opposing Forces (OPFOR) presence is essential for realistic training.** They are portrayed by operators working in a cell dedicated to providing an exercise with OPFOR stimulation. The JLCCTC must accurately portray enemy movements, formations, weapon systems (including unconventional systems such as improvised explosive devices (IEDs) with conventional or nuclear, biological and chemical payloads), logistics, lines-of-communication, haul capabilities, electromagnetic emission characteristics, and command and control systems. The command and control systems consist of the current doctrine, tactics, techniques, and procedures as experienced within the contemporary operational environment (COE). OPFOR must have uniquely identifiable variations in organizations, equipment, tactics, techniques, and procedures sufficient to enable the TA to differentiate forces when multiple opponents are operating against them.

Technical Context.

**a. From a technical perspective, the JLCCTC is an interconnected set of constructive simulation software,** supporting software, and commercial-off-the-shelf (COTS) hardware. The federates are connected by a combination of the standard high level architecture (HLA), run time infrastructure (RTI), distributed interactive simulation (DIS), and custom interfaces. The Federation encompasses both an entity and an aggregate level simulation, a logistics simulation, a simulation that provides non-kinetic effects, and both lower and upper enclave intelligence simulations.

**b. The following is the list of federates that make up version 3.0 of the JLCCTC:**

**(1) Corps Battle Simulation (CBS).** CBS acts as the aggregate level exercise driver for the Federation. It simulates most aspects of combat, combat support, and combat service support military operations.

**(2) Joint Non-Kinetic Effects Model (JNEM).** JNEM provides significant asymmetric activity stimulation to CBS. JNEM determines realistic effects of economic, political, religious, and social concerns of the local population on military actions. Good military decisions lead to good results in the combat simulation and bad decisions, which may include failure to act, lead to bad results.

**(3) Logistics Federate (LOGFED).** LOGFED integrates the best pieces from the Joint Deployment and Logistics Model (JDLM) and the Combat Service Support Training Simulation System (CSSTSS) to provide commanders and their staffs with high fidelity combat service support information in a cost-effective environment to gain and maintain proficiency in deployment, planning, and rehearsal. The Logistics Interface Device (LID) is a software application that allows simulation data generated by the JDLM to be transferred and received by the Battle Command and Sustainment Support System (BCS3) real-world C4I device in a manner that BCS3 understands.

**(4) Joint Conflict and Tactical Simulation (JCATS).** JCATS acts as the entity-level exercise driver of combat and non-combat operations for the Federation. It models most aspects of small unit operations, fixed and rotary wing aviation, as well as peacekeeping, counterterrorism, and crowd control. JCATS models natural and cultural features in detail.

**(5) Run Time Manager (RTM).** RTM provides interface services that permit JLCCTC users, the TA, to interact with the simulation using their organic C4I equipment. The RTM federate has three essential functions:

\* Receiving and accumulating information from the models.

\* Compiling the data for use by C4I devices.

\* Sending information to specific C4I workstations on a real-time or scheduled timetable.

**(6) Independent Simulation Module (ISM).** ISM is a master scenario event list (MSEL) injection tool that allows operators to insert selected events directly into CBS or the Global Command and Control System-Army (GCCS-A) and the Maneuver Control System (MCS).

**(7) Warfighters' Simulation (WARSIM).** WARSIM Intel model provides the simulation of the military intelligence unit personnel and equipment with their associated maneuver behaviors and is responsible

for the simulation of the lower enclave intelligence sensors and the behaviors associated with the intelligence cycle.

**(8) Tactical Simulation (TACSIM).** TACSWI provides simulated upper enclave intelligence collection and reporting to support training of intelligence analysts, operators, and collection managers. It also provides training for commanders and staffs through aggregated products that do not require further intelligence analysis. TACSIM is a family of simulation processes and processors that simulate/stimulate the U.S. intelligence system, from tactical to national levels. The National Wargaming System (NWARS) is an interactive intelligence asset simulator that supports training by modeling tasking, collection, and reporting of national systems. It interfaces with the Federation through TACSIM.

**(9) Multiple Unified Simulation Environment (MUSE).** MUSE simulates unmanned aerial vehicles. In the JLCCTC, it is driven by a feed from TACSIM.

(10) Vision XXI. Vision XXI is an after-action-review (AAR) and exercise control system, providing an integrated view and analysis of the JLCCTC training environment. The system provides analysts with an extensive set of visualization, reporting, and analytical tools.

**(11) Joint Infrastructure Software (JIS).** JIS has major components that include the RTI, federation management tool (FMT), and the aggregate level simulation protocol (ALSP) Data and Protocol Transfer over the RTI (ADAPTOR). Together, these systems allow interaction among federates. The RTI handles executive functions essential for operation of all JIS components. The FMT provides visual displays and control functions. The ADAPTOR allows some federates such as CBS and LOGFED to participate in the Federation.

**(12) After Action Review System (AARS).** AARS provides the Federation with the capability to look back on an exercise to see what happened, when it happened, why it happened, and how to sustain strengths and improve on weaknesses. It includes data collection, archiving, analysis, distribution, and the creation and presentation of reports tailored to the needs of the TA.

The JLCCTC is used for institutional training (U.S. Army Training and Doctrine Command schools), unit sponsored training, Battle Command Training Program (BCTP) Warfighter training, and Joint training exercises. All BCTP training is managed from the Regional Training Center (RTC) with a "forward interface" link to the unit training site. All U.S. Army Forces Command (FORSCOM) sponsored training is managed through the Battle Simulation Centers (BSCs) located with forward interfaces to the unit training site. Command and General Staff College training is managed at the RTC in Fort Leavenworth, KS.

#### **Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- JNMS

#### **Reference** (Kirk et al., 2004):

Kirk, E. D., Wong, N., Powell, M., Markham, W., Welsh, M., & Pillow, C. (2004). System Evaluation Report (SER) for the Joint Network Management System (JNMS): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 41918967.

#### **Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

#### **System Description:**

The JNMS is a Combatant Commander, Joint Forces (CIF), joint communications planning and management system. The benefits that the JNMS is designed to provide include: enhanced force-level situational awareness (shared view of the network); enhanced flexibility to support the commander's intent; better use of scarce spectrum resources; and increased security of critical systems and networks. As an enabler for information superiority as well as command and control (C2), the JNMS serves as the planners' "brain center" for the systems and networks supporting the forces. It ensures Command,

Control, Communications, Computers, and Intelligence (C4I) unity of effort, exploitation of Total Force capabilities, proper positioning of critical information, and allows for its fusion. Key Features include:

- High-level Planning.
- Detailed Planning and Engineering.
- Monitoring.
- Control and Reconfiguration.
- Security.
- Spectrum Planning and Management.
- Information Assurance (IA).
- Reporting (Annex K signal annex of an OPORD, Satellite Access Request (SAR) and Gateway Access Request (GAR).
- Interoperability.

The JNMS is primarily a software system. The implementation of the JNMS will be dependent upon the software architecture delivered by the contractor and the hardware configuration driven by that architecture (Reference: JNMS Doctrinal Organizational Test Support Package (DOTSP), dated 7 April 2003). The contractor will provide the basic characteristics of the platforms that are required to host the JNMS software. The Services' implementation will be based on their selection of hardware that meets those requirements. The required technical parameters for the hardware have been identified in the JNMS performance specifications.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- JTIDS

**Reference (OPTEC, 1997):**

OPTEC. (1997). System Evaluation Report (SER) for the Joint Tactical Information Distribution System (JTIDS): U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 81149034 / TDR-OTE-11-0197.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

**System Description:**

The Joint Tactical Information Display System (JTIDS) is a multiservice acquisition program being led by the US Air Force. JTIDS is designed to provide secure transmission of position, target track, and voice data between host terminals in a manner that is transparent to the user. The user or host terminal is any system which originates or receives digitized tactical information transmitted over the JTIDS secure radio links. The system was originally designed to provide communication between F-15 and Advance Warning and Control System (AWACS) aircraft and Combat Reporting Centers (CRC). The US Army recognized the potential for improved communication between Air Force and Army Air Defense Artillery (ADA) units, and within ADA units, and became part of the program well into the development process. The Army host terminals were to be TSQ-73s at the brigade and battalion levels for the HAWK fire units, the Platoon Command P9st (PCP) at the batteries, and the PATRIOT missile system.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Laser- LLDR

**Reference** (Jones et al., 2001):

Jones, W., Brink, R., Kucinski, G., Rambo, P., Zwicke, R., Pilcher, J., Daughtry, C., Riggs, C., Goos, W., Etheridge, D., & Erdmann, P. (2001). System Evaluation Report (SER) for the Lightweight Laser Designator Rangefinder (LLDR): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB272779.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

170500 - Optical Detection and Detectors

171100 - Target Direction, Range and Position Finding

Descriptors:

(U) \*LASER TARGET DESIGNATORS, \*RANGE FINDING, TEST AND EVALUATION, INTEGRATED SYSTEMS, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, LIGHTWEIGHT, LETHALITY, SYSTEMS ANALYSIS

**System Description:**

The LLDR is a man-portable target acquisition device, which is the company and battalion commander's dedicated long-range fire support targeting sensor. Its modular, lightweight design gives the commander flexibility for deployment, and enhances the survivability of fire support personnel. It enables the commander to attack targets at extended ranges with increased accuracy in both day and night operations. The system improves the commander's ability to shape the battlefield through the judicious use of indirect and precision fires. The LLDR replaces the Ground/Vehicular Laser Locator Designator (G/VLLD) with a state-of-the-art, lightweight targeting system capable of operating within the Advanced Field Artillery Tactical Data System (AFATDS) and Future Battle Command (FBC) framework. The three primary components of the system are the Target Location Module (TLM) and Laser Designator Module (LDM), with an internal Global Positioning System (GPS). The lightweight laser designator and rangefinder can also be used for laser-guided weapons delivery. The LLDR will determine range, azimuth, vertical angle to a target, and integrate self-location GPS data, to send a complete Call-for-Fire (CFF) command through an automated digital process to a fire direction agency. The system also presents data to the operator through the optical sight. In addition, LLDR includes a lightweight tripod, thermal night sight, battery, and connections for accessing external power.

Total system weight, including all ancillary equipment, (batteries, carrying case, night sight, tripod, operators manual, and cleaning kit) was not to exceed a total system weight of 30 pounds, packaged in two 15-pound loads. The Position Location GPS Receiver (PLGR) and digital interface are not included in the 3D-pound limit. (ORD reference 4.a. (1)) A single soldier can operate a dismounted LLDR. The LLDR combines technical advances in position location, optics, thermal night sights, and laser designation.

Critical System Characteristics.

- a. The LLDR must present data visually as well as digitally to allow an operator with a radio to request effective fires by voice.
- b. The LLDR must be hardened against Electro optical (laser), Electro-optic countermeasures (EOCM), and micro directed energy weapons and devices.
- c. The system must operate under conditions that include obscurants, rain, fog, sleet, snow, haze, and dust, within the limits of thermal imaging and lasers.
- d. The system must survive the effects of Electromagnetic Pulse (EMP). Nuclear hardening against blast, thermal, and radiation is not required.
- e. The LLDR system signatures should be minimized.
- f. NBC contamination survivability is required. The LLDR must be hardened against the effects of NBC contaminants and decontamination agents. The system design must prevent accumulation or penetration of NBC contaminants. The device must be operated, maintained, and resupplied by soldiers in Mission-Oriented Protective Posture (MOPP) IV.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to

Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458:

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**System Short Name:** SER- Laser- MILES 2000

**Reference** (Meirose and Matthews, 2002):

Meirose, J. A., & Matthews, S. (2002). System Assessment (SA) for the Multiple Laser Engagement System (MILES) 2000: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB276195.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

090300 - Lasers and Masers

150600 - Military Operations, Strategy and Tactics

Descriptors:

(U) \*TRAINING DEVICES, \*LASER APPLICATIONS, \*MILITARY TRAINING, \*LASER COMMUNICATIONS, TEST AND EVALUATION, LOW POWER, MILITARY OPERATIONS, WEAPON SYSTEMS, TARGET ACQUISITION, OPERATIONAL EFFECTIVENESS, RECEIVERS, EYE SAFETY, TRANSMITTERS, TARGET DETECTION, TACTICAL WEAPONS

Identifiers:

(U) \*MILES(MULTIPLE LASER ENGAGEMENT SYSTEM), TESS(TARGET ENGAGEMENT SIMULATION SYSTEM)

**System Description:**

The MILES 2000 system (like its predecessor Basic MILES) is a family of low-power, eye-safe laser transmitters and receivers designed to simulate the operational characteristics of various weapons. This system allows units to conduct realistic force-on-force tactical training exercises. A MILES-equipped weapon engages a target through the use of an encoded laser communication channel with the transmitter boresighted with the weapon's target acquisition sighting system. The receipt of the laser message by detectors mounted on the intended target causes the MILES internal control system to signal near miss, hit, or kill information to personnel by audio and/or visual signals. The Basic MILES was developed in response to the Army's need for realistic combined arms tactical training. The MILES devices are not intended for gunnery trainers, but rather for collective training of soldiers in two-sided and free play tactical training exercises. Presently MILES has been fielded to divisional units in the continental United States (CONUS), U.S. Army, Europe (USAREUR), and Korea, as well as to the Reserves and National Guard. The expansion of MILES to accommodate additional weapon systems is continuing as requirements are identified. MILES 2000 is a program to replace Basic MILES devices, which are nearing the end of their economic life.

This SA is limited to the Individual Weapon System (IWS) and the Surrogate Weapon System (SWS) AT-4. The IWS is composed of a man-worn laser detector and a system-specific Small Arms Transmitter (SAT). The SWS is a training surrogate for the AT-4 anti-air missile.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Laundry- CBL

**Reference** (Byanski, 2004):

Byanski, L. (2004). System Evaluation Report (SER) for the Full-Rate Production (FRP) Decision for the Containerized Batch Laundry (CBL) / Abbreviated (ASER): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB295923.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

130900 - Machinery and Tools

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*LAUNDRY OPERATIONS, \*WASHERS(CLEANERS), \*CONTAINERIZING, PORTABLE EQUIPMENT, LOGISTICS SUPPORT, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, GOVERNMENT FURNISHED EQUIPMENT

Identifiers:

(U) CBL(CONTAINERIZED BATCH LAUNDRY), FRP(FULL-RATE PRODUCTION)

**System Description:**

Containerized Batch Laundry (CBL).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Laundry- CSSL

**Reference** (Walker and Finkel, 2000):

Walker, J., & Finkel, M. (2000). System Evaluation Report (SER) for the Containerized Self-Service Laundry (CSSL): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Ft. Hood, TX. Report #: 03088322. DTIC ADB257197.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*LAUNDRY OPERATIONS, TEST AND EVALUATION, CENTER OF GRAVITY, SAFETY, CLASSIFICATION, SELF OPERATION, SYSTEMS ANALYSIS, CLEANING, CONTAINERIZING

Identifiers:

(U) SER(SYSTEM EVALUATION REPORT), CSSL(CONTAINERIZED SELF SERVICE LAUNDRY), PVT(PRODUCTION VERIFICATION TEST)

**System Description:**

The CSSL is composed of commercial laundry equipment (six washers and six dryers) mounted in an 8- by 8- by 20 foot International Standards Organization (ISO) container. The container is equipped with interior lighting, a small heater to keep water from freezing in the washers when not in use, and a ventilation fan. All ancillary equipment, including pumps, hoses, a softwall shelter (to house a sorting and folding area), tables, laundry carts, and a flexible water tank are stored in the container. The CSSL requires commercial power or the Army's 30 kW generator (not a component of the CSSL). The CSSL will not launder Common Table of Allowances (CTA) 50-900 clothing nor is it intended to replace or augment the current laundry mission of the M-85 laundry.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

**System Short Name:** SER- Laundry- LADS

**Reference** (Prather et al., 1999):

Prather, M. P., Finkel, M., Fujiwara, M., & Hannah, T. (1999). System Evaluation Report (SER) for the Laundry Advanced System (LADS): U.S. Army Operational Test and Evaluation Comd., ATTN: CSTE-XXX-XXX, Part Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. USAEAC, APG, MD. Report #: 90367062 / SER 01-99. DTIC ADB241473.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*LAUNDRY OPERATIONS, TEST AND EVALUATION, MATERIEL, INTEGRATED SYSTEMS, MILITARY EQUIPMENT, CLASSIFICATION, RELEASE, SYSTEMS ANALYSIS

Identifiers:

(U) LADS(LAUNDRY ADVANCED SYSTEM), SER(SYSTEM EVALUATION REPORT)

**System Description:**

The LADS consists of two laundry drums, one distillation based water recycling system, one International Organization for Standardization (ISO) flatrack (measuring 8 feet by 8 feet by 20 feet), and a Government-furnished equipment (GFE) 30-kW diesel-engine-driven tactical quiet generator (TQG), all mounted on a GFE 2 1/2 ton M871 semitrailer (National Stock Number (NSN) 2330-00-122-6779) measuring 30 feet long by 8 feet wide. The LADS attaches to the trailer via ISO locks. The LADS is towed by a 5-ton tractor in the field. An electric water pump (GFE) supplies water from a field water storage tank. The system requires some items of associated equipment to perform its mission. These include a water storage tank, a fuel storage tank, and a shelter to house the system during operations below 33 degrees F.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- LESD

**Reference** (Neal, 2008):

Neal, S. Y. (2008). Operational Test Agency Evaluation Report (OER) for the Launched Electrode Stun Device (Lesd) / Abbreviated (OER-a): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. ARMY EVALUATION CENTER ALEXANDRIA VA. DTIC ADB342754.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA), OTA Assessment Report (OAR), OTA Milestone "x" Assessment Report (OMAR), OTA Evaluation Report (OER), OTA Follow-on Evaluation Report (OFER), Operational Test Report (OTR), Abbreviated Operational Test Report (AOTR), Army Input to the OTA Report (AIOR)

\*nonlethal weapons, \*test and evaluation, reliability, protection, environmental tests, incapacitation, riot control, operational effectiveness, survivability, electrodes

\*lesd(launched electrode stun device), suitability, tasers, crowd control, stun guns

Fields and Groups:

150300 - Defense Systems

Descriptors:

(U) \*NONLETHAL WEAPONS, \*TEST AND EVALUATION, RELIABILITY, PROTECTION, ENVIRONMENTAL TESTS, INCAPACITATION, RIOT CONTROL, OPERATIONAL EFFECTIVENESS, SURVIVABILITY, ELECTRODES

Identifiers:

(U) \*LESD(LAUNCHED ELECTRODE STUN DEVICE), SUITABILITY, TASERS, CROWD CONTROL, STUN GUNS

**System Description:**

- (1) The commercial-off-the-shelf X-26 TASER manufactured by TASER International in Scottsdale, AZ, was selected as a materiel solution for the LESD requirement.
- (2) The LESD is a conducted energy device that utilizes compressed nitrogen to launch two small probes 21, 25, or 35 feet depending on the cartridge loaded. These probes are connected to the LESD device by insulated wire. The probes output is a high voltage (50Kv), low-amperage (2.1 mA) signal with a pulse rate of 19 pulses per second. The electrical output causes involuntary muscle contraction (tetany), and loss of motor control. When the trigger is pulled, the LESD emits a waveform for 5 seconds or until the safety lever is engaged. The signal can be re-applied by pressing the trigger again or by continuously depressing it. Continuous depression provides continuous application.
- (3) The LESD has an internal memory that stores the operating software and a record of every deployment to include time, date, duration of each discharge, the system internal temperature, dates of recorded data, and the serial number and current software version.
- (4) The LESD is powered by an Extended Digital Power Magazine (XDPM), which is a custom rechargeable lithium energy cell power supply system.
- (5) The LESD comes standard with an integrated laser sight, illumination selector, and low intensity illuminators (LIL). The laser and LIL will activate automatically when the safety switch is armed unless otherwise programmed using the illumination selector.
- (6) A Central Information Display (CID) located on the back of the LESD displays the XDPM power level, burst time countdown, warranty/general system status.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- LOCB

**Reference** (Bittner et al., 2009):

Bittner, K., Nicholson, N., Fujiwara, M., Merchant, D., Dryden, L., Zebron, D., McKeever, J., & Jackson, G. (2009). OTA Milestone Assessment Report (OMAR) for the Line of Communications Bridge (LOCB) Milestone C Low Rate Initial Production Decision: U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 9177100144.

**Key Words:**

OMAR  
Milestone C  
Low Rate Initial Production Decision  
LOCB  
Line of Communication Bridge

**System Description:**

The proposed LOCB will provide the Army with the capability to cross gaps of 50 meters with a single span bridge with a Military Load Classification (MLC) 85 Tracked/100 Wheeled (T), 100 Tracked/120 Wheeled (O). The proposed LOCB will span both wet and dry gaps up to 50 meters single span capable of constructing multiple-span bridges for gaps beyond 50 meters. Also, the LOCB will be capable of over-

bridging existing bridge structures providing an MLC, which supports all military and civilian traffic within the theater of operation without any degradation to the existing structure.

The LOCB will:

- Replace the World War II M2 Bailey Bridge.
- Have the following military-unique requirements: Military lifting and tie down provisions (Military Standard-209), and Chemical Agent Resistive Coating.
- Be transportable worldwide with no route restrictions by rail, marine, highway, and air modes (C-130, C-5, and C-17). International Organization for Standardization containerized LOCB shipping configurations shall be capable of air transport within a C5 aircraft. Tie-downs are required to prevent shifting or movement during transport.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- LRAS3

**Reference** (McGuire and Schmidt, 1999):

McGuire, G., & Schmidt, R. C. (1999). System Evaluation Report (SER) for the Long Range Advanced Scout Surveillance System (LRAS3): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA DTIC ADB249318.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

170501 - Infrared Detection and Detectors

171100 - Target Direction, Range and Position Finding

Descriptors:

(U) \*FORWARD LOOKING INFRARED SYSTEMS, \*TARGET DETECTION, \*INFRARED SURVEILLANCE, TEST AND EVALUATION, COMBAT SURVEILLANCE, TARGET ACQUISITION, LONG RANGE(DISTANCE), GLOBAL POSITIONING SYSTEM, RUGGEDIZED EQUIPMENT

Identifiers:

(U) LRAS3(LONG RANGE ADVANCED SCOUT SURVEILLANCE SYSTEM)

**System Description:**

The LRAS3 integrates a second generation forward looking infrared (FLIR) sensor, a day video camera (DVC), a laser range finder, and the Global Positioning System - Interferometer System (GPSIS). The GPSIS includes digital compass, global positioning system, and vertical angle measurement subsystems. The LRAS3 is designed to enhance current scout capabilities by extending target detection, acquisition, recognition, and identification range, and providing target position. It can be used either mounted on a heavy HMMWV, or dismounted on a tripod.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- LRAS3

**Reference** (Byrne and Schmidt, 2000):

Byrne, J. P., & Schmidt, R. C. (2000). System Evaluation Report (SER) for the Configuration of Corrective Actions to the Far Target Location Function of the Long Range Advanced Scout Surveillance System (LRAS3): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 10228368 / 2000-LU-CMBT-1873A-1. DTIC ADB261536.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

170501 - Infrared Detection and Detectors

Descriptors:

(U) \*FORWARD LOOKING INFRARED SYSTEMS, \*INFRARED SURVEILLANCE, TEST AND EVALUATION, FUNCTIONS, POSITION(LOCATION), TARGETS, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, LASER APPLICATIONS, PLATFORMS, GLOBAL POSITIONING SYSTEM, EYE SAFETY, CAMERAS, SYSTEMS ANALYSIS, VEHICLES, LASER SAFETY, TARGET DETECTION, ELEVATION, RANGE FINDING, VIDEO SIGNALS, AZIMUTH, TRIPODS

**System Description:**

**Capabilities.** The LRAS3 is a device that integrates the capabilities of the second generation Forward Looking Infrared (FLIR) sensor, a Day Video Camera (DVC), an Eyesafe Laser Range Finder (ELRF), and the Global Positioning System Interferometer System (GPSIS). The GPSIS includes digital compass, global positioning system, and vertical angle measurement subsystems. The purpose is to improve the existing soldier capabilities to perform the scout mission by extending target detection, acquisition, recognition, and identification range beyond the direct-fire range of targeted vehicles.

**Existing System.** The LRAS3 responds to shortcomings of the Night Observation Device, Long Range (NODLR). The NODLR is the current system employed by ground scouts to gather intelligence information on enemy deployment at the leading edge of the battlefield. The expected LRAS3 detection range is over three times that of the NODLR. This will place the scout unit out of range of the enemy capability to detect and fire on the unit. LRAS3 is required to locate the target with sufficient accuracy that higher unit battle planning and survivability are greatly enhanced. The capabilities of this device make it essentially a new materiel item rather than simply a replacement for an existing system.

**Requirement.** The Operational Requirements Document (ORD) requires that a three-man scout team operate the LRAS3 in mounted and dismounted modes. In the mounted mode, it operates on the host vehicle platform using the vehicle power. In the dismounted mode, LRAS3 operates on a tripod using its own battery power. In the future, the mounted LRAS3 must interface with the digital systems on the host vehicle to provide transmission of the collected data through the Force XXI Battle Command Brigade and Below (FBCB2) environment. Transition to and from the dismounted mode must be rapidly accomplished to ensure the fluid movement of the scout unit on the battlefield. Up to 6 hours dismounted operation is required using battery power (2 hours per battery pack) to support a typical scout mission. Battery change must be easily accomplished in order to provide continuity of operations.

**Target Display.** Basic target acquisition is provided by a second generation FLIR and DVC augmented with laser range finder and GPSIS. The sensor-processing unit integrates these elements, performs target location and range functions and passes target data to the display. A digital output port is planned to provide an interface to FBCB2.

**Integrated Logistic Support.** LRAS3 must be supported within the current standard maintenance and Integrated Logistics Support (ILS) structure and concepts, with repair of failed units to be accomplished by contractor support. A system Built-In Test (BIT) capability is designed to improve LRAS3 supportability functions.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- LRAS3 WM

**Reference** (Byrne and Flood, 2001):

Byrne, J. P., & Flood, S. (2001). System Assessment (SA) for the Continuous Evaluation of the Long Range Advanced Scout Surveillance System (LRAS3) for Confirmation of Corrective Actions to the Weapons Mounting (WM): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. AEC, APG, MD. DTIC ADB266208.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

170501 - Infrared Detection and Detectors

170700 - Navigation and Guidance

171100 - Target Direction, Range and Position Finding

Descriptors:

(U) \*FORWARD LOOKING INFRARED SYSTEMS, \*GLOBAL POSITIONING SYSTEM, \*TARGET DETECTION, \*SURVEILLANCE, TEST AND EVALUATION, WEAPONS, TARGETS, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, LASER APPLICATIONS, ENGINEERING, MOUNTS, SYSTEMS ANALYSIS, VEHICLES, LASER SAFETY, RANGE FINDING, TRIPODS

Identifiers:

(U) LRAS3(LONG RANGE ADVANCED SCOUT SURVEILLANCE SYSTEM), FLIR(FORWARD LOOKING INFRARED), DVC(DAY VIDEO CAMERA), GPSIS(GLOBAL POSITIONING SYSTEM INTERFEROMETER SUBSYSTEM), ELRF(EYESAFE LASER RANGE FINDER)

**System Description:**

The LRAS3 is designed to provide necessary improvements in optics, Laser Range Finder (LRF), and Forward-Looking Infrared (FLIR) technology to detect and identify the projected threat of the 21st century at operationally required ranges. The LRAS3 is to be a mounted, man-portable (two-man lift), long-range reconnaissance and surveillance device. It is designed to provide reconnaissance and surveillance units with near all weather reconnaissance, surveillance, and target acquisition. Its line-of-sight sensor system is to provide real-time acquisition and target detection, recognition, identification, and location information to the Scout. It will be employed in the ground-mounted configuration or mounted on reconnaissance vehicles. It has a built-in LRF and laser target designator. It is expected to accurately determine far target location and range and present the target information in the system display or to a digital port. Its sighting capabilities will be based upon the second generation FLIR (2d GEN FLIR) and low-light-level television (TV). The LRAS3 is to be capable of remaining in the mounted ready-to-operate position on all host vehicles during crosscountry movement.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- LVOSS

**Reference** (Valentine et al., 2000):

Valentine, J. L., Simmons, D., Knuckles, S., Fujiwara, M., & Yowell, R. (2000). System Assessment (SA) for the Light Vehicle Obscuration Smoke System (LVOSS): U.S. Army Test and Evaluation Command, Part Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB252894.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

190101 - Pyrotechnics

190300 - Combat Vehicles

Descriptors:

(U) \*SMOKE MUNITIONS, \*MILITARY VEHICLES, TEST AND EVALUATION, PRODUCTION, SYSTEMS ANALYSIS, QUALITY ASSURANCE, OBSCURATION

Identifiers:

(U) EXPORT CONTROL, LVOSS(LIGHT VEHICLE OBSCURATION SMOKE SYSTEM)

**System Description:**

The LVOSS is a self-defense smoke obscurant system externally mounted on light vehicles, primarily the high-mobility multipurpose wheeled vehicle (HMMWV), in units whose mission places them at greater risk of engagement from enemy direct and indirect fire weapons and weapon systems.

a. The LVOSS consists of one arming/firing unit (A/FU), a wiring harness, mounting brackets and hardware, and one to four M7 dischargers with elevation brackets. The LVOSS components are integrated as a complete system that is operated from within the vehicle via the A/FU.

b. The plastic M7 discharger, based on the design of the fielded M257 discharger, has four 66mm tubes. It can be mounted at five different locations of a vehicle; the four corners of the roof for the HMMWV variants (M1025/1026 and M1114) or a single discharger mounted on the turret ring of the M966. By mounting four dischargers on the vehicle, 360 degrees of coverage is obtained.

c. The M90 grenade is part of the LVOSS. The M90 grenade was integrated into the other LVOSS components to form a complete system. The M90 grenades are fired from within the vehicle via the A/FU.

d. The M90 LVOSS grenade is a soft-launched, nonfragmenting, pyrotechnic smoke dispenser. The grenade is constructed to include three individual dual-ported, core-burning smoke canisters. The smoke canisters contain a terephthalic acid-based smoke composition and are ejected by a charge of black powder. The canisters are ignited upon launch by an ignition patch located in the center of the canisters. The black powder ignition/expulsion charge is ignited by an electric match that is resistant to initiation by stray electric currents and radio frequency energy. The female connector at the base of the cartridge makes an electrical connection with the firing circuit when it is pushed onto the male electrical connector at the base of the discharger tube. When the circuit is aimed and the firing button(s) is (are) pushed, the firing circuit directs electrical energy from the vehicle's batteries to the electric match inside the propulsion cap. The electric match heats up and ignites the black powder inside the propulsion cap. The ignition patch ignites the smoke canisters through a hole in the center of each canister. The hot gases also push the smoke canisters out of the grenade tubes. The smoke canisters produce white smoke for about 14 seconds. When fired from the LVOSS discharger, the canisters travel to an average distance of 35±5 meters.

e. Dummy grenades used during testing were of the same configuration as the M90 grenade except that the grenade canisters were weighted with inert material.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- LVRS-II

**Reference** (Ryan et al., 1998):

Ryan, M. C., Orange, C., Romanko, T., Wong, N., Winters, J., & Laughman, R. (1998). System Assessment (SA) for the Light Weight Video Reconnaissance System II (Lvrs-II): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

140300 - Recording and Playback Devices

150400 - Military Intelligence

Descriptors:

(U) \*IMAGE PROCESSING, \*TACTICAL RECONNAISSANCE, \*VIDEO SIGNALS, TEST AND EVALUATION, COMBAT SURVEILLANCE, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, LIGHTWEIGHT, FIELD EQUIPMENT, INFRARED RECONNAISSANCE

Identifiers:

(U) LVRS(LIGHTWEIGHT VIDEO RECONNAISSANCE SYSTEM)

**System Description:**

The baseline system (LVRS) will provide video capture and transmission capability for the reconnaissance platoon in light infantry battalions, the scout platoon in mechanized infantry battalions, and long range surveillance units. The system consists of two sub-systems, the Out Station (OS) and the Base Station (BS). The P3I for the LVRS (MicroRIT) uses the same camera source and same base station computer. However, the OS computers (OSC) for the LVRS and MicroRIT differ in physical design and functionality. The LVRS OSC weighs 9 pounds with battery. The operator uses a touch pen on a screen liquid crystal display (LCD) to operate the system. The MicroRIT OSC weighs 6 pounds with battery. The operator uses function buttons to operate the system.

**Out Station.** The Out Station can be carried and operated by one person with a SINCGARS very high frequency (VHF) radio (AN/PRC-119), a rucksack, and load bearing equipment. The OS consists of a computer, camcorder, battery, and battery adapter/charger, remote control unit (RCV), night vision system (NVS), and various cables. Using the Out Station, the individual soldier should be able to capture, store, compress, process, and transmit still-frame images. All components were designed for easy access from the carrying configuration in order to provide quick operation. The OS should not restrict the movement of the soldier either when the soldier is operating or transporting the system. Reduction in the weight of the MicroRIT OSC should further enhance soldier transportability.

**Base Station.** The Base Station (BS) is intended to be located at the Tactical Operations Center (TOC) in a high-mobility, multipurpose wheeled vehicle (HMMWV), M577 armored personnel carrier (APC), or S250 shelter. The BS receives the images transmitted from the OS. Then, the operator uses the BS to analyze, process, reproduce, and disseminate the images to the other TOCs. The BS is designed to receive, store, compress/decompress, process, print, and retransmit images. It is also designed to view live motion video when connected to the OS video camcorder. The BS is intended to provide sufficient performance and capacity to provide for the ability to upgrade to the Command, Control, Communications, Computers, and Intelligence (C4I) Technical Architecture (TA). This TA is currently being developed and implemented in all Army data transmission devices to provide a common operating environment throughout the battlefield.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- LWGM

**Reference** (Fendick et al., 2003):

Fendick, K., Zwicke, R., Ortiz-Santiago, M., & Reich, P. (2003). System Evaluation Report (SER) for the XM192 Lightweight Ground Mount (LWGM): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 33188884. DTIC ADB293364.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190600 - Guns

Descriptors:

(U) \*GROUND LEVEL, \*MACHINE GUNS, \*GUN MOUNTS, TEST AND EVALUATION, PORTABLE EQUIPMENT, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, RELIABILITY, ARMY EQUIPMENT, LIGHTWEIGHT, STORAGE, TRIPODS

Identifiers:

(U) LWGM(LIGHTWEIGHT GROUND MOUNT), XM-192 GUN MOUNTS

**System Description:**

The LWGM (Acquisition Category III) is a tripod mount designed to accept the M249 Light Machinegun (LMG) and the M240B MMG without adapters. The LWGM has a geometry that takes advantage of the full range and versatility of the M240B and M249 weapons, while allowing the weapon to maintain consistent elevation/depression throughout the full range of weapon traverse. The LWGM is intended to be a lighter replacement for the M122A1 Tripod. It is collapsible for transport and storage. Overall mount length will be 24 inches when folded/collapsed for transport. The LWGM has an integral traverse and elevation (T&E) mechanism with elevation and azimuth position indicators and weapon pointing capability with 1 mil fine adjustment. The T&E mechanism is designed to allow rapid and bold adjustments and display weapon elevation and azimuth information during adjustments.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- MALS

**Reference** (Chipman, 2001):

Chipman, M. (2001). System Evaluation Report (SER) for the Mobile Analytical Laboratory System. (MALS). Block 1: U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADC067038.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

150600 - Military Operations, Strategy and Tactics

Descriptors:

(U) \*MILITARY VEHICLES, \*MASS DESTRUCTION WEAPONS, \*SECURITY CLASSIFICATION GUIDES, CHEMICAL AGENT DETECTORS, BIOLOGICAL AGENT DETECTORS

Identifiers:

(U) MALS(MOBILE ANALYTICAL LABORATORY SYSTEM)

**System Description:**

Mobile Analytical Laboratory System. (MALS). Block 1.

**Report Availability:**

Secret/NoForN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- MASH

**Reference** (Lyon, 1979):

Lyon, D. K. (1979). System Evaluation Report (SER) for the Mobile Army Surgical Hospital TTOE 8-063T. (MASH) (U): U.S. Army Training and Doctrine Command, ATTN: ATCS-D, Fort Monroe, VA 23651. DTIC ADB045177.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

060500 - Medicine and Medical Research

Descriptors:

(U) \*HOSPITALS, DEPLOYMENT, MILITARY REQUIREMENTS, MOBILE, THERAPY, RATINGS, FIELD ARMY, MEDICAL PERSONNEL, SURGERY, MEDICAL EQUIPMENT, EVACUATION, FIELD CONDITIONS, MAINTENANCE, PATIENTS

Identifiers:

(U) MASH(MOBILE ARMY SURGICAL HOSPITAL)

**System Description:**

The MASH was conceived and used extensively during the Korean Conflict but had never been formally tested. In March 1978 the Surgeon General directed the Academy of Health Sciences, United States Army, to revise TOE and doctrine for the MASH and the combat support hospital in order to alleviate some of the combat zone hospitalization support problems uncovered during the test of a combat support hospital in 1977 at Fort Hood, Texas. Logistical demands, deployability shortcomings, technical sophistication, and heat and noise signatures limited the flexibility and versatility essential for a forward medical treatment facility to operate in a rapidly changing combat situation. Based upon these factors, United States Army Training and Doctrine Command (TRADOC), Combined Arms Testing Activity (TCATA) was tasked to test a 60-bed MASH.

When the MASH is assigned to a medical brigade, it is attached to a medical group for command and control. Normally, two MASH's, one modified combat support hospital, and one evacuation hospital are allocated in support of a division. Both MASH's are routinely employed in proximity to the rear boundary of the supported division. Under certain tactical conditions, an increased patient load may make it necessary for the MASH to be employed forward of the rear boundary of the division. The modified combat support hospital routinely provides hospitalization for nonacutely injured patients from the division and corps units. It can also provide resuscitative care. Normally, the combat support hospital will not be in the treatment and evacuation chain for patients evacuated from the MASH. The MASH has no formal evacuation policy or length of stay. Evacuation from the MASH is dependent upon the condition of the patient, availability of beds, and availability of evacuation assets. Patients stabilized at the MASH will be routinely evacuated to the evacuation hospital for definitive treatment and further evacuation from the combat zone.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- MDARS-E

**Reference** (Frazier et al., 2000):

Frazier, T., Walker, T., Knuckles, S., & Flory, T. (2000). System Evaluation Report (SER) for the Mobile Detection Assessment Response System (MDARS) - Exterior: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 10058358. DTIC ADB263013.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

120900 - Cybernetics

150500 - Logistics, Military Facilities and Supplies

170500 - Optical Detection and Detectors

170800 - Miscellaneous Detection and Detectors

Descriptors:

(U) \*INTRUSION DETECTION, \*ANTIINTRUSION DEVICES, \*PERSONNEL DETECTION, TEST AND EVALUATION, LOGISTICS SUPPORT, MILITARY REQUIREMENTS, OPERATIONAL READINESS, PATROLLING, ROBOTS, SUPPLY DEPOTS

Identifiers:

(U) EXPORT CONTROL, MDARS-E(MOBILE DETECTION ASSESSMENT RESPONSE SYSTEM EXTERIOR)

**System Description:**

The MDARS-E system nominally consists of an MDARS control station and four remote vehicles (patrol vehicles) each equipped with a mission payload suite. The control station consists of a console from which an operator can monitor and control the functions of the patrol units. The patrol unit is a diesel powered, four-wheeled, all terrain, hydrostatically driven vehicle with an onboard navigation subsystem, communications subsystem, obstacle avoidance subsystem, and the mission payload suite consisting of intrusion detection and assessment, barrier assessment, and product assessment systems. The MDARS-E will provide commanders with a capability to detect personnel who have obtained unauthorized access to a facility, to verify the status of barriers, to conduct product inventories, and to investigate the source of alarms from remote locations before dispatching armed guards to the scene.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- MDARS-I

**Reference** (Brown et al., 1998):

Brown, P. L., Barrett, C. J., Wong, N. G., Player, F. D., & Beran, G. B. (1998). System Evaluation Report (SER) for the Mobile Detection Assessment Response System - Interior (MDARS-I): U.S. Army Operational Test and Evaluation Comd., ATTN: CSTE-XXX-XXX, Part Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. USAEAC. Report #: 80628096 / SER 13 Feb 98. DTIC ADB233512.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

120800 - Computer Systems Management and Standards

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*ROBOTICS, \*DETECTION, \*DATA PROCESSING SECURITY, \*INVENTORY CONTROL, TEST AND EVALUATION, CONTROL, STATIONS, AUTOMATION, NAVY, SECONDARY, SECURITY, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, PLATFORMS, MOBILE, COMMUNICATIONS NETWORKS, MISSIONS, MANAGEMENT PERSONNEL, NAVAL WARFARE, SYSTEMS ANALYSIS, MILITARY POLICE

Identifiers:

(U) PM-PSE(PRODUCT MANAGER PHYSICAL SECURITY EQUIPMENT), MDARS-J(MOBILE DETECTION ASSESSMENT RESPONSE SYSTEM-INTERIOR)

**System Description:**

The MDARS-I is an automated robotic security and inventory system consisting of a monitor panel (control station), multiple mobile platforms, dedicated recharging stations, and communication links between the monitor panel and the mobile platforms. Designed as a modular system, it can accept a variety of system, subsystem, and component improvements and configuration changes without major redesign.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

**System Short Name:** SER- Medical- CEIS-NT

**Reference** (OPTEC, 1997):

OPTEC. (1997). System Evaluation Report (SER) for the Corporate Executive Information System - near Term (Ceis-Nt) Version (V.) 0.3 Government Installation Acceptance Test (Giat): U.S. Army Test and Evaluation Command (ATEC) (Formerly U.S. Army Operational Test and Evaluation Command- OPTEC), ATTN: CSTE-EAC-CC, Park Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB228952

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

050100 - Administration and Management

060500 - Medicine and Medical Research

120700 - Computer Systems

Descriptors:

(U) \*DISTRIBUTED DATA PROCESSING, \*MILITARY MEDICINE, \*CORPORATE INFORMATION MANAGEMENT, \*DECISION SUPPORT SYSTEMS, TEST AND EVALUATION, DATA BASES, MILITARY REQUIREMENTS, DATA MANAGEMENT, COST ANALYSIS, OPERATIONAL EFFECTIVENESS, SYSTEMS ANALYSIS, HEALTH CARE MANAGEMENT

Identifiers:

(U) CEIS(CORPORATE EXECUTIVE INFORMATION SYSTEM)

**System Description:**

CEIS is programmed for development through fiscal year (FY) 2001. CEIS is an open and distributed system. CEIS integrates an Executive Information System (EIS) and a Decision Support System (DSS) that provide timely, accurate, and accessible management information for all authorized users within MHSS. Major CEIS end-user types include commanders, staff, resource and program management "analysts," and physician and clinician health care "providers." CEIS is operated by users from their workstations to access and analyze information necessary for high-quality, cost-effective managed health care. CEIS is maintained by system and database administrators. CEIS maximizes the use of commercial off-the-shelf (COTS) and government off-the-shelf (GaTS) products. EIS is supported by the COTS HBOC Quantum (brand name) product. DSS is supported by the COTS HBOC Trendpath (brand name) product. These HBOC products are the commercial leaders in their markets with approximately 700 civilian hospitals and health management organizations using them. CEIS must operate within GaTS communications infrastructure, use GaTS interface software, and operate upon GaTS computer hardware at MHSS sites. CEIS is a Defense Information Infrastructure (DII) migration system that will absorb the valued standard and ad hoc report functionality of eight legacy health care information systems. CEIS is planned to achieve level 5 compliance with the DII Common Operating Environment (COE) within one year of the approval of a COTS kernel that will support level 5 compliance. A kernel is the core part of an operating system.

CEIS-NT V. 0.3. If fielded as production increment CEIS-NT V. 1.0, CEIS-NT V. 0.3 will establish the baseline of CEIS for further development under acquisition policy. It will also become the core system for the future OT&E of CEIS in accordance with (IAW) the Guideline for Conducting Operational Test and Evaluation for Software-Intensive System Increments, 10 October 1996, from the Director, Operational Test and Evaluation (DOTE). Appendix C, Criteria Deferred from Operational Test and Evaluation until Later Increments (hereafter referred to simply as "Appendix C"), identifies those criteria or portions of criteria for the critical operational issues (COI) that were deferred from the OT&E reported here. Criteria or portions of criteria were deferred from OT&E only when they required capabilities or features planned for later CEIS increments. CEIS-NT V. 0.3 provides data from two new data sources of high priority to the FPWG, Ambulatory Data System (ADS) and Health Care Finance Administration (HCFA). CEIS-NT V. 0.3 is not a mature system. CE of the CEIS-NT V. 0.3 functional requirements and DT&E results to date finds 44 percent of those requirements (360 of 819) have been met. When applied to CEIS, the term "functional requirements" refers to requirements in the CEIS EIS and DSS Software Requirements Specifications dated 9 August 1996 and updated 20 June 1997. EIS has achieved 30 percent of its requirements (156 of 526), and DSS has achieved 70 percent of its requirements (204 of 293). CE found there were 20 sets of information still valid and required from. among the information reporting capabilities of the legacy

systems. Currently, EIS satisfies six, and DSS satisfies eight. If development follows the acquisition program baseline now in staffing, CEIS-NT V. 2.0 will satisfy approximately 60 percent of the CEIS requirements and five more of the valid information sets in FY 1998. The remaining requirements are projected for CEIS - Far Term (FT) development.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- MGPTS

**Reference** (Lee et al., 1999):

Lee, C., Finkel, M., Fujiwara, M., Riddick, R., & Mallamo, J. (1999). System Evaluation Report (SER) for the Modular General Purpose Tent System (MGPTS): U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 92118096. DTIC ADB245274.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

230400 - Protective Equipment

Descriptors:

(U) \*SHELTERS, \*TENTS, TEST AND EVALUATION, MARYLAND, LOGISTICS SUPPORT, MODULAR CONSTRUCTION

Identifiers:

(U) SER(SYSTEM EVALUATION REPORT), MGPTS(MODULAR GENERAL PURPOSE TENT SYSTEM)

**System Description:**

The MGPTS is intended to be a versatile and more habitable replacement for the General Purpose (GP) family of tents. The MGPTS is based upon a modular design that combines end and intermediate sections to form the desired tent size. Three specific size requirements: small (18 feet by 18 feet), medium (18 feet by 36 feet), and large (18 feet by 54 feet) have been identified. The MGPTS is expected to be supported by a pole system. It is extendible to any length required by adding modules and will be connected side to side through vestibules. The MGPTS will serve billeting, operational supply, field services, storage, and limited maintenance functions.

The MGPTS fabric is a coated polyester fabric which is intended to have a minimum of 3 years of service life. The fabric is currently used in the existing standard Tent, Extendable, Modular, Personnel (TEMPER), GP series, and Modular Command Post System (MCPS) in base camouflage green 483 and desert tan 459. The poles are aluminum.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- MIDS LVT

**Reference** (Pliscof et al., 2002):

Pliscof, M., Sheroke, B., Jones, M., Robinson, J., & Paulus, M. (2002). System Evaluation Report (SER) for the Multifunctional Information Distribution System - Low Volume Terminal (2) [MIDS LVT(2)]: U.S.

Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 30738790. DTIC ADB286549.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

120500 - Computer Programming and Software

170400 - Countermeasures

250200 - Radio Communications

Descriptors:

(U) \*ELECTRONIC WARFARE, \*COMMUNICATION TERMINALS, \*DISTRIBUTED INTERACTIVE SIMULATION, INPUT, DECISION MAKING, INFORMATION TRANSFER, SURVIVABILITY, TRACKING, LOW LEVEL, SURFACE TO AIR MISSILES, SYSTEMS ANALYSIS, PHASED ARRAYS, INFORMATION WARFARE

**System Description:**

The MIDS provides information distribution, position location, and identification capabilities within a common reference grid in an integrated form for tactical military operations. The nodeless system distributes encrypted information at high data rates and with jamming resistance sufficient to produce highly reliable communications in a hostile electromagnetic environment. The USN is the lead service for the MIDS program. The MIDS-Low Volume Terminal (MIDS-LVT(1) (USN), MIDS-LVT(2) (U.S. Army), and the MIDS Fighter Data Link (MIDS-FDL (LVT(3) (USAF) are the three current MIDS variants. The MIDS-LVT(2) terminal conforms to the basic fit, function, and weight requirements of the JTIDS 2M terminal, but is significantly less expensive due to multi-service (MS) buys and use of more modern technology. The MIDS-LVT(2) also differs from the JTIDS 2M terminal and the baseline MIDS-LVT terminal in that it includes a less restrictive power supply, making it more adaptable to different host platforms. The MIDS LVT(2) provides a joint and allied interoperable Link-16 tactical digital data communications link among air, ground, surface, and subsurface platforms. As a Link-16 terminal, it will continue to provide TADIL-J messages for engagement operations, command and control, surveillance, weapon status information, position, location and identification information, and SA to Army host platforms (PATRIOT) and to other air and surface users. The LVT(2) supports the Army's theater air defense and missile defense engagement operations and will have the capability to participate in a Link-16 network and exchange J-series messages with its host platforms.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- MILES AVCPS

**Reference** (Meirose et al., 1998):

Meirose, J. A., McCullum, D., & Knuckles, S. (1998). System Evaluation Report (SER) for the MILES 2000 Audio/Visual Cue Pyrotechnic Simulators: U.S. Army Operational Test and Evaluation Comd., ATTN: CSTE-XXX-XXX, Part Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. USAEAC, APG, MD. Report #: 83627046 / SER 11-98. DTIC ADB240270.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

140200 - Test Facilities, Equipment and Methods

150600 - Military Operations, Strategy and Tactics

Descriptors:

(U) \*MILITARY REQUIREMENTS, \*SYSTEMS ANALYSIS, \*MILITARY TRAINING, \*PYROTECHNICS, TEST AND EVALUATION, SIMULATORS, METHODOLOGY, LASERS, OPERATIONAL EFFECTIVENESS, LASER APPLICATIONS, AUDIOVISUAL AIDS

Identifiers:

(U) XM30, MILES(MULTIPLE INTEGRATED LASER ENGAGEMENT SYSTEM)

**System Description:**

Effectiveness for the DIFCUE-AVCPS and MGSS-AVCPS is defined by the demonstrated ability of the pyrotechnics to be seen and heard by other force-on-force combatants in the engagement area. In order to successfully demonstrate operational effectiveness, the DIFCUE-AVCPS must generate a flash of at least 330kcd at 20 meters, a bang of at least 135dB peak  $\pm$  15dB at 2 meters, and a smoke cloud that is visible and consistent. In order to successfully demonstrate operational effectiveness, the MGSS-AVCPS must generate a flash of at least 660kcd at 20 meters, a bang of at least 135dB peak  $\pm$  15 /-10dB at 20 meters, and a smoke cloud that is visible and consistent.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Mine Detector- FOMD

**Reference** (Arnold, 2004):

Arnold, R. (2004). System Evaluation Report (SER) for the Milestone C Decision for the Family of Metal Detectors (FOMD) / Abbreviated (ASER): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB301025.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

170600 - Magnetic & Electric Field Detection & Detectors

Descriptors:

(U) \*METAL DETECTORS, TEST AND EVALUATION, DETECTION, DECISION MAKING, SURVIVABILITY, CODING, ARMY EQUIPMENT, LIMITATIONS, SYSTEMS ANALYSIS

Identifiers:

(U) FOMD(FAMILY OF METAL DETECTORS)

**System Description:**

The FOMD consists of two types of metal detectors: compact and large wand. The compact metal detector is carried on the Soldier's person at all times and can be used when needed. It is attached to the equipment belt and immediately available when not being used. Personal security of the Soldier will be enhanced if this metal detector's primary method of alerting the operator is by vibration instead of by visual or audible cues. This capability gives the Soldier the ability to detect dangerous or prohibited items without alerting the individual being searched. The large wand metal detector is for higher-volume searches where screening for weapons is the primary objective. Its larger size provides a visible means of deterrence by being easily identified from a distance by potential belligerents. The FOMD is intended to detect:

- Items used as weapons such as ceramic hand guns containing metal, metallic hand guns, knives, razor blades, ice picks.
- Tools/aids for escape such as handcuff keys, paper clips, and straight pins.
- Small metal objects that are prohibited or restricted such as legal or illegal drugs hidden in foil, bullets, jewelry, etc.

Normal search areas are clothing and surfaces of the body to include hair and the mouth cavity. The FOMD candidates submitted for test were commercial off-the-shelf (COTS), nondevelopmental items.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- ABM- THAAD

**Reference** (Wolchak et al., 2009):

Wolchak, M., Escudero, L., Ploskonka, D., Sheroke, B., Hercules, J., Mares, A., Yelder, R., & Clowes, W. (2009). Operational Test Agency Assessment Report (OAR) for the Terminal High Altitude Area Defense (THAAD) (2008): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. DTIC ADC078356.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA), OTA Assessment Report (OAR), OTA Milestone "x" Assessment Report (OMAR), OTA Evaluation Report (OER), OTA Follow-on Evaluation Report (OFER), Operational Test Report (OTR), Abbreviated Operational Test Report (AOTR), Army Input to the OTA Report (AIOR)

\*terminal defense, \*antimissile defense systems, \*area defense, \*weapon system effectiveness, defense planning, guided missile ranges, flight testing(guided missiles), interoperability, test and evaluation, high altitude

Fields and Groups:

150301 - Antimissile Defense Systems

Descriptors:

(U) \*TERMINAL DEFENSE, \*ANTIMISSILE DEFENSE SYSTEMS, \*AREA DEFENSE, \*WEAPON SYSTEM EFFECTIVENESS, DEFENSE PLANNING, GUIDED MISSILE RANGES, FLIGHT TESTING(GUIDED MISSILES), INTEROPERABILITY, TEST AND EVALUATION, HIGH ALTITUDE

**System Description:**

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- Air Defense- Avenger

**Reference** (Cunningham et al., 1999):

Cunningham, E., Morrissey, M., Hess, L., Wald, L., Reza, J., Raleigh, D., Flory, T., McCarrell, D., & Warrington, D. (1999). System Assessment (SA) for the Forward Area Air Defense (FAAD) Line-of-Sight (LOS) Avenger [Slew-to-Cue (STC)]: U.S. Army Test and Evaluation Command (ATEC) (Formerly U.S. Army Operational Test and Evaluation Command- OPTEC), ATTN: CSTE-EAC-CC, Park Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

150302 - Antiaircraft Defense Systems

190500 - Fire Control and Bombing Systems

Descriptors:

(U) \*ANTIAIRCRAFT DEFENSE SYSTEMS, \*FORWARD AREA AIR DEFENSE SYSTEMS, TEST AND EVALUATION, LINE OF SIGHT, SURVIVABILITY, COMPUTERS, OPERATIONAL EFFECTIVENESS, MILITARY CAPABILITIES, SLEWING, CUEING, ANTI-AIRCRAFT FIRE CONTROL SYSTEMS

Identifiers:

(U) STC(SLEW TO CUE), AVENGER STC, SYSTEM ASSESSMENT, STINGER MISSILES

### **System Description:**

#### **The AVENGER originated as the FAAD-designated LOS-R weapon system.**

Objective AVENGER. The objective AVENGER configuration includes eight ready-to fire STINGER missiles, and a .50 caliber machine gun integrated with sensors and target acquisition devices. The Identification Friend or Foe (IFI), Forward Looking Infrared (FLIR), and a Laser Range Finder (LRF) provide the functions necessary to perform day/night and limited adverse weather target detection, acquisition, tracking, target ranging, and friend or foe AC identification for engaging hostile targets with either missiles or machine gun. The AVENGER target set includes both Lightly Armored Ground Targets, FW, RW, UAV, and CM AC. A manual interface with the FAADS C2I System is provided for with the addition of the Single Channel Ground and Airborne Radio System (SINCGARS) or Enhanced Position Location Reporting System (EPLRS) radio. This interface allows for the receipt and display of AC early warning data on the FAAD C2I Simplified Handheld Terminal Unit (SHTU) or Handheld Terminal Unit (HTU). A Global Positioning System (GPS) receiver and North Seeking Gyro system provides positional information for manual input to the AVENGER Computer Electronics (ACE) through the use of the SHTU/HTU. Remote operation of the AVENGER can be accomplished using the Remote Control Unit (RCU). The RCU is designed with an integrated monitor and keypad to facilitate communications with the C2I system and utilize system fire control information. An integrated Environmental Control Unit/Prime Power Unit (ECU/PPU) furnishes electrical power independent of the carrier electrical power and environmentally conditions the turret so operations can be sustained in extreme ambient temperatures. The AVENGER Standard Vehicle Mounted Launcher can interface and function with standard, unmodified Basic STINGER, STINGER POST, and STINGER-Reprogrammable Microprocessor missile rounds. The system is mounted on a High Mobility Multipurpose Wheeled Vehicle - Heavy Version, and its two-man crew can fire from a stationary position, while on the move, or from a remote position. The AVENGER also has the capability to convert to the Man-Portable Air Defense System.

#### **System Description STC.**

**a. STC is an AVENGER air defense system** enhancement which accepts digital radar track data through the FAAD C2I system and automatically positions (slews) the AVENGER turret in azimuth and elevation, placing a selected target in the gunner's field-of-view (FOV). The STC kit provides the AVENGER with enhanced situational awareness and aerial target engagement opportunities that result in significantly increased numbers of engagement opportunities' and kills.

**b. The AVENGER STC system** consists of the Basic AVENGER turret with an upgraded computer, the AVENGER Fire Control Computer (AFCC), a Targeting Console (TC) which replaces the Control Display Terminal, a Land Navigation System (LNS), and an interface to FAAD C2I data. The AFCC and the TC are the main controls and interfaces to the AVENGER turret operator. The LNS interface with the FAAD C2I system allows the driver to select a target, slew the AVENGER to the target, and initiate a firing sequence, while either on the move or stationary.

### **Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- Air Defense- PATRIOT

### **Reference** (Welch et al., 2007):

Welch, K. D., Segarra, R., Pliscof, M., Wu, Y.-H., Dombeck, N., Szekerczes, J., Heasley, J. S., Riverra, E., White, C., Ploskonka, D., Reza, J., Mares, A., Elowitz, W., & Squire, C. (2007). System Assessment (SA) for the Patriot Post-Deployment Build (PDB-6) Limited User Test (LUT) (U): U.S. Army Test and

Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report # 71349955. Report Classification: SECRET. Citation Classification: Unclassified.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

**System Description:**

Patriot Post-Deployment Build (PDB-6) Limited User Test (LUT).

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- Air Defense- PATRIOT MEADS

**Reference** (Armstrong et al., 2004):

Armstrong, Willard, J., Burton, H., Wu, Y., & DiRocco, T. (2004). System Evaluation Report (SER) for the Patriot/Medium Extended Air Defense System (MEADS) Combined Aggregate Program (CAP): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 42497887. DTIC ADB302359.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

150301 - Antimissile Defense Systems

Descriptors:

(U) \*AIR DEFENSE, \*BALLISTIC MISSILE INTERCEPT SYSTEMS, GUIDED MISSILES, GROUND LEVEL, MOBILITY, THEATER LEVEL OPERATIONS, DETECTORS, THREATS, RADAR, HELICOPTERS, CRUISE MISSILES, SURFACE TO AIR MISSILES, SHORT RANGE(DISTANCE), FIXED WING AIRCRAFT, TACTICAL WARFARE, TACTICAL WEAPONS, AIRLIFT OPERATIONS

**System Description:**

The MEADS system is an air defense radar and interceptor system meant to deal with theater threats including fixed and rotary wing aircraft, cruise missiles, and tactical ballistic missiles. The CAP is based on the concept that the MEADS objective capability will evolve through insertion of MEADS MEIs to the current PATRIOT system. MEADS offers a significant improvement in tactical mobility and strategic deployability because it requires 50 percent less airlift than PATRIOT and is intra-theater transportable with C-130s and helicopters. MEADS provides continuous coverage alone or can integrate with SHORAD systems in the corps and division area. MEADS uses a netted and distributed architecture with modular, configurable battle elements. These attributes allow the MEADS system to integrate with other airborne and ground-base sensors to provide a robust, 3600 defense.

1.4.1 Battery Concept. The MEADS Battery (fire unit) is not completely defined at the present time; therefore, the battery concept as shown in figure 1-3 is an estimate of the composition of the actual fielded MEADS Battery. The battery concept consists of the following: one SR, two MFCRs, one or two TOC s, and several launchers. The SR and MFCRs will all rotate to allow for 3600 coverage. A MEADS battalion will consist of several batteries.

1.4.2 Plug-and-Fight Capability. The MEADS system provides a flexible and rapid response air defense system, which is highly mobile and capable of defending an advancing ground force. All MEIs will be 'plug-and-fight' capable and will be attached to the high-speed MEADS Intra Network. The 'plug-and-fight' capability provides the flexibility to integrate different quantities of MEADS MEIs to accomplish specific missions, and also allows other external air defense systems with similar netted capability (e.g., Surface-Launched Advanced Medium Range Air-to-Air Missile, Joint Land Attack Cruise Missile Defense Elevated Netted Sensor) to be integrated into the MEADS architecture.

1.4.3 Radar. One of the major advances of the MEADS system over current air defense systems is its use of Adaptive Digital Beam Forming (ADBF) radars. These ADBF radars are a relatively new design concept with many experimental systems being developed by a number of different countries. Some of these countries have near-term production goals. The ADBF array design is a natural progression from the existing analog phased array radars in operation today, as in the PATRIOT air defense system. What sets the ADBF design from its predecessors is that the main array is comprised of many sub-arrays that can be physically configured and adapted in any number of ways to optimize radar performance (e.g., better search efficiency, jammer cancellation, and clutter attenuation).

a. The MFCR is proposed to have more than 10,000 antenna elements operating in the X-Band, and will use a joint analog/digital adaptive beam-forming architecture. This architecture represents a major technological advance in radar performance, particularly in capability against electronic countermeasures threats and increased multifunction efficiency. The SR is proposed to have 144 antenna elements operating in the ultra high frequency (UHF) band. Currently, a decision is pending on whether the SR will use the joint analog/digital adaptive beam-forming network or a pure digital adaptive beam forming network.

b. The MFCRs will have the following capabilities.

- Large power aperture active phased array X-Band radar with identification, friend or foe (IFF) sensor.
- Digital Beam Forming.
- Multi mode operation.
- 360° coverage.
- Self contained alignment.
- Mobile and transportable.
- Cross country/truck mounted.
- C-130 roll-on/roll-off (RO/RO).

c. The SR will have the following capabilities.

- Pulsed Doppler Phased array UHF Band radar with IFF sensor.
- Digital Beam Forming.
- Multi-mode operation.
- 360° coverage with an optional fixed 90° sector operation.
- Self-contained alignment.
- Mobile and transportable.
- Cross country/truck mounted.
- C-130 RO/RO. 1

1.4.4 Tactical Operations Center. The TOC is the proposed BMC41 system and will perform both MEADS Battery and Battalion duties. The TOC will have the following capabilities:

- Dynamic Force Tailoring.
- Automatic initialization.
- Reconfigurable/Plug and Fight. Netted and Distributed.
- The netted sensors provide continuous and redundant target tracking.
- Distributed battle elements put the best weapon on target.
- Eliminates single point of failure. • Battalion-level TOC coordinates external track data.

1.4.5 Launcher and Missile. The launchers are planned to support vertical launch. The exact number of missiles and missile load-out is unknown at this time. The PAC-3 MSE missile will most likely be the missile of choice, though it is possible the Cost Reduction Initiative (CRI) PAC-3 will be the MEADS objective system interceptor. The launcher and missile will have the following capabilities:

- Mobile and transportable.
- Cross country/truck mounted.
- C-130 RO/RO.
- Self-contained alignment.
- Erects to vertical or near vertical launch for 360° coverage.
- PAC-3 missile compatible.
- Hit-to-kill missile.
- Proven technology.
- Palletized handling system or crane loaded.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or

potentially significant military application. Other requests for this document must be referred to  
Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- Air Defense- PATRIOT MEADS LSAC-M

**Reference** (ATEC, 2008):

ATEC. (2008). Operational Test Agency Assessment Report (OAR) for the Design and Development Phase. Medium Extended Air Defense System (MEADS) XM1160 with the Low Signature Armored Cab (LSAC-M) Crew Survivability: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. DTIC ADC077201.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA), OTA Assessment Report (OAR), OTA Milestone "x" Assessment Report (OMAR), OTA Evaluation Report (OER), OTA Follow-on Evaluation Report (OFER), Operational Test Report (OTR), Abbreviated Operational Test Report (AOTR), Army Input to the OTA Report (AIOR)

\*armored vehicles, \*signatures, \*military vehicles, mine countermeasures, explosive charges, crews, small arms, survival(personnel), ballistics, confidence level, grenades, firing tests(ordnance), mines(ordnance), survivability, threats  
m-1160 vehicles, ied(improvised explosive devices), himars(high mobility artillery rocket system), lsac(low signature armored cab), meads(medium extended air defense system)

Fields and Groups:

190300 - Combat Vehicles

Descriptors:

(U) \*ARMORED VEHICLES, \*SIGNATURES, \*MILITARY VEHICLES, MINE COUNTERMEASURES, EXPLOSIVE CHARGES, CREWS, SMALL ARMS, SURVIVAL(PERSONNEL), BALLISTICS, CONFIDENCE LEVEL, GRENADES, FIRING TESTS(ORDNANCE), MINES(ORDNANCE), SURVIVABILITY, THREATS

Identifiers:

(U) M-1160 VEHICLES, IED(IMPROVISED EXPLOSIVE DEVICES), HIMARS(HIGH MOBILITY ARTILLERY ROCKET SYSTEM), LSAC(LOW SIGNATURE ARMORED CAB), MEADS(MEDIUM EXTENDED AIR DEFENSE SYSTEM)

**System Description:**

Medium Extended Air Defense System (MEADS) XM1160 with the Low Signature Armored Cab (LSAC-M) Crew Survivability.

**Report Availability:**

Secret/NoForN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- Antitank- JAVELIN

**Reference** (Mahana et al., 1997):

Mahana, J. C., Bowman, L., Musser, D., Laughman, R., Ashcraft, J. G., West, R. M., Wood, G., White, D., & Duncan, B. R. (1997). System Assessment (SA) for the Javelin Anti-Armor Weapon System: U.S. Army Operational and Test Evaluation Command (OPTEC), Attn: CSTE-OEC-CCE-I, Park Center IV, Alexandria, VA 22302-1458. DTIC ADB231491.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

160402 - Surface-launched Guided Missiles

Descriptors:

(U) \*ANTITANK MISSILES, \*ANTITANK AMMUNITION, \*SHOULDER LAUNCHED WEAPONS, KILL PROBABILITIES, SURVIVABILITY, ANTIARMOR AMMUNITION, TARGET ACQUISITION, FIRING TESTS(ORDNANCE), RANGE(DISTANCE), ARMOR PIERCING AMMUNITION, HIT PROBABILITIES, ANTITANK WARFARE, FIRE AND FORGET WEAPONS

**System Description:**

**Equipment.** The JAVELIN is a manportable, fire-and-forget, antitank weapon system consisting of a round (missile and launch tube), and a reusable CLU The training system includes a FTT and a tabletop Basic Skills Trainer (BST) The FTT has two configurations FTT-force on force (FTT-FoF) and FTT-Range. The FTT-FoF consists of a simulated round (SR) and CLU The FTT-Range consists of an SR, CLU and Instructor Station (IS) The FTT-FoF is used in tactical MILES play against opposing forces, whereas the FTT-Range is used on a range to enhance the gunner's performance with an instructor providing feedback through the use of an instructor station. The BST is used in a classroom setting and can be used for sustainment training.

**Employment.** Within the Army, the JAVELIN will be employed by dismounted infantrymen at platoon level and by combat engineers at division level. It will be deployed in the field by platoon/squad leaders and commanded by a team leader who will make mission assignments when engaging multiple armored targets. Marine Corps JAVELIN employment will be by antitank assault men of the antitank platoon of the infantry battalion weapons company.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- Antitank- JAVELIN

**Reference** (Bowman et al., 1997):

Bowman, L. A., Laughman, R., & Wood, G. (1997). System Evaluation Report (SER) for the Javelin Anti-Armor Weapon System Live Fire Test, Evaluation, and Lethality (U): U.S. Army Evaluation Analysis Center (EAC)., ATTN: CSTE-EAC-AV/CS, Aberdeen Proving Ground, MD 21005-3013. DTIC ADC060272.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

160402 - Surface-launched Guided Missiles

190100 - Ammunition and Explosives

190300 - Combat Vehicles

Descriptors:

(U) \*ANTIARMOR AMMUNITION, \*SURFACE TO SURFACE MISSILES, \*ANTITANK MISSILES, GUIDED MISSILES, SIMULATION, ARMOR, DAMAGE, GUIDED MISSILE WARHEADS, KILL PROBABILITIES, DEBRIS, THREATS, FIRING TESTS(ORDNANCE), PENETRATION, LETHALITY, SHAPED CHARGES, SYSTEMS ANALYSIS, GUIDED MISSILE TARGETS

**System Description:**

Javelin Anti-Armor Weapon System.

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this

document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- Antitank- JAVELIN

**Reference** (Heatwole et al., 1999):

Heatwole, C., White, D., Bowman, L., Laughman, R., Allen Orr, J., Tull, P., Musser, D., & Haynes, M. (1999). System Assessment (SA) for the Javelin Anti-Armor Weapon System FRP I Hardware: U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-EAC-RAM, Park Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB243823.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

160402 - Surface-launched Guided Missiles

Descriptors:

(U) \*ANTITANK MISSILES, TEST AND EVALUATION, DECISION MAKING, PRODUCTION, SURVIVABILITY, WEAPON SYSTEMS, RELIABILITY, CONFIGURATIONS, LAUNCHING, SYSTEMS ANALYSIS

Identifiers:

(U) JAVELIN MISSILES, EPP(ENHANCED PRODUCTIVITY PROGRAM)

**System Description:**

The JAVELIN is a manportable, fire-and-forget, anti-tank weapon system consisting of a round (missile and launch tube) and a reusable CLU. The training system includes a Field Tactical Trainer (FTT) and a table-top Basic Skills Trainer (BST). The FTT has two configurations: FTT Force-on-Force (FTT-FOF) and FTT-Range (FTTRG). The FTT-FOF consists of a Simulated Round (SR) and a CLU. This training configuration is also referred to as the Student Station. The FTT-Range consists of an SR, a CLU, and an Instructor's Station (IS). The FTT-FOF is used in tactical MILES play against opposing forces, whereas the FTT-Range is used on a range to enhance the gunner's performance with an instructor providing feedback through the use of an IS. The BST is used in a classroom setting and can be used for sustainment training.

Employment. JAVELIN is a medium range anti-tank weapon system that replaces DRAGON. It also provides a secondary capability against helicopters and bunkers. It is being produced for both US Army and Marine Corps employment. Within the Army, the JAVELIN will be employed by dismounted infantrymen at platoon level and by combat engineers at divisional level. It will be deployed in the field by platoon/squad leaders and commanded by a team leader who will make mission assignments when engaging multiple armored targets. Marine Corps JAVELIN employment will be by anti-tank assaultmen of the anti-tank platoon of the infantry battalion weapons company.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- Antitank- JAVELIN

**Reference** (Oliver et al., 2000):

Oliver, S., Heatwole, C., Raleigh, D., Bowman, L., Laughman, R., Musser, D., Haynes, M., & McFassel, J. (2000). System Assessment (SA) for the Javelin Anti-Armor Weapon System Full-Rate Production I Missile: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB258993.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)  
Fields and Groups:

160402 - Surface-launched Guided Missiles

Descriptors:

(U) \*ANTIARMOR AMMUNITION, \*SURFACE TO SURFACE MISSILES, TEST AND EVALUATION,  
INPUT, GUIDED MISSILES, EXPERIMENTAL DATA, DECISION MAKING, GUIDED MISSILE  
LAUNCHERS, SURVIVABILITY, RELIABILITY, CONFIGURATIONS, SYSTEMS ANALYSIS

Identifiers:

(U) EXPORT CONTROL, JAVELIN MISSILES

**System Description:**

**Equipment.** The JAVELIN is a manportable, fire-and-forget, anti-tank weapon system consisting of a round (missile and launch tube) and a reusable CLU. The training system includes a Field Tactical Trainer (FTT) and a table-top Basic Skills Trainer (BST). The FTT has two configurations: FTT Force-on-Force (FTT-FOF) and FTT-Range (FTTRG). The FTT-FOF consists of a Simulated Round (SR) and a CLU. This training configuration is also referred to as the Student Station. The FTT-RG consists of an SR, a CLU, and an Instructor's Station (IS). The FTT-FOF is used in tactical Multiple Integrated Laser Engagement System (MILES) play against opposing forces, whereas the FTT-RG is used on a range to enhance the gunner's performance with an instructor providing feedback through the use of an IS. The BST is used in a classroom setting and can be used for sustainment training.

**Employment.** The JAVELIN is a medium-range anti-tank weapon system that replaces the DRAGON. It also provides a secondary capability against helicopters and bunkers. It is being produced for use by both the U.S. Army and U.S. Marine Corps. Within the Army, the JAVELIN will be employed by dismounted infantrymen at platoon level and by combat engineers at divisional level. It will be deployed in the field by platoon/squad leaders and commanded by a team leader who will make mission assignments when engaging multiple armored targets. Marine Corps JAVELIN employment will be by antitank assaultmen of the anti-tank platoon of the infantry battalion weapons company.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- Antitank- JAVELIN

**Reference** (O'Brien et al., 2000):

O'Brien, M., Heatwole, C., Raleigh, D., Bowman, L., Laughman, R., Musser, D., Haynes, M., & McFassel, J. (2000). *System Assessment (SA) for the Javelin Reliability and Availability Maturity*: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA DTIC ADB264023.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

**System Description:**

The JAVELIN is a manportable, fire-and-forget, anti-tank weapon system consisting of a round (missile and launch tube) and a reusable CLU. The training system includes the FTT and the BST. The FTT has two configurations: FTT-FOF and FTT-RG. The FTT-FOF consists of an SR and a CLU. This training configuration is also referred to as the Student Station. The FTT-Range consists of an SR, a CLU, and an IS. The FTT-FOF is used in tactical Multiple Integrated Laser Engagement System (MILES) play against opposing forces, whereas the FTT-RG is used on a range to enhance the gunner's performance with an instructor providing feedback through the use of an IS. The BST is a table-top trainer used in a classroom setting and can be used for sustainment training.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- Antitank- JAVELIN

**Reference** (Smith et al., 2001):

Smith, M., Heatwole, C., Raleigh, D., Bowman, L., Laughman, R., Musser, D., Haynes, M., & McFassel, J. (2001). System Assessment (SA) for the Javelin Anti-Armor Weapon System Full-Rate Production II Missile: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. AEC, APG, MD. DTIC ADB268026.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

160402 - Surface-launched Guided Missiles

Descriptors:

(U) \*ANTIARMOR AMMUNITION, \*SURFACE TO SURFACE MISSILES, TEST AND EVALUATION, INPUT, GUIDED MISSILES, EXPERIMENTAL DATA, DECISION MAKING, GUIDED MISSILE LAUNCHERS, SURVIVABILITY, RELIABILITY, CONFIGURATIONS, SYSTEMS ANALYSIS

Identifiers:

(U) JAVELIN MISSILES

**System Description:**

**Equipment.** The JAVELIN is a manportable, fire-and-forget, anti-tank weapon system consisting of a round (missile and launch tube) and a reusable CLU. The training system includes a Field Tactical Trainer (FTT) and a table-top Basic Skills Trainer (BST). The FTT has two configurations: FTT Force-on-Force (FTT-FOF) and FTT-Range (FTTRG). The FTT-FOF consists of a Simulated Round (SR) and a CLU. This training configuration is also referred to as the Student Station. The FTT-RG consists of an SR, a CLU, and an Instructor's Station (IS). The FTT-FOF is used in tactical Multiple Integrated Laser Engagement System play against opposing forces, whereas the FTT-RG is used on a range to enhance the gunner's performance with an instructor providing feedback through the use of an IS. The BST is used in a classroom setting and can be used for sustainment training.

**Employment.** The JAVELIN is a medium-range anti-tank weapon system that replaces the DRAGON. It also provides a secondary capability against helicopters and bunkers. It is being produced for use by both the U.S. Army and U.S. Marine Corps. Within the Army, the JAVELIN will be employed by dismounted infantrymen at platoon level and by combat engineers at divisional level. It will be deployed in the field by platoon/squad leaders and commanded by a team leader who will make mission assignments when engaging multiple-armored targets. Marine Corps JAVELIN employment will be by antitank assaultmen of the anti-tank platoon of the infantry battalion weapons company.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- Antitank- JAVELIN

**Reference** (Bowman et al., 2002):

Bowman, L., Heatwole, C., Patterson, W., Laughman, R., Haynes, M., & Lee, V. (2002). System Assessment (SA) for the Javelin Anti-Armor Weapon System Full-Rate Production 3 Missile with -079 and

Reworked -039 CESAF: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB283508.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

160402 - Surface-launched Guided Missiles

Descriptors:

(U) \*ANTIARMOR AMMUNITION, \*SURFACE TO SURFACE MISSILES, TEST AND EVALUATION, INPUT, GUIDED MISSILES, EXPERIMENTAL DATA, DECISION MAKING, GUIDED MISSILE LAUNCHERS, SURVIVABILITY, RELIABILITY, CONFIGURATIONS, SYSTEMS ANALYSIS

Identifiers:

(U) JAVELIN MISSILES

**System Description:**

**Equipment.** The JAVELIN is a manportable, fire-and-forget, anti-tank weapon system consisting of a round (missile and launch tube) and a reusable CLU. The training system includes a Field Tactical Trainer (FTT) and a table-top Basic Skills Trainer (BST). The FTT has two configurations: FTT Force-on-Force (FTT-FOF) and FTT-Range (FTTRG). The FTT-FOF consists of a simulated round (SR) and a CLU. This training configuration is also referred to as the Student Station. The FTT-RG consists of an SR, a CLU, and an Instructor's Station (IS). The FTT-FOF is used in tactical Multiple Integrated Laser Engagement System play against opposing forces, whereas the FTT-RG is used on a range to enhance the gunner's performance with an instructor providing feedback through the use of an IS. The BST is used in a classroom setting and can be used for sustainment training.

**Employment** The JAVELIN is a medium-range anti-tank weapon system that replaces the DRAGON. It also provides a secondary capability against helicopters and bunkers. It is being produced for use by both the U.S. Army and U.S. Marine Corps. Within the Army, the JAVELIN will be employed by dismounted infantrymen at platoon level and by combat engineers at divisional level. It will be deployed in the field by platoon/squad leaders and commanded by a team leader who will make mission assignments when engaging multiple-armored targets. Marine Corps JAVELIN employment will be by antitank assaultmen of the anti-tank platoon of the infantry battalion weapons company.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- Antitank- JAVELIN

**Reference** (Bowman et al., 2007):

Bowman, L., Scott, D., Pandullo, M., Davis, T., Bindel, S., & Lewis, J. (2007). System Assessment (SA) for the Javelin Antitank Weapon System (Block I) (U): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report # 71989976. Report Classification: SECRET. Citation Classification: Unclassified.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) From DTIC ADB283508 (U):

Fields and Groups:

160402 - Surface-launched Guided Missiles

Descriptors:

(U) \*ANTIARMOR AMMUNITION, \*SURFACE TO SURFACE MISSILES, TEST AND EVALUATION, INPUT, GUIDED MISSILES, EXPERIMENTAL DATA, DECISION MAKING, GUIDED MISSILE LAUNCHERS, SURVIVABILITY, RELIABILITY, CONFIGURATIONS, SYSTEMS ANALYSIS

Identifiers:

(U) JAVELIN MISSILES

**System Description:**

Javelin Antitank Weapon System (Block I) (U).

From DTIC ADB283508 (U):

**Equipment.** The JAVELIN is a manportable, fire-and-forget, anti-tank weapon system consisting of a round (missile and launch tube) and a reusable CLU. The training system includes a Field Tactical Trainer (FTT) and a table-top Basic Skills Trainer (BST). The FTT has two configurations: FTT Force-on-Force (FTT-FOF) and FTT-Range (FTTRG). The FTT-FOF consists of a simulated round (SR) and a CLU. This training configuration is also referred to as the Student Station. The FTT-RG consists of an SR, a CLU, and an Instructor's Station (IS). The FTT-FOF is used in tactical Multiple Integrated Laser Engagement System play against opposing forces, whereas the FTT-RG is used on a range to enhance the gunner's performance with an instructor providing feedback through the use of an IS. The BST is used in a classroom setting and can be used for sustainment training.

**Employment** The JAVELIN is a medium-range anti-tank weapon system that replaces the DRAGON. It also provides a secondary capability against helicopters and bunkers. It is being produced for use by both the U.S. Army and U.S. Marine Corps. Within the Army, the JAVELIN will be employed by dismounted infantrymen at platoon level and by combat engineers at divisional level. It will be deployed in the field by platoon/squad leaders and commanded by a team leader who will make mission assignments when engaging multiple-armored targets. Marine Corps JAVELIN employment will be by antitank assaultmen of the anti-tank platoon of the infantry battalion weapons company.

**Report Availability:**

Secret/NoForN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- Antitank- JAVELIN EPP

**Reference** (Mahana et al., 1998):

Mahana, J. C., Musser, D., Ashcraft, J. O., West, R. M., Bowman, L., Laughman, R., Wood, O., White, D., & Duncan, B. R. (1998). System Assessment (SA) for the Javelin Anti-Armor Weapon System Lrip III Configured Enhanced Producibility Program (EPP) Round U.S. Army Operational and Test Evaluation Command (OPTEC), Attn: CSTE-OEC-CCE-I, Park Center IV, Alexandria, VA 22302-1458. DTIC ADB234293.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

160402 - Surface-launched Guided Missiles

Descriptors:

(U) \*ANTIARMOR AMMUNITION, \*ANTITANK MISSILES, \*FIRE AND FORGET WEAPONS, TEST AND EVALUATION, SURVIVABILITY, FIRING TESTS(ORDNANCE), OPERATIONAL EFFECTIVENESS, WEAPON SYSTEM EFFECTIVENESS, MANPORTABLE EQUIPMENT, LAUNCH TUBES, SAFING AND ARMING(ORDNANCE)

Identifiers:

(U) JAVELIN MISSILES

**System Description:**

**Equipment.** The JAVELIN is a manportable, fire-and-forget, antitank weapon system consisting of a round (Missile and launch tube), and a reusable Command Launch Unit (CLU). The training system includes a Field Tactical Trainer (FTT) and a table top Basic Skills Trainer (BST). The FTT has two configurations: FTT-force on Force (FTT-FOF) and FTT-Range. The FTT-FOF consists of a Simulated Round (SR) and CLU. The FTT-Range consists of an SR, CLU and Instructor Station (IS). The FTT-FOF is used in tactical MILES play against opposing forces, whereas the FTT-Range is used on a range to

enhance the gunner's performance with an instructor providing feedback through the use of an instructor station. The BST is used in a classroom setting and can be used for sustainment training.

**Employment.** Within the Army, the JAVELIN will be employed by dismounted infantrymen at platoon level and by combat engineers at divisional level. It will be deployed in the field by platoon/squad leaders and commanded by a team leader who will make mission assignments when engaging multiple armored targets. Marine Corps JAVELIN employment will be by antitank assaultmen of the antitank platoon of the infantry battalion weapons company.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- Antitank- LOSAT

**Reference (ATEC, 2005):**

ATEC. (2005). System Evaluation Report (SER) for the Line-of-Sight Antitank Weapon System (LOSAT) (U): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADC071706.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

160400 - Guided Missiles

190500 - Fire Control and Bombing Systems

Descriptors:

(U) \*LINE OF SIGHT, \*ANTITANK MISSILES, TEST AND EVALUATION, KINETIC ENERGY, HYPERVELOCITY WEAPONS, SYSTEMS ANALYSIS, LOW RATE, GUIDED MISSILE SIMULATORS

Identifiers:

(U) LOSAT(LINE OF SIGHT ANTITANK)

**System Description:**

Line-of-Sight Antitank Weapon System (LOSAT).

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- Antitank- TOW 2B AERO GEN 1

**Reference (ATEC, 2002):**

ATEC. (2002). System Assessment (SA) for the Recommendation for the Materiel Release of 1,000 Retrofitted Tube-Launched, Optically-Tracked, Wire-Guided (TOW) 2B Generation (GEN I): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. APG, MD. Report # 20918629. Report Classification: SECRET/NOFORN. Citation Unclassified.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

**System Description:**

Recommendation for the Materiel Release of 1,000 Retrofitted Tube-launched, Optically-tracked, Wire-guided (TOW) 2B Generation (GEN I)

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET/NOFORN. Citation Classification: Unclassified.  
Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- Antitank- TOW 2B AERO GEN 2 CAPS

**Reference** (Bowman et al., 2009):

Bowman, L., Macfarlane, K., McKelvey, R., Lewis, J., Pappano, F., & Pandullo, M. (2009). Operational Test Agency Evaluation Report (OER) for the Tube-Launched, Optically Tracked, Wire-Guided (TOW) 2B Aerodynamic (AERO) Missile, and the Tow 2B Aero Gen2 Missile (Counter-Active Protection Systems (Caps) Version): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. DTIC ADB349403.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA), OTA Assessment Report (OAR), OTA Milestone "x" Assessment Report (OMAR), OTA Evaluation Report (OER), OTA Follow-on Evaluation Report (OFER), Operational Test Report (OTR), Abbreviated Operational Test Report (AOTR), Army Input to the OTA Report (AIOR)

\*optical tracking, \*guided missile tracking systems, \*tube launched, aerodynamic characteristics, operational effectiveness, survivability, release  
tow(tube launched optically tracked wire guided)

Fields and Groups:

160100 - Guided Missile Launching and Basing Support

160400 - Guided Missiles

170500 - Optical Detection and Detectors

Descriptors:

(U) \*OPTICAL TRACKING, \*GUIDED MISSILE TRACKING SYSTEMS, \*TUBE LAUNCHED, AERODYNAMIC CHARACTERISTICS, OPERATIONAL EFFECTIVENESS, SURVIVABILITY, RELEASE

Identifiers:

(U) TOW(TUBE LAUNCHED OPTICALLY TRACKED WIRE GUIDED)

**System Description:**

The mission of the TOW 2B Aero is to destroy armored targets at a greater maximum effective range than the TOW 2B (3,750 m). The missile may be fired from a variety to TOW platforms including: Bradley Fighting Vehicle System (BFVS) Infantry Fighting Vehicle (IFV) and Cavalry Fighting Vehicle (CFV), Stryker Anti-tank Guided Missile (ATGM) and United States Marine Corps (USMC) Light Armored Vehicle (LAV), the Improved Target Acquisition System (ITAS), the M220A2 TOW Launcher, and eventually will be fired from several Mine Resistant Ambush Protected (MRAP) platforms. The mission of the Gen2 is the same except that it will have the capability to defeat targets equipped with APS.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- Antitank- TOW FF

**Reference** (Bowman, 2000):

Bowman, L. (2000). System Evaluation Report (SER) for the TOW Fire and Forget (FF) System in Support of Milestone II: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 03638357. DTIC ADB261943.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

160401 - Air- and Space-launched Guided Missiles

Descriptors:

(U) \*WEAPON SYSTEM EFFECTIVENESS, \*SURFACE TO SURFACE MISSILES, LINE OF SIGHT, INTEGRATED SYSTEMS, KILL PROBABILITIES, SURVIVABILITY, TARGET SIGNATURES, TRAINING DEVICES, FIRING TESTS(ORDNANCE), TRACKING, THREAT EVALUATION, SYSTEMS ANALYSIS

Identifiers:

(U) TOW MISSILES, FIRE AND FORGET, LIVE FIRE

**System Description:**

The TOW F&F program has three major objectives. First, the program is designed to counter the near term (2005-2015) tank threat. This includes main battle tanks ranging from older basic or improved T-55 type tanks to basic and upgraded T-72/80/90's. This threat includes armored vehicles equipped with a variety of active and passive armor protection including improved armor, Active Protection Systems (APS), and Defensive Aides Suites (DAS). Second, the program will mitigate some light force survivability concerns, particularly in the area of reducing direct fire exposure. Third, the program will position the Army with the appropriate new technologies necessary to transition to the objective antitank system--the Common Module Missile.

There are three Key Performance Parameters (KPP) in the Operational Requirements Document (ORO).

- The first is to provide a completely autonomous missile upon firing, or a Fire and Forget primary mode.

- Second, it must have a wireless alternate mode for engagement when F&F is not possible. This includes close engagements, surprise engagements, engagements when the F&F is inoperative, engagements when the F&F coolant has been used up, and when conditions do not allow lock-on to the target with the primary mode, such as high humidity and high background clutter. The alternate mode also provides a capability for precision direct fire against secondary targets, such as bunkers. (This mode is also called the Command Line of Sight (CLOS) mode).

- Third, the missile must have a (classified) probability of kill given a shot (PkIs) against T90 PIP1 or equivalent type tank equipped with reactive armor and Active Protection Systems (APS) in the F&F and alternate modes out to a range of 4,000 meters. (Current maximum range of the TOW 28 missile is 3,750 meters.) The Counter APS capability (CAPS) should provide protection to defeat systems equal to that of Drozd or Arena systems with a (classified) degree protection angle.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- Antitank- TOW ITAS

**Reference** (Luedtke et al., 1997):

Luedtke, L. L., Jones, T., Downs, T., Reza, S. D. L., Meirose, J., & Modica, A. (1997). System Assessment (SA) for the Improved Target Acquisition System (ITAS): U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 93088152 / 1999-SER-1694A. DTIC ADB228834.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

140200 - Test Facilities, Equipment and Methods

171100 - Target Direction, Range and Position Finding

Descriptors:

(U) \*TARGET ACQUISITION, \*TARGET DETECTION, GUIDED MISSILES, DECISION MAKING, TRACKING, ACCURACY, OPERATIONAL EFFECTIVENESS, HUMAN FACTORS ENGINEERING, MAINTAINABILITY, RELIABILITY, MISSIONS, SYSTEMS ANALYSIS, VISION, RANGE FINDING, SYSTEM SAFETY, TUBE LAUNCHED

Identifiers:

(U) ITAS(IMPROVED TARGET ACQUISITION SYSTEM)

**System Description:**

ITAS is a significant upgrade to the current TOW2 antitank weapon system for light forces, providing major improvements in target acquisition and detection as well as in the FCS. The system is comprised of an integrated day/night sight which uses second generation forward looking infrared (FLIR) to extend the gunner's ability to detect and recognize targets, a LRF, automatic boresighting, aided target tracking (ATT) capability, an improved battery power supply (BPS), built-in-test and built-in-test equipment (BIT/BITE), and an embedded training (ET) capability. The ITAS will accommodate all currently fielded versions of the TOW antitank missile, and provides growth potential to accommodate a future longer-range missile system.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- Antitank- TOW ITAS

**Reference** (Mahana et al., 1998):

Mahana, J. C., Musser, D., Ottilige, D., Riemenschneider, J. R., Modica, A., & Laughman, R. (1998). System Assessment (SA) for the Improved Target Acquisition System (ITAS) Customer Test U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 93088152 / 1999-SER-1694A. DTIC ADB237267.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

170501 - Infrared Detection and Detectors

Descriptors:

(U) \*FORWARD LOOKING INFRARED SYSTEMS, \*TARGET ACQUISITION, \*INFRARED DETECTORS, TEST AND EVALUATION, MATERIALS, OPERATIONAL EFFECTIVENESS, RELEASE, SYSTEMS ANALYSIS

Identifiers:

(U) ITAS(IMPROVED TARGET ACQUISITION SYSTEM)

**System Description:**

**Equipment.** The ITAS is a significant upgrade to the current Tube-launched, Optically tracked, Wire-guided (TOW) antitank weapon system for light forces, providing major improvements in target acquisition and detection, as well as the Fire Control System (FCS). The system is comprised of an integrated day/night sight which uses second generation forward looking infrared (FLIR) to extend the gunner's ability to detect and recognize targets, a laser range finder (LRF), automatic boresight, Aided Target Tracker (ATT) capability, an improved Battery Power Supply (BPS), Built-in Test/Built-in Test Equipment (BIT/BITE), and an embedded training (ET) capability. The Field Tactical Trainer (FTT) is a training device that simulates the ITAS-TOW missile round during training. The ITAS will accommodate all currently fielded versions of the TOW antitank missile, and provides growth potential to accommodate a future longer-range missile system.

**Employment.** The ITAS is a materiel change to the existing TOW Weapon System and will interface with the existing TOW family of missiles, the TOW High Mobility Multi-purpose Wheeled Vehicle (HMMWV) platform, and will operate in a dismounted role. ITAS will be used by the light anti-armor platoons/companies throughout the continuum of unit operations.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- Antitank- TOW ITAS

**Reference** (Tull et al., 1999):

Tull, P., Modica, T., White, D., Luedtke, L., Derrick, G., & O'Looney, J. (1999). System Assessment (SA) for the Improved Target Acquisition System (ITAS): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report # 93088153.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

**System Description:**

The ITAS is a significant upgrade to the TOW 2 antitank weapon system for light and contingency forces, providing major improvements in target acquisition and detection as well as in fire control. There are four major subsystems: the fire control subsystem (FCS), the target acquisition subsystem (TAS), the traversing unit (TV), and the BPS. The launcher tube and the tripod are considered Government Furnished Equipment (GFE). System capabilities include an integrated day-night sight that uses second generation forward-looking infrared (FLIR) to extend the gunner's ability to detect and recognize targets, an eye-safe laser rangefinder (LRF), automatic boresighting, aided target tracking (ATT) capability, built-in test (BIT) and built-in test equipment (BITE), and an embedded training (ET) capability. The ITAS will accommodate all current versions of the TOW missile with growth potential to accommodate a potential future missile system.

**FTT Description.** The TOW ITAS (Field Tactical Trainer) FIT is the system's force-on-force trainer. The FIT uses Multiple Integrated Laser Engagement System (MILES) II technology. The FIT has a Training Missile Tube (TMT) similar to a TOW missile round. The soldier loads the TMT in the same manner as a TOW missile round, although there are two cables that must be attached to the ITAS system. In conjunction with the ET and the signature device, the FIT simulates the functioning of a TOW ITAS by providing simulated launch noises and visual simulations of launch effects, missile flight, and down range impact. The FIT will be operated, transported, and stored in the high mobility multi-purpose wheeled vehicle (HMMWV) without transit cases. It can be operated in the dismounted mode for a limited period of time. The FIT is compatible with MILES I, MILES II, and MILES 2000. However, using Basic MILES, the ITAS itself is not disabled in the event of a kill. The FIT will operate off of a battery tube when dismounted or on vehicle power.

**BPS Description.** The BPS provides electrical power to the ITAS when the HMMWV engine is off or when the ITAS dismounted. In the dismounted mode, it provides power for about 10 hours of operation. The BPS has three major sub-components: 1) BPS housing, 2) BPS control panel and software, and 3) BPS mono-block batteries (4 each). The mono-block batteries are 8-volt batteries. They normally operate in a range between 7.85 volts and 6.2 volts. The BPS software constantly monitors the individual voltages of each of the four mono-blocks, and charging actions are made based on these readings.

**BPS Controls.** The BPS software controls the PM reports as being in the new version of BPS software. The first three software checks are initiated during the charging process (either when HMMWV is turned on or when the BPS is plugged in). The last two software checks are executed while the BPS alone is providing power to the ITAS.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- Antitank- TOW ITAS

**Reference** (Tull et al., 1999):

Tull, P., Musser, D., Laughman, R., Modica, T., Meirose, J., White, D., Conners, M., & Richardson, P. (1999). System Evaluation Report (SER) for the Improved Target Acquisition System (ITAS): U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 93088152 / 1999-SER-1694A.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

**System Description:**

The ITAS is designed to be a significant upgrade to the TOW 2 antitank weapon system for light and contingency forces, providing major improvements in target acquisition and detection as well as in fire control. There are four major subsystems: the fire control subsystem (FCS), the target acquisition subsystem (TAS), the traversing unit (TV), and the battery power source (BPS). The missile launcher and the tripod are considered government-furnished equipment. System capabilities include an integrated day-night sight that uses second generation forward-looking infrared (FLIR) to extend the gunner's ability to detect and recognize targets, an eye-safe laser rangefinder (LRF), automatic boresighting, aided target tracking (ATT) capability, built-in test (BIT) and built-in test equipment (BITE), and an embedded training (ET) capability. The ITAS will accommodate all current versions of the TOW missile with growth potential to accommodate a potential future missile system.

The TOW ITAS FTT is the system's force-on-force trainer. The FTT uses Multiple Integrated Laser Engagement System (MILES) II technology. The FTT has a Training Missile Tube (TMT) similar to a TOW missile round. The soldier loads the TMT in the same manner as a TOW missile round, although there are two cables that must be attached to the ITAS system. In conjunction with the ET and the signature device, the FTT simulates the functioning of a TOW ITAS by providing simulated launch noises and visual simulations of launch effects, missile flight, and down range impact. The FTT is designed to be operated, transported, and stored in the high mobility multi-purpose wheeled vehicle (HMMWV) without transit cases. It can be operated in the dismounted mode for a limited period of time. The FTT operates on a battery tube when dismounted. The FTT is compatible with Multiple Integrated Laser Engagement System (MILES) I, MILES II, and MILES 2000. However, unless using Basic MILES, the ITAS itself is not disabled in the event of a kill. The FTT is designed to operate off of a battery tube or vehicle power.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- Antitank- TOW ITAS CD

**Reference** (Mahana et al., 1998):

Mahana, J. C., Musser, D. R., Laughman, R., White, D., Modica, T., Meirose, J., Conners, M., & Riemenschneider, J. (1998). System Assessment (SA) for the Improved Target Acquisition System (ITAS), Customer Demonstration (CD): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report # 82667066.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)  
From DTIC ADB237267:

Fields and Groups:

170501 - Infrared Detection and Detectors

Descriptors:

(U) \*FORWARD LOOKING INFRARED SYSTEMS, \*TARGET ACQUISITION, \*INFRARED  
DETECTORS, TEST AND EVALUATION, MATERIALS, OPERATIONAL EFFECTIVENESS, RELEASE,  
SYSTEMS ANALYSIS

Identifiers:

(U) ITAS(IMPROVED TARGET ACQUISITION SYSTEM)

**System Description:**

From DTIC ADB237267:

**Equipment.** The ITAS is a significant upgrade to the current Tube-launched, Optically tracked, Wire-guided (TOW) antitank weapon system for light forces, providing major improvements in target acquisition and detection, as well as the Fire Control System (FCS). The system is comprised of an integrated day/night sight which uses second generation forward looking infrared (FLIR) to extend the gunner's ability to detect and recognize targets, a laser range finder (LRF), automatic boresight, Aided Target Tracker (ATT) capability, an improved Battery Power Supply (BPS), Built-in Test/Built-in Test Equipment (BIT/BITE), and an embedded training (ET) capability. The Field Tactical Trainer (FTT) is a training device that simulates the ITAS-TOW missile round during training. The ITAS will accommodate all currently fielded versions of the TOW antitank missile, and provides growth potential to accommodate a future longer-range missile system.

**Employment.** The ITAS is a materiel change to the existing TOW Weapon System and will interface with the existing TOW family of missiles, the TOW High Mobility Multi-purpose Wheeled Vehicle (HMMWV) platform, and will operate in a dismounted role. ITAS will be used by the light anti-armor platoons/companies throughout the continuum of unit operations.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- TBM- ATACMS

**Reference (OPTEC, 1997):**

OPTEC. (1997). System Evaluation Report (SER) for the Army Tactical Missile System (ATACMS) Block 1a Missile (U): U.S. Army Test and Evaluation Command (ATEC) (Formerly U.S. Army Operational Test and Evaluation Command- OPTEC), ATTN: CSTE-EAC-CC, Park Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADC058002.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

160400 - Guided Missiles

Descriptors:

(U) \*GUIDED MISSILES, \*TACTICAL WEAPONS, TEST AND EVALUATION, MILITARY  
REQUIREMENTS, KILL PROBABILITIES, FIRING TESTS(ORDNANCE), DAMAGE ASSESSMENT,  
OPERATIONAL EFFECTIVENESS, LETHALITY, ARMY PLANNING, FRAGMENTS, ANTIPERSONNEL  
AMMUNITION

**System Description:**

From: Manpower and Personnel Integration (MANPRINT) Assessment for the Army Tactical Missile System (TACMS) Block 1A, 1997 (U):

The ATACMS is a quick response, ground launched, surface-to-surface, long-range, precision strike, all weather, day/night weapon system. The ATACMS Block IA can only be fired from a modified M270 multiple launch rocket system (MLRS) launcher, referred to as the improved positioning determination system (IPDS) interim launcher. The ATACMS Block IA will be fired, maintained, repaired, trained for, and supported in a manner similar to the Block I missile and under all battlefield conditions. The Block IA missile will have fewer M74 Anti-Personnel Anti-Materiel (APAM) grenades than ATACMS Block I, and the new Inertial Measurement Unit (IMU) will be aided by the Global Positioning System (GPS) to improve accuracy. The ATACMS Block IA carries and dispenses 310 grenades. The outside surface of the grenades is configured with flutes which cause the grenades to spin as they fall to the target area. The grenade is armed by this spinning action before a rate of 3201 revolutions per minute (rpms) is achieved but not before 2400 rpms is achieved. Detonation occurs on impact with the ground or target surface.

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- TBM- ATACMS Unitary M48

**Reference** (Bayer et al., 2005):

Bayer, C., Kreko, Z., Raleigh, D., Dobbs, S., Thompson, P., & Shandle, G. (2005). System Assessment (SA) for the Army Tactical Missile System (ATACMS) Block 1a Quick Reaction Unitary, M48: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB308494.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

160400 - Guided Missiles

190100 - Ammunition and Explosives

Descriptors:

(U) \*TEST AND EVALUATION, \*GUIDED MISSILES, \*QUICK REACTION, \*SURVIVABILITY, \*INSENSITIVE EXPLOSIVES, \*TECHNOLOGY ASSESSMENT,

Identifiers:

(U) \*ATACMS(ARMY TACTICAL MISSILE SYSTEM), M48 MISSILES, QRU(QUICK REACTION UNIT)

**System Description:**

The ATACMS Block IVA QRU Program uses the ATACMS Block 1A main missile assembly to carry the Navy WDU-23/B Stand Off Land Attack Munition/Harpoon high explosive warhead. The intent for the ATACMS QRU, M48 is for the missile to retain similar range and accuracy characteristics as the Block 1A. The quick reaction variant is an all-weather, day-and-night missile capable of firing up to 300 kilometers. The modifications to the ATACMS Block 1A missile include the addition of insulation around the warhead and an additional g-switch. The guidance, motor sections, performance, and operation of the ATACMS QRU, M48 remain the same as for the ATACMS Block 1A. No unique hardware modifications are required for the QRU capability with launch platforms. Also, there is no impact to the logistical and manpower and personnel integration staffing levels. The target set includes buildings, bridges, bunkers, and petroleum, oils, and lubricants (POL) storage sites. The ATACMS QRU has a smaller lethal area than the Block 1A, which will minimize collateral damage. The QRU will provide the Corps and Joint Task Force commanders with a unique deep-strike capability to attack high-payoff targets and point targets in areas of dense foliage, deep snow cover, and built-up urban or protected sites.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to

Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- TBM- ATACMS-BAT

**Reference (OPTEC, 1998):**

OPTEC. (1998). System Assessment (SA) for the Army Tactical Missile System (ATACMS) Block II/Brilliant Anti-Armor Submunition (BAT): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report # 03548346. Report Classified SECRET/NOFORN. Citation Unclassified.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

**System Description:**

The Army TACMS is a quick response, ground launched, surface-to-surface, long range, precision strike, all weather, day/night weapon system. The Army TACMS Block II is a semi-ballistic missile designed to effectively attack and defeat targets at ranges greater than 100 kilometers. The Army TACMS Block II missile carries and dispenses thirteen BAT submunitions. Each BAT submunition is a brilliant, self-guided, anti-armor submunition used to autonomously seek, identify, attack, and destroy second-echelon armored and motorized combat maneuver forces. The Army TACMS Block II missile is stored, transported and launched from an enclosure assembly/launch pod, visually similar to the Multiple Launch Rocket System (MLRS) rocket pod container, and a modified M270 MLRS launcher using existing targeting, management and command and control systems. The Army TACMS Block II missile consists of the missile airframe, dispenser configuration for the BAT submunitions, guidance section containing an inertial measurement unit, propulsion section and a control section. (From ARL-HRED MANPRINT Assessment- 2001)

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET/NOFORN. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Missile- TBM- ATACMS-BAT

**Reference (ATEC, 2002):**

ATEC. (2002). System Assessment (SA) for the Army Tactical Missile System (ATACMS) Block II/Brilliant Antiarmor (BAT): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report # 22188703. Report Classification: SECRET/NOFORN. Citation Unclassified.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

**System Description:**

The Army TACMS is a quick response, ground launched, surface-to-surface, long range, precision strike, all weather, day/night weapon system. The Army TACMS Block II is a semi-ballistic missile designed to effectively attack and defeat targets at ranges greater than 100 kilometers. The Army TACMS Block II missile carries and dispenses thirteen BAT submunitions. Each BAT submunition is a brilliant, self-guided, anti-armor submunition used to autonomously seek, identify, attack, and destroy second-echelon armored and motorized combat maneuver forces. The Army TACMS Block II missile is stored, transported and launched from an enclosure assembly/launch pod, visually similar to the Multiple Launch Rocket System (MLRS) rocket pod container, and a modified M270 MLRS launcher using existing targeting, management and command and control systems. The Army TACMS Block II missile consists

of the missile airframe, dispenser configuration for the BAT submunitions, guidance section containing an inertial measurement unit, propulsion section and a control section. (From ARL-HRED MANPRINT Assessment- 2001)

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Mortar- 60mm- Cartridge- FRPC XM769

**Reference** (Modica and Heatwole, 2001):

Modica, A., & Heatwole, C. (2001). System Evaluation Report (SER) for the XM769 60mm Full Range Practice Cartridge (FRPC): U.S. Army Evaluation Center (AEC), Aberdeen Proving Ground, MD. Report #: 11658498. DTIC ADB267492.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*ACCEPTANCE TESTS, \*TRAINING AMMUNITION, COMBAT EFFECTIVENESS, MORTAR AMMUNITION, JOINT TEST AND EVALUATION, MORTARS, CARTRIDGES, COMBAT SIMULATION

Identifiers:

(U) 60mm AMMUNITION, XM769 CARTRIDGES

**System Description:**

The XM769 Full-Range Practice Cartridge is a low-cost, fullrange practice round intended to provide realistic training at a reduced cost. The round is fired from the M224 Lightweight Company Mortar System. The XM769 is designed to be externally similar to the M720, 60mm High Explosive (HE) Cartridge, with the exception of the four aft vent plugs. The XM769 consists of an M775 Point Detonating Practice Fuze that simulates the M734AI Multi-Option Fuze for Mortars. A plastic ogive simulates the contour and the four function settings of the M734AI fuze used on service mortar rounds. Upon impact, the M775 fuze functions, producing a flash, bang, and/or smoke signature that provides audio and visual feedback to forward observers. The round currently uses four M235 increments as the propelling charge system which is set off by the M702 ignition cartridge. This configuration is the same as that used on the other 60mm mortar cartridges. The cartridges are packed 1 to a fiber container and then over-packed 16 to a wire bound box.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Mortar- 60mm- Cartridge- HE M720A1

**Reference** (Modica et al., 2005):

Modica, A., Pandullo, M., Stewart, J., Garcia, T., Dobbs, S., Irr, K., Robinson, J., & Kuwik, P. (2005). System Assessment (SA) for the for the Production Verification Test of the 60mm High Explosive Cartridges, M720A1 and M768: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 53468076. DTIC ADB313732.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER, System Assessment (SA)

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*HIGH EXPLOSIVES, \*CARTRIDGES, TEST AND EVALUATION, METALS, DECISION MAKING, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, MORTARS, ARMY EQUIPMENT, LIGHTWEIGHT, PACKAGING, COMPANY LEVEL ORGANIZATIONS

Identifiers:

(U) SA(SYSTEM ASSESSMENT), LWCMS(LIGHTWEIGHT COMPANY MORTAR SYSTEM), MATERIAL CHANGE PACKAGE, \*60mm HIGH EXPLOSIVE CARTRIDGES M720A1 AND M768, PVT(PRODUCTION VERIFICATION TEST), SUITABILITY

**System Description:**

**a. The 60mm M720A1 and M768 cartridges** are HE loaded, fragmentation rounds for use against enemy troops, light vehicles, light bunkers and similar targets. The cartridges are designed to be fired from the 60mm M224 LWCMS. The 60mm M224 mortar is a smooth bore, muzzle-loaded, high-angle non-line-of-sight, man-portable weapon used by infantry type companies for supporting fires to maneuver units. The M720A1 and M768 cartridges are IM-enhanced rounds that will replace the current 60mm M720 and M888 HE ammunition.

**b. The 60mm M720A1 HE cartridge** is comprised of a M734A1 multi-option (MO) fuze, a plastic fuze adapter, a high fragmentation (HF-1 steel) projectile body loaded with approximately 0.79 pound of explosive, a plastic obturating ring, four each - M235 propelling charge increments containing M38 ball propellant, a M702 ignition cartridge, and a M27 fin. The complete round is approximately 14.85 inches in length and weighs about 3.65 pounds. The 60mm M768 HE cartridge is identical to the 60mm M720A1 HE cartridge, except for the fuze. The M768 cartridge is assembled with a M783 point detonating/delay (pD/DLY) fuze. The M783 fuze is a modified version of the M734A1 multi-option fuze with a less complex, electronic firing circuit. Both fuzes have the same safe and arming (S&A) mechanism, turbine alternator, impact switch, and explosive components. Per user (U.S. Army) requirements, the M783 fuze also has the same settings/markings as the M734A1 fuze: "60/81 PRX," "120 PRX," "IMP," and "DLY." The "60/81 PRX" and "120 PRX" settings on the M783 fuze, however, are dummy proximity settings for training use/practice: M783 fuzes set on these positions/markings will only function on impact. The M720A1 and M768 HE cartridges are packaged and shipped in PA164 fiber containers; eight each fiber containers/rounds per PA124 metal container; and, two each metal containers per wirebound wood box.

**c. The 60mm M720A1 and M768 HE cartridges** are fired from the M224 mortar by loading (inserting) the round (fin-end first) into the muzzle of the barrel. Upon release, the cartridge slides down the mortar barrel and strikes the firing pin in the basecap (drop-fire mode). Impact with the firing pin initiates the percussion primer of the M702 ignition cartridge. The primer ignites the black powder pellet and M9 propellant in the ignition cartridge, which in turn ignites the M38 propellant in the M235 propelling charge increments. The combustion gas from the burning propellant expands the obturating ring and accelerates the explosive loaded projectile up the barrel. The projectile exits the muzzle and is stabilized in flight by the canted blades of the M27 fin. At the target, the M734A1 fuze functions/detonates the M720A1 cartridge in one of three pre-selected modes: proximity @7 feet height ofburst (when set on "60/81 PRX"), impact or delay. The M783 fuze functions the M768 cartridge upon impact (when set on "60/81 PRJC", "120 PRX" or "IMP") or delay. The mode of functioning is set by rotating the fuze head assembly (by hand) before firing. The proximity and impact modes are electrical and detonate the fuze through the electric detonator in the safe and arming device. The delay mode is mechanical and is always available after arming, thereby serving as a backup for all electrical functions. The state of the art electronic assembly includes signal processing which allows the fuze to monitor apogee and delays final fuze (electronic) arming until after apogee, thus eliminating the upleg early problem exhibited by the older M734 fuze. The maximum range of the cartridges is approximately 3,500 meters (under standard conditions).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to

Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458:

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**System Short Name:** SER- Mortar- 60mm- Cartridge- IRILL M767

**Reference** (Modica et al., 2000):

Modica, A., Heatwole, C., Abeyta, R., & Bullett, M. (2000). System Assessment (SA) for the 60mm Infrared Illumination Cartridge, M767: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB261493.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

190101 - Pyrotechnics

**Descriptors:**

(U) \*ILLUMINATION, \*CARTRIDGES, ACCEPTANCE TESTS, REQUIREMENTS, TEST METHODS, SYSTEMS ANALYSIS

**Identifiers:**

(U) PQT(PRODUCTION QUALIFICATION TEST), FAT(FIRST ARTICLE TEST), LAT(LOT ACCEPTANCE TEST), CAP(CORRECTIVE ACTION PLAN), PVT(PRODUCT VERIFICATION TEST), LWCMS(LIGHTWEIGHT COMPANY MORTAR SYSTEM)

**System Description:**

The original M721 cartridge is part of the full family of ammunition for the M224, 60mm Lightweight Company Mortar System (LWCMS). The cartridge is intended for use by the Airborne, Air Assault, Light Infantry, and Ranger Rifle Companies of the U.S. Army and U.S. Marine Corps. The M721 uses a standard illuminant candle to produce visible illumination. Except for the composition of the candle illuminant (Black-Nite formulation), the M767 uses the same components as the M721. The M767 is designed to provide IR illumination compatible with currently fielded passive night vision equipment (PNVE) which will increase the capability of the soldier to negotiate terrain and to effectively acquire and engage enemy targets at night. It provides illumination to observe the terminal effects of high explosive (HE) rounds at all ranges. The M767 consists of the M776 Mechanical Time Super-Quick (MTSQ) fuze, an illuminant mixture in a thin steel case with a swivel assembly, a prepackaged parachute assembly located in the tail cone section, the M702 ignition cartridge, four M204/M235 propellant increments, and the M27 fin assembly. The five degree canted fins maintain round stability. The approximate weight and length of the complete round are 3.75 pounds and 16.8 inches, respectively.

When the M767 is dropped down the mortar tube, the primer strikes the firing pin located at the bottom of the tube, initiating the ignition cartridge. The ignition cartridge then ignites the propellant increments, resulting in the formation of combustion gases. The gases propel the round out of the mortar tube towards the target area. At a preset time, the fuze functions, igniting the expulsion charge and then igniting and ejecting the candle assembly. A spring ejects the parachute from the tail cone. The parachute then opens, slowing the descent of the illuminating candle.

The M776 MTSQ fuze can be set to function at times ranging from 6 to 54 seconds. The M767 candle is designed to provide minimal visible light, while providing IR radiant energy for a minimum of 40 seconds, with an objective of 50 seconds. The M767 is required to provide illumination out to the full range, 3,489 meters, of the M720 60mm HE cartridge.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Mortar- 60mm- Cartridge- IRILL XM767

**Reference** (Modica et al., 1999):

Modica, A., Heatwole, C., Abeyta, R., Luedtke, L., & Russell, G. (1999). System Evaluation Report (SER) for the 60mm Infrared Illuminating (IR- ILL) Cartridge, XM767: U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 92728139. DTIC ADB247593.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*ACCEPTANCE TESTS, \*CARTRIDGES, ILLUMINATION, SMALL ARMS, SYSTEMS ANALYSIS, INFRARED RADIATION, HIGH EXPLOSIVE AMMUNITION

Identifiers:

(U) \*INFRARED ILLUMINATING CARTRIDGES, XM767 CARTRIDGES, 60mm CARTRIDGES, PQT(PRODUCTION QUALIFICATION TEST)

**System Description:**

The original M721 Cartridge is part of the full family of ammunition for the M224, 60mm Lightweight Company Mortar System, The cartridge is intended for use by the Airborne, Air Assault, Light Infantry, and Ranger Rifle Companies of the US Army and US Marine Corps. The M721 uses a standard illuminant candle to produce visible illumination. Except for the composition of the candle illuminant (Black-Nite formulation), the XM767 uses the same components as the M721. The XM767 is designed to provide IR illumination compatible with currently fielded passive night vision equipment which will increase the capability of the soldier to negotiate terrain and to effectively acquire and engage enemy targets at night. It provides illumination to observe the terminal effects of the high explosive (HE) rounds at all ranges. The XM767 consists of the M776 Mechanical Time SuperQuick (MTSQ) fuze, an illuminant mixture in a thin steel case with a swivel assembly, a prepackaged parachute assembly located in the tailcone section, the M702 ignition cartridge, four M235 propellant increments, and the M27 fin assembly. Round stability is maintained by the five-degree canted fins. The approximate weight and length of the complete round are 3.75 pounds and 16.8 inches, respectively.

When the XM767 is dropped down the mortar tube, the primer strikes the firing pin located at the bottom of the tube, initiating the ignition cartridge. The ignition cartridge then ignites the propellant increments, resulting in the formation of combustion gases. The gases propel the round out of the mortar tube towards the target area. At a preset time, the fuze functions, igniting the expulsion charge and ejecting and igniting the candle assembly. A spring ejects the parachute from the tailcone. The parachute then opens, slowing and stabilizing the descent of the illuminating candle.

The M776 MTSQ fuze can be set to function at times ranging from 6 to 54 seconds. The XM767 candle is designed to provide minimal visible light, while providing IR radiant energy for a minimum of 40 seconds, with an objective of 50 seconds. The XM767 is required to provide illumination out to the full range of the M720 60mm HE Cartridge.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Mortar- 60mm- Cartridge- MAPAM XM1061

**Reference** (Juba et al., 2006):

Juba, J., Modica, A., Dobbs, S., Robinson, J., Anaya, A., & Hacker, K. (2006). System Evaluation Report (SER) for the 60mm Mortar Anti-Personnel Anti-Materiel Production Qualification Test (Mapam): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 63569217. DTIC ADB324169

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*HIGH EXPLOSIVES, \*ANTIPERSONNEL AMMUNITION, \*CARTRIDGES, \*ANTIMATERIEL AMMUNITION, TEST AND EVALUATION, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, MORTARS, PROPELLANTS, ARMY EQUIPMENT, MORTAR AMMUNITION

Identifiers:

(U) \*MORTAR ANTI-PERSONNEL ANTI-MATERIEL, \*60mm LIGHTWEIGHT COMPANY MORTAR SYSTEM, SYSTEM EVALUATION REPORT, MAPAM(MORTAR ANTI-PERSONNEL ANTI-MATERIEL), TC-STD(TYPE CLASSIFICATION-STANDARD), PQT(PRODUCTION QUALIFICATION TEST), M720 CARTRIDGE, SUITABILITY

#### **System Description:**

The 60mm MAPAM is a High Explosive (HE) fragmentation round which will replace or augment the M720 cartridge. Both cartridges are designed for use with the M224 60mm Lightweight Company Mortar System. The MAPAM differs from the conventional cast-steel projectile shell (loaded with HE) because of its fragmentation principle of steel balls in an epoxy matrix. The fragmentation principle is one where a functioning MAPAM cartridge will result in a uniform fragment mass (0.3 gram) and a narrow fragment velocity band of 1,000 to 1,200 meters per second. The PBXN- 110 explosive will replace the Composition B explosive used in the M720. The MAPAM configuration consists of:

- a. The XM 1046 with the M783 point detonating (PD)/delay fuze or the XM 1061 with the M734A 1 multioption fuze for mortars.
- b. Four XM236 nitrocellulose propellant increments loaded with the M38 extruded impregnated propellant.

#### **Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Mortar- 60mm- Cartridge- SRTR M766

#### **Reference** (Modica et al., 1998):

Modica, A., Abeyta, R., Heatwole, C., & Campbell, J. (1998). System Assessment (SA) for the Production Verification Test of the 60mm Short Range Training Round (Srtr): U.S. Army Evaluation Analysis Center., Aberdeen Proving Ground, MD 21005-3013. DTIC ADB233298.

#### **Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*TRAINING AMMUNITION, \*CARTRIDGES,

Identifiers:

(U) \*M766 AMMUNITION, \*LITR(LOW COST INDIRECT FIRE TRAINING ROUND), M224 MORTAR, REUSEABLE, PRODUCTION VERIFICATION, PRODUCTION TESTS

#### **System Description:**

The M766 cartridge is an LITR that is designed to be fired, recovered, and refurbished as a training round until it has been determined that the cartridge body is no longer serviceable. The round is fired from the M224 mortar using standard mortar sighting and fire control equipment.

The steel cartridge body is hollow and has been machined to accept the M779 point detonating fuze, the tail tin, three increment plugs, the obturator band, and three dud plugs. The M779 fuze contains a pyrotechnic spotting charge that produces a flash, bang, and smoke when functioned upon impact. The fuze comes with a windshield that simulates the shape and four settings (proximity, near-surface burst,

impact, and delay) of the M734 multi-option fuze. The fuze also has a packing clip that must be removed prior to firing. The tail fin assembly contains an ignition cartridge and a breech plug assembly. The ignition cartridge contains a primed 20-gauge shotgun shell casing loaded with double-base propellant that serves as the propelling charge system. The increment plugs are fitted into holes drilled at the base end of the projectile body. Their purpose is to simulate propellant charge increments, with no plugs the equivalent of Charge 0 up to three plugs equivalent to Charge 3. The obturator band is designed to prevent gases from escaping from around the cartridge body when the round is fired. After Pre-Production Qualification Testing (PPQT) of the XM840, the previous designation of the M766, a redesign of the cartridge was initiated, involving the incorporation of dud plugs into the cartridge body. The purpose of the dud plugs is to reduce the time and effort required for the recovery of the round, as well as to clearly indicate to the soldier the status of the fired projectile. Three dud plugs are located in the aft section of the projectile body, 120 degrees apart from each other. Upon recovery, if two or more dud plugs remain in the cartridge body, the round is considered a dud and operations shall be conducted to render the round safe. If one or no dud plugs remain in the cartridge body, then an acceptable fuze function has occurred and no operation needs to be performed to make round safe. The refurbishment kit consists of an M779 point detonating fuze, an ignition cartridge, an obturator ring, three increment plugs, three dud plugs, and a breech plug assembly.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution authorized to U.S. Gov't. agencies only; Critical Technology; Feb 98. Other requests shall be referred to Product Manager for Mortars, U.S. Army Armament Research, Development and Engineering Center, Attn: AMSTA-DSA-MO, Picatinny Arsenal, NJ 07806-5000. :

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**System Short Name:** SER- Mortar- 60mm- Cartridge- WP M722A1

**Reference** (Modica et al., 2003):

Modica, A., Johnson, K., Fendick, K., Meyer, W., Robinson, J., & Anaya, A. (2003). System Assessment (SA) for the 60mm M722A1 White Phosphorus (WP) Mortar Cartridge: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB295475.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

190600 - Guns

Descriptors:

(U) \*MORTAR AMMUNITION, TEST AND EVALUATION, REQUIREMENTS, DECISION MAKING, LIGHTWEIGHT, COMPANY LEVEL ORGANIZATIONS, SYSTEMS ANALYSIS, MORTARS, POINT DETONATING FUZES, WHITE PHOSPHORUS, TIME DELAY FUZES

Identifiers:

(U) 60mm AMMUNITION, M-722 MORTAR AMMUNITION

**System Description:**

The M722A1 Cartridge is a bulk-filled, WP round primarily intended to be used as a marker. The M722A1 consists of a projectile body, M27 fin assembly, four M204 propellant increments, the M702 ignition cartridge, and an obturating ring. The M722A1 is the same as the M722 WP Cartridge, but with a new fuze. The M722A1 contains the M783 PD/DLY fuze in place of the M745 PD fuze.

The 60mm M722A1 Cartridge is designed to fire from the 60mm M224 Mortar. When the cartridge is dropped into the mortar tube, it slides down and contacts the firing pin at the base of the tube; this initiates the primer. The primer flash ignites the ignition cartridge, which in turn ignites the propellant charge. Rapidly expanding gases from the burning propellant expand the obturating ring, propelling the cartridge into flight. Stabilization in flight is accomplished by aerodynamic and slight spin action from the canted fin blades. The M783 PD/DLY fuze is set on impact and is armed by setback forces and air ingestion (dual safety). Upon impact, the fuze functions and detonates the burster charge; this partially ruptures the projectile and immediately disperses most of the WP filler. The WP ignites on contact with air, producing a dense white smoke. The remaining WP reacts more slowly, maintaining a trail back to the

point of impact. The maximum range of the cartridge is approximately 3500 meters (under standard conditions).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Mortar- 60mm- Fuze- PD/DLY M720E1

**Reference** (Modica and Heatwole, 2001):

Modica, A., & Heatwole, C. (2001). System Evaluation Report (SER) for the M720E1 and XM768 60mm Insensitive Munition Cartridges and XM783 Point Detonating/Delay Fuze (PDDL) Production Qualification Test: U.S. Army Evaluation Center (AEC), Aberdeen Proving Ground, MD. Report #: 12638561. DTIC ADB270448.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*FUZES(ORDNANCE), \*CARTRIDGES, \*HIGH EXPLOSIVE AMMUNITION, TEST AND EVALUATION, SURVIVABILITY, DELAY, SYSTEMS ANALYSIS, ORDNANCE, DETONATORS

Identifiers:

(U) 60mm CARTRIDGES, M720E1 CARTRIDGES, XM768 CARTRIDGES, XM783 FUZES

**System Description:**

The M720E1 cartridge is an HE fragmentation round for use against troops, light vehicles, light bunkers, and similar targets. The M720E1 configuration tested in the PQT consists of the M734 Multi-Option Fuze; a threaded, plastic fuze adapter; a steel projectile loaded with explosive; M27 Fin; M235 Propelling Charge consisting of four combustible increment containers loaded with M38 ball propellant; M702 Ignition Cartridge; and an obturating ring. Although not available for the PQT, the final configuration of the M720E1 will be fuzed with the M734AI Multi-Option Fuze for Mortars (MOFM). The projectile body is made of high fragmentation (HF)-1 steel and is threaded at the nose to accept the fuze adapter and at the base to accept the fin assembly. The body is filled with approximately 0.79 pound of a new melt-castable, PAX-21 (a.k.a. CBR-12E) 1M explosive. The weight of the complete round is 3.75 pounds; its length is 14.84 inches.

The M734 fuze is capable of functioning in four different modes: Proximity (PRX), Near Surface Burst (NSB), Impact (IMP), and DLY. Rotating the fuze head assembly (by hand) sets the mode of functioning before firing. The PRX, NSB, and IMP modes are electrical and detonate the fuze through the electric detonator in the safe and arming (S&A) device. The DLY mode is mechanical and is always available after arming, thereby serving as a backup for all electrical functions. The M734 fuze was loaded with the PBXN-5 booster that will also be used with the M734A1. The M734 used in the PQT and the M734A1 fuzes have the same S&A mechanism design, lead charge, detonator, and booster explosive (PBXN-5). The difference between the two fuzes is in the electronics. The modern electronic assembly in the M734AI includes signal processing which allows the fuze to monitor apogee and delay fuze electronic arming until after apogee, thus eliminating upleg earlies. The XM768 cartridge has the same design as the M720E1 cartridge, except for the fuze.

The XM768 cartridge is assembled with an XM783 PD/DLY fuze. Both cartridges are designed for firing from the 60mm M224 Mortar. The cartridge is loaded into the muzzle of the mortar barrel and released. The cartridge slides down the mortar barrel and strikes the firing pin at the bottom (in the basecap). The firing pin initiates the percussion primer of the ignition cartridge. The primer ignites the black powder pellet and M9 propellant in the ignition cartridge. The ignition cartridge in turn ignites the propellant increments. The combustion gases from the burning propellant expands the obturating ring, accelerates the round up the barrel, and propels it towards the target area. Stabilization in flight is accomplished by aerodynamic

and spin action from the canted fin blades. The maximum range of the M720E1 and XM768 cartridges is approximately 3,500 meters.

The XM783 PD/DLY fuze is capable of functioning in two different modes: IMP (point detonating) and DLY. Rotating the fuze head (by hand) before firing sets the mode of functioning. Presently, the XM783 fuze has the same settings/markings as the M734A1 MOFM: "60/81 PRX," "120 PRX," "IMP," and "DLY." The two proximity settings, "60/81 PRX" and "120 PRX", are "dummy" settings: fuzes set on these markings will function on impact. The XM783 and M734 fuzes have the same S&A mechanism design, lead charge, and booster explosive. The XM783 will be compatible with the XM768 60mm HE, M722E1 60mm White Phosphorus (WP), M889A1E1 81mm HE, and the M933E1 120mm HE ammunition.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Mortar- 81mm- Cartridge- HEMC M889A1E1

**Reference** (Wallace et al., 2007):

Wallace, P., Modica, A., Dobbs, S., Robinson, J., & Garcia, T. (2007). System Evaluation Report (SER) for the Type Classification Decision for the Mortar, 81mm, High Explosive Mortar Cartridge (HEMC), M889A1E1: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 70659234. DTIC ADB324876.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*HIGH EXPLOSIVES, \*CARTRIDGES, FUZES(ORDNANCE), DELAY ELEMENTS(EXPLOSIVE), MORTARS, FRAGMENTATION AMMUNITION

**System Description:**

The 81mm M889A1E1 is a HE fragmentation round that will replace the M889A1 cartridge. Both cartridges are designed for use with the M252 81mm Mortar System. The major components of the M889A1 cartridge include the M935 Point Detonating (PD) Fuze, M24 Fin Assembly, M220 Propelling Charge, M299 Ignition Cartridge, Obturating Ring, and a Composition B explosive fill. The M889A1E1 configuration will replace the M935 PD Fuze with the M783 PD/Delay Fuze.

The M889A1E1 is assembled with the M783 PD/Delay Fuze, which is air-powered with two function modes. The fuze functioning mode is set manually by rotating the fuze ogive (head assembly). The M783 fuze has the same settings and markings as the M734A1 Multi-option Fuze for Mortars, i.e., "60/81 proximity (PRX)," "120 PRX," "impact (IMP)," and "delay (DLY)." The two PRX settings, "60/81 PRX" and "120 PRX," are training settings. Fuzes set on these markings will function "IMP." The DLY mode will cause the fuze to function approximately 50 to 150 milliseconds after projectile impact. The M783 is a modified M734A1 fuze where a simple electronic firing circuit replaces the more complex M734A1 electronic circuitry.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Mortar- 81mm- Cartridge- IRILL XM816

**Reference** (Modica and Heatwole, 2001):

Modica, A., & Heatwole, C. (2001). System Evaluation Report (SER) for the XM816 81mm Infrared Illumination Cartridge. Corrective Action Plan: U.S. Army Evaluation Center (AEC), Aberdeen Proving Ground, MD. Report #: 11878523. DTIC ADB268221.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*CARTRIDGES, \*ILLUMINATING PROJECTILES, TEST AND EVALUATION, PRODUCTION, VERIFICATION, ARMY FACILITIES, ARMY EQUIPMENT, AMMUNITION, RELEASE, SYSTEMS ANALYSIS, INFRARED EQUIPMENT

Identifiers:

(U) M-816 CARTRIDGES, 81-MM AMMUNITION

**System Description:**

The 81mm XM816 IR Illuminating Cartridge was designed to provide IR illumination compatible with currently fielded passive night vision equipment (PNYE). The XM816 will increase the capability of the soldier to negotiate terrain and to effectively acquire and engage enemy targets at night. It provides illumination to observe the terminal effects of the 81mm high explosive (HE) rounds at all ranges. The XM816 was designed as a Materiel Change to the 81mm M853AI Standard Illuminating Cartridge and will therefore be operated in the same configuration as its predecessor. The IR candle is the only component of the XM816 that is different from the M853A1 and was designed to burn for a minimum of 60 seconds. The XM816 is equipped with the M772 Mechanical Time/Superquick (MTSQ) fuze that can be preset to function between 4 and 55 seconds after firing. The fuze contains a safety wire and can be preset using the wrench provided. The XM816 also consists of the M29 fin assembly, four incremental M219 propellant charges, the M752AI ignition cartridge, and an obturating ring that is intended to prevent ignition gases from leaking past the round as it travels out the tube. The XM816 is designed with the parachute assembly prepackaged and located in the body tube section. The body contains the illuminant assembly stored in a steel case with swivel assembly. The weight of the complete round is 8.9 pounds and the length is 25.4 inches.

When the XM816 is dropped down the mortar tube, the primer strikes the firing pin located at the bottom of the tube, initiating the ignition cartridge. The ignition cartridge then ignites the propellant increments, resulting in the formation of combustion gases. The gases propel the round out of the mortar tube towards the target area. The round is stabilized in flight by its aerodynamic shape and seven-degree canted fins. At a preset time, the fuze functions, igniting the expulsion charge and ejecting and igniting the candle assembly. The parachute then opens, slowing the descent of the illuminating candle.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Mortar- 81mm- Cartridge- IRILL XM816

**Reference** (Modica et al., 2002):

Modica, A., Heatwole, C., Teletski, L., Bullet, M., & Bracamonte, L. (2002). System Assessment (SA) for the M816 81mm Infrared Illumination Cartridge: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. APG, MD. DTIC ADB276203.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

190101 - Pyrotechnics

Descriptors:

(U) \*ILLUMINATING PROJECTILES, ACCEPTANCE TESTS, ARMY EQUIPMENT, SYSTEMS ANALYSIS, CARTRIDGES, INFRARED FUZES

Identifiers:

(U) 81-MM INFRARED ILLUMINATION CARTRIDGE, M-816 ILLUMINATING CARTRIDGES

**System Description:**

The 81mm M816 IR Illuminating Cartridge was designed to provide IR illumination compatible with currently fielded passive night vision equipment (PNVE). The M816 will increase the capability of the soldier to negotiate terrain and to effectively acquire and engage enemy targets at night. It provides illumination to observe the terminal effects of the 81mm high explosive (HE) rounds at all ranges. The M816 was designed as a Materiel Change to the 81mm M853A1 Standard Illuminating Cartridge and will therefore be operated in the same configuration as its predecessor. The IR candle is the only component of the M816 that is different from the M853A1 and was designed to burn for a minimum of 60 seconds. The M816 is equipped with the M772 Mechanical Time/Superquick (MTSQ) fuze that can be preset to function between 4 and 55 seconds after firing. The fuze contains a safety wire and can be preset using the wrench provided. The M816 also consists of the M29 fin assembly, four incremental M219 propellant charges, the M752A1 ignition cartridge, and an obturating ring that is intended to prevent ignition gases from leaking past the round as it travels out the tube. The M816 is designed with the parachute assembly prepackaged and located in the bodytube section. The body contains the illuminant assembly stored in a steel case with swivel assembly. The weight of the complete round is 8.9 pounds and the length is 25.4 inches.

When the M816 is dropped down the mortar tube, the primer strikes the firing pin located at the bottom of the tube, initiating the ignition cartridge. The ignition cartridge then ignites the propellant increments, resulting in the formation of combustion gases. The gases propel the round out of the mortar tube towards the target area. The round is stabilized in flight by its aerodynamic shape and seven-degree canted fins. At a preset time, the fuze functions, igniting the expulsion charge and ejecting and igniting the candle assembly. The parachute then opens, slowing the descent of the illuminating candle.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Mortar- 120mm- Cartridge- FRPC M931

**Reference** (Modica et al., 1998):

Modica, A., Abeyta, R., Heatwole, C., & Luedtke, L. (1998). System Assessment (SA) for the 120mm M931 Full Range Practice Cartridge (FRPC): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. USAEAC, APG, MD. DTIC ADB240775.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*CARTRIDGES, TEST AND EVALUATION, ACCEPTANCE TESTS, DECISION MAKING, PRODUCTION, RELEASE, SYSTEMS ANALYSIS

Identifiers:

(U) 120-MM AMMUNITION, M-931 CARTRIDGES

**System Description:**

The M931 is fitted with the M781 fuze (a hybrid of the M775 and M751 mortar practice fuzes) that simulates the M734AI Multi-Option Fuze for Mortars. It has the same settings, but they are not

operational. The fuze functions only upon impact. The M781 spotting charge releases a flash, bang, and smoke signature upon ground impact providing audio and visual feedback to forward observers. The round also consists of a low-cost shell body, the Reverse Engineered M34 fin assembly, the M981 ignition cartridge (MI005), an obturating band, and a final propellant charge configuration resulting from the Residue Reduction Program. This cartridge is the first to use the Residue Reduction Program propellant. The M931 is designed to be externally similar to the current family of enhanced ammunition for the 120mm Mortar System, to include the M934 and M933 High Explosive (HE) Cartridges, the M929 White Phosphorus Cartridge, and the XM930 Illumination Cartridge.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Mortar- 120mm- Cartridge- ILL IR XM983

**Reference** (Modica et al., 2000):

Modica, A., Heatwole, C., Abeyta, R., & Russell, G. (2000). System Evaluation Report (SER) for the 120mm Infrared Illuminating Cartridge, XM983: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 01158249. DTIC ADB253150.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*MORTARS, \*CARTRIDGES, TEST AND EVALUATION, ARMY EQUIPMENT, CLASSIFICATION, SYSTEMS ANALYSIS

Identifiers:

(U) EXPORT CONTROL, M-983 AMMUNITION, 120-MM MORTARS

**System Description:**

The XM983 is being developed as a Materiel Change (MC) to the XM930 Visible Illumination Cartridge. The MC consists of changing the candle illuminant to a chemical mixture that will illuminate in near-IR wavelengths of the electromagnetic spectrum. The XM983 candle will be designed to provide minimal candlepowers of visible light, while providing IR radiant energy for a minimum of 50 seconds of effective burntime. The XM983 will have the same ballistic characteristics as the XM930, including a maximum range capability of 7,000 meters. The XM983 will be assembled with the M776 Mechanical Time Super Quick Fuze, which can be set to function in from 6 to 54 seconds.

The XM983 will also use the M230 Propellant Charge System with standard Increment Protectors, M31 Fin Assembly, and M981 Ignition Cartridge. The XM983 is 70.3 centimeters (27.7 inches) long and weighs 13.6 kilograms (30 pounds). The XM983 will be fired from the M120 Towed Mortar or the M121 Carrier Mortar. These 120mm Battalion Mortars are muzzle-loaded, smooth bore tubes configured with the M298 Cannon Assembly, M191 Bipod Assembly, and the M9 Baseplate.

When the XM983 is dropped down the mortar tube, a firing pin located on the bottom of the tube initiates the ignition cartridge. The ignition cartridge then ignites the propellant increments resulting in the formation of combustion gases. The gases propel the round out of the mortar tube toward the target area. At a preset time, the M776 fuze functions, ejecting the candle assembly and parachute from the tail cone. The parachute then opens, slowing the descent of the illuminating candle.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to

Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458:

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**System Short Name:** SER- Mortar- 120mm- Cartridge- ILL XM930

**Reference** (Modica et al., 2000):

Modica, A., Heatwole, C., Abeyta, R., & Bracamonte, L. (2000). System Evaluation Report (SER) for the 120mm Illuminating Cartridge, XM930: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 03088325. DTIC ADB256697.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*ILLUMINATION, \*CARTRIDGES, TEST AND EVALUATION, REQUIREMENTS, OPTIMIZATION, PRODUCTION, ARMY EQUIPMENT, CLASSIFICATION, SYSTEMS ANALYSIS, LOW RATE

Identifiers:

(U) 120-MM CARTRIDGES

**System Description:**

The XM930 will be fired from the M120 Towed Mortar or the M121 Carrier Mortar. These 120mm Battalion Mortars are muzzle loaded, smooth bore tubes configured with the M298 Cannon Assembly, M191 Bipod Assembly, and M9 Baseplate.

The XM930 illuminates in the visible region of the electromagnetic spectrum from 0.4 to 0.7 micrometers (10\*\*6). One XM930 round is required to produce at least 1 million candlepower of light intensity for at least 50 seconds. The cartridge is designed to have the same external physical characteristics as the other 900 series 120mm cartridges. The XM930 will be assembled with the M776 Mechanical Time Super Quick Fuze, which can be set to function from 6 to 54 seconds. The XM930 will also utilize the M31 fin assembly, M981 ignition cartridge, and four horseshoe-shaped M230 propellant increments. The XM930 is 27.8 inches long and weighs 31.2 pounds.

When the XM930 is dropped down the mortar tube, a firing pin located on the bottom of the tube initiates the ignition cartridge. The ignition cartridge then ignites the propellant increments resulting in the formation of combustion gases. The gases propel the round out of the mortar tube toward the target area. At a preset time, the M776 fuze functions, ejecting the candle assembly and parachute from the tail cone. The parachute then opens, slowing the descent of the illuminating candle.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Mortar- 120mm- Cartridge- IRILL M983

**Reference** (Modica et al., 2003):

Modica, A., Johnson, I., Heatwole, C., Teletski, L., Houghton, G., & Bullett, M. (2003). System Assessment (SA) for the 120mm M983 Infrared Illumination (IRILL) Mortar Cartridge, Production Verification Test U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB291194.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

190100 - Ammunition and Explosives

**Descriptors:**

(U) \*MORTAR AMMUNITION, TEST AND EVALUATION, DECISION MAKING, SYSTEMS ANALYSIS, INFRARED EQUIPMENT, CARTRIDGES

**Identifiers:**

(U) M-983 AMMUNITION, 120-MM MORTARS

**System Description:**

The M983 is being developed as an MC to the M930 Visible Illumination Cartridge. The MC consists of changing the candle illuminant to a chemical mixture that will illuminate in near-IR wavelengths of the electromagnetic spectrum. The M983 candle will be designed to provide minimal candlepower of visible light, while providing IR radiant energy for a minimum of 50 seconds of effective burntime. The M983 will have the same ballistic characteristics as the M930, including a maximum range capability of 7000 meters. The M983 will be assembled with the M776 Mechanical Time Super Quick Fuze, which can be set to function in from 6 to 54 seconds. The M983 will also use the M230 Propellant Charge System with standard increments, and the M31 Fin Assembly and M981 Ignition Cartridge. The M983 is 70.3 centimeters (27.7 inches) long and weighs 13.6 kilograms (30 pounds).

The M983 will be fired from the M120 Towed Mortar or the M121 Carrier Mortar. These 120mm Battalion Mortars are muzzle-loaded, smooth bore tubes configured with the M298 Cannon Assembly, M191 Bipod Assembly, and the M9 Baseplate.

When the M983 is dropped down the mortar tube, a firing pin located on the bottom of the tube initiates the ignition cartridge. The ignition cartridge then ignites the propellant increments resulting in the formation of combustion gases. The gases propel the round out of the mortar tube toward the target area. At a preset time, the M776 fuze functions, ejecting the candle assembly and parachute from the tail cone. The parachute then opens, slowing the descent of the illuminating candle.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Mortar- 120mm- Cartridge- M933E1

**Reference** (Wallace et al., 2007):

Wallace, P., Modica, A., Dobbs, S., Taylor, B., & Irr, K. (2007). System Evaluation Report (SER) for the the Type Classification Decision for the Mortar, 120mm, High Explosive Cartridge, M933E1: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

**Fields and Groups:**

190100 - Ammunition and Explosives

**Descriptors:**

(U) \*HIGH EXPLOSIVES, \*MORTARS, \*CARTRIDGES, TEST AND EVALUATION, REQUIREMENTS, OPERATIONAL EFFECTIVENESS, FRAGMENTATION AMMUNITION

**System Description:**

The 120mm M933E1 is a HE fragmentation round that will replace the M933 cartridge. The M933E1 will use the same configuration as the M934A1 120mm HE cartridge with the exception of the M734A1 Multi-Option Fuze being replaced with the M783 Point Detonating/Delay (PD/DLY) Fuze. The major components of the M933E1 cartridge include the M783 PD/DLY Fuze, M31 Fin Assembly, M1020 Ignition Cartridge, M234 Propelling Charge, Obturating Ring, and a Composition B explosive fill. Both cartridges are designed for use with the M120/M121 120mm Battalion Mortar System, the Stryker Mortar Carrier, and Future Combat System Non Line of Sight Mortar.

The M933E1 is assembled with the M783 PD/DLY Fuze, which is air-powered with two function modes. The fuze functioning mode is set manually by rotating the fuze ogive (head assembly). The M783 fuze has the same settings and markings as the M734A 1 Multi-Option Fuze for Mortars, i.e., "60/81 proximity (PRX)," "120 PRX, .... impact (IMP)," and "delay (DLY)." The two proximity settings, "60/81 PRX" and "120 PRX," are training settings and fuzes set on these markings will function "IMP." The DLY mode will cause the fuze to function approximately 50 to 150 milliseconds after projectile impact. The M783 is a modified M734A1 fuze where a simple electronic firing circuit replaces the more complex M734A1 electronic circuitry.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Mortar- 120mm- Cartridge- M934A1

**Reference** (Modica et al., 2001):

Modica, A., Heatwole, C., Abeyta, R., Teletski, L., & Irr, K. (2001). System Assessment (SA) for the Production Verification Test of the 120mm M934A1 High Explosive Cartridge: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. AEC, APG, MD. DTIC ADB269316.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:  
190100 - Ammunition and Explosives  
Descriptors:  
(U) \*HIGH EXPLOSIVES, TEST AND EVALUATION, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, MORTARS, CARTRIDGES  
Identifiers:  
(U) M-934A1

**System Description:**

The M934 HE, M933 HE, XM930 Illumination, and M929 Smoke Cartridges make up the current enhanced family of ammunition for the BMS-120. All of the cartridges have the same external shape, nearly the same weight, and are intended to be ballistically similar to each other. The cartridges are designed to achieve a range of over 7,000 meters.

The M934A1 is a combination of the original M934 Cartridge and the M734A1 MultiOption Fuze for Mortars (MOFM). The M734A1 has four different function modes that are hand-selectable. They are: Impact (IMP), Delay (DLY), and two Proximity (PRX) settings (a 7foot setting for the 60mm and 81mm mortars, and a 14-foot setting for the 120mm mortar). The M734A1 requires two distinct stimuli to arm the fuze. The first is a setback acceleration for the time duration of in-bore travel of the projectile. The second is ram airflow through the ports in the ogive that rotate the turbine. This provides two independent arming mechanisms that comply with the dual safety requirements of Military Standard (MIL-STD)-1316D (Criteria for Fuze Design Safety). The fuze senses the presence of radio frequency (RF) emitters within the fuze RF detection band and desensitizes to prevent early fuze function. In the mode, the fuze will function at the specified above-ground-level height of burst (HOB), with an impact and delay backup function. The IMP mode will cause the fuze to function when the projectile impacts the ground surface and will have a delay function as backup. The DLY mode will cause the fuze to function approximately 30 to 150 milliseconds after projectile impact. The projectile consists of a steel body with Composition B explosive fill, a plastic split-ring obturator, and an aluminum tail fin assembly. The propelling charge system consists of a waterproof M1020 ignition cartridge and primer and four M234 horseshoe-shaped propellant increments.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Mortar- 120mm- Cartridge- M934A1E1

**Reference** (Modica et al., 2006):

Modica, A., Juba, J., Dobbs, S., Taylor, B., & Buell, B. (2006). System Evaluation Report (SER) for the 120mm High Explosive Cartridge, M934A1E1. Production Qualification Test U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 61129117. DTIC ADB317166.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

140200 - Test Facilities, Equipment and Methods

190100 - Ammunition and Explosives

Descriptors:

(U) \*ACCEPTANCE TESTS, \*HIGH EXPLOSIVE AMMUNITION, COOK OFF, FIRING TABLES, TEST FACILITIES

Identifiers:

(U) SYSTEM EVALUATION REPORT, M934A1E1 120mm HIGH EXPLOSIVE (HE) CARTRIDGE

**System Description:**

The M934A1 HE, M933 HE, M930 Illuminating, and M929 Smoke Cartridges make up the current family of ammunition for the BMS. All cartridges have the same external shape, approximately the same weight, and are intended to be ballistically similar. The cartridges are designed to achieve a range of more than 7000 meters. The M934A1E1 will provide Soldiers with an HE round that better meets IM requirements as specified in United States Department of Defense Directive 5000.2-R.

**a. The M934A1E1** is assembled with the M734A1 multi-option fuze, which has four function modes. The four hand-selectable fuze settings are Impact (IMP), Delay (DLV), and two Proximity (PRX) settings (a 7-foot setting for the 60mm and 81mm mortars, and a 14-foot setting for the 120mm mortar). The M734A1 requires two distinct stimuli to arm the fuze. The first is setback acceleration for the time duration of in-bore travel of the projectile. The second is ram airflow through the ports in the ogive that rotate the turbine. This provides two independent environments that comply with the dual safety requirements of Military Standard (MIL-STD)1316D (Criteria for Fuze Design Safety). The fuze senses the presence of radio frequency (RF) emitters within the fuze RF detection band and desensitizes to prevent early fuze function. In the PRX mode, the fuze will function at the specified above-ground-level height of burst (HOB), with an impact and delay backup function. The IMP mode will cause the fuze to function when the projectile impacts the ground surface and will have a delay function as backup. The DLY mode will cause the fuze to function approximately 30 to 150 milliseconds after projectile impact.

**b. The projectile** consists of a 1090 steel body and HBU-88B explosive fill, which has improved IM characteristics, a plastic split-ring obturator, and an improved aluminum tail fin assembly. The metal packaging has been replaced by a polymeric material (PA 174 monopack container) that has improved resistance to sympathetic detonation. A reduced thread fuze adapter has been incorporated to aid in cartridge venting. The propelling charge system consists of a waterproof M1020 ignition cartridge and primer and four M234 horseshoe-shaped propellant increments.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Mortar- 120mm- Cartridge- Stowage Kit

**Reference** (Modica et al., 2007):

Modica, A., Wallace, P., Dobbs, S., Lloyd, T., Wetzel, R., Juba, A., Taylor, B., Garcia, T., & Hodg, M. (2007). System Evaluation Report (SER) for the Type Classification Decision for the Stowage Kit: 120mm Mortar, XM326: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 731710002. DTIC ADB333036

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*LOGISTICS SUPPORT, \*RELIABILITY, \*MORTARS, ACCEPTANCE TESTS, MILITARY REQUIREMENTS, PERFORMANCE TESTS, ADVERSE CONDITIONS, ARMY PERSONNEL, INTEROPERABILITY, OPERATIONAL EFFECTIVENESS

Identifiers:

(U) \*STOWAGE KITS, 120mm

**System Description:**

The XM326 is a device designed to allow emplacement and displacement of an assembled M120 120mm Mortar onto a prime mover (M1101/M1102 Light Tactical Cargo Trailer (LTCT). or Self-propelled M998 High Mobility Multipurpose Wheeled Vehicle (HMMWV) vehicle). The XM326 is a powered device that allows the mortar to be carried on the vehicle as a single unit and deployed to the ground at the rear of the prime mover. This device incorporates a strut that holds the mortar tube, baseplate, and bipod solidly as a unit. This assembly is then lifted by a stow device onto or off of the vehicle. To load the mortar onto the weapon vehicle, the first step is to lock the mortar baseplate, tube, and bipod in a fixed position to restrict relative motion during the lift. This thing of the components is accomplished through the use of a tubular steel welded strut that cams into hooks added to the baseplate. The upper end of this A-shaped component is attached to the mortar tube with a clamp fastened with an over center latch. Two additional arms reach forward from the strut, providing support and a latching location for the bipod. The XM326 consists of the following seven subsystems:

- a. The lift drive provides the means to lift the 120mm mortar assembly by engaging a lifting lug on the mortar support strut assembly attached to the 120mm mortar.
- b. The power pack provides electrical and hydraulic power to the XM326.
- c. The mortar strut provides an interface between the carrier platform and the mounting structure for the other XM326 components.
- d. The guide rails provide support and guidance for the mortar and strut during deployment and retrieval.
- e. The mortar support strut serves to hold the mortar baseplate, tube, and bipod together as a solid unit to allow the lift into and off the carrier platform.
- f. The tube support provides a forward support for the mortar and strut assembly when lifted into the carrier.
- g. The ammunition racks, which are components of the basic issue items (BII), consists of two horizontal and one vertical racks each of which can stow up to eight each 120mm mortar cartridges.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Mortar- 120mm- Cartridge- WP M929

**Reference** (Modica et al., 1998):

Modica, A., Abeyta, R., Heatwole, C., & Luedtke, L. (1998). System Assessment (SA) for the Production Verification Test of the 120mm M929 White Phosphorus (WP) Smoke Cartridge: U.S. Army Test and

Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. USAEAC,  
APG, MD. DTIC ADB240244

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)  
Fields and Groups:

190101 - Pyrotechnics

Descriptors:

(U) \*SMOKE MUNITIONS, \*WHITE PHOSPHORUS, ACCEPTANCE TESTS, WEAPON SYSTEM  
EFFECTIVENESS, MORTAR FUZES

Identifiers:

(U) \*120-MM SMOKE CARTRIDGE, M929 CARTRIDGE

**System Description:**

The M929 Cartridge is to be the standard smoke obscuration round for the 120mm M120 Carrier-Mounted and M121 Towed Mortars. The M929 has the same external characteristics as the 120mm M934/M933 High Explosive (HE) Cartridges. The M929 characteristics include a steel tube body, a plastic split-ring obturator, and the M31 aluminum tail fin assembly. The propelling charge system consists of the M981 waterproof ignition cartridge and primer and the four M230 horseshoe-shaped removable propellant increments. It is 27.9 inches long, weighs approximately 31 pounds, and contains a payload of 144 WP-saturated felt wedges of various sizes that provide a ground screening smoke for upwards of 3 minutes when exposed to air. The M929 is assembled with the M734AI MultiOption Fuze, which has four function modes that can be selected. These function modes are 120mm Proximity (14 feet ± 3 feet), 81/60mm Proximity (7 feet ± 3 feet), Impact, and Delay. When the fuze functions in the proximity mode, a burster charge fragments the steel body and disperses the WP wedges around the target area. The resulting WP smoke cloud should provide more effective obscuration of the target area than bulk-filled WP smoke cartridges.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Mortar- 120mm- Cartridge- XM930 Illumination

**Reference** (Modica et al., 2003):

Modica, A., Heatwole, C., Teletski, L., Houghton, G., & Bullett, M. (2003). System Evaluation Report (SER) for the Production Verification Test of the XM930 120mm Illumination Cartridge: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 30938804. DTIC ADB287632.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*ILLUMINATION, \*CARTRIDGES, OPTIMIZATION, DECISION MAKING, OPERATIONAL  
EFFECTIVENESS, ARMY EQUIPMENT, CLASSIFICATION, SYSTEMS ANALYSIS, LOW RATE,  
MORTARS

Identifiers:

(U) 120-MM CARTRIDGES, XM930 VISIBLE ILLUMINATING CARTRIDGES

**System Description:**

The XM930 is fired from the M120 Towed Mortar or the M121 Carrier Mortar. These 120mm Battalion Mortars are muzzle-loaded, smooth-bore tubes configured with the M298 Cannon Assembly, M191 Bipod Assembly, and M9 Baseplate.

The XM930 illuminates in the visible region of the electromagnetic spectrum from 0.4 to 0.7 micrometers (10-6 ). The cartridge is designed to have the same external physical characteristics as the other 900 series 120mm cartridges. The XM930 will be assembled with the M776 Mechanical Time Super Quick Fuze, which can be set to function from 6 to 54 seconds. The configuration employed during the FAT, LAT, and majority of the PVT included the M31 fin assembly, M1020 ignition cartridge, and four horseshoe-shaped M234 propellant increments. The fielded configuration will utilize the M31 fm assembly, M981 ignition cartridge, and four horseshoe-shaped M230 propellant increments. Differences between the M981 and M1020 ignition cartridges are that the M981 uses a stick propellant and loose black powder, while the M1020 uses ball powder and five pressed black powder pellets. The black powder pellets have been determined to be a contributing cause to short rounds within the 120mm ammunition family, resulting in a future redesign of the M1020. The M230 is a flake propellant, while the M234 is a ball propellant. Future LATs and the Firing Tables retest utilize the M981/M230 configuration. The XM930 is 27.7 inches long and weighs 31.4 pounds.

When the XM930 is dropped down the mortar tube, a firing pin located on the bottom of the tube initiates the ignition cartridge. The ignition cartridge then ignites the propellant increments resulting in the formation of combustion gases. The gases propel the round out of the mortar tube toward the target area. At a preset time, the M776 fuze functions, ejecting the candle assembly and parachute from the tail cone. The parachute then opens, slowing the descent of the illuminating candle.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Mortar- 120mm/107mm/81mm/60mm- Computer- LHMBC XM32

**Reference** (Dillen et al., 2005):

Dillen, M., Payne, M., Pandullo, M., Zirhut, M., Rambo, P., Rice, C., Whitmark, C., Jacobson, C., & Robinson, J. (2005). System Assessment (SA) for the Lightweight Hand-Held Mortar Ballistic Computer (LHMBC): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB313141.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

120500 - Computer Programming and Software

190600 - Guns

191000 - Ballistics

Descriptors:

(U) \*COMPUTER PROGRAMS, \*FIRE CONTROL SYSTEMS, \*MORTARS, MORTAR AMMUNITION, BALLISTICS, SUBCALIBER PROJECTILES, HAND HELD, LIGHTWEIGHT, SYSTEMS ANALYSIS

Identifiers:

(U) LHMBC(LIGHTWEIGHT HAND HELD MORTAR BALLISTIC COMPUTER)

**System Description:**

The LHMBC will provide the software functionality of the Mortar Fire Control System (MFCS) in a dismounted mode and replace the M23 Mortar Ballistic Computer. The LHMBC is based on a modified non-developmental item Ruggedized Personal Digital Assistant (R-PDA) purchased from the PM Common Hardware and Software at Fort Monmouth, NJ. LHMBC hardware is produced by Talla Tech Corporation in Florida and provided through General Dynamics, the prime contractor. The overall dimensions of the LHMBC are 3.5 by 6.2 by 2.35 inches. The approximate weight of the LHMBC is 23.5 ounces. Manpower requirements will not be increased. Use of the LHMBC will not require any additions to the crew, the FDC, or the maintenance military occupational specialty (MOS). The LHMBC system is designed to provide improved capabilities to calculate ballistic solutions for full and sub-caliber training ammunition and all current U.S. Army mortar cartridge and fuze combinations. The LHMBC must

enhance speed and accuracy for targeting and coordination of supporting indirect mortar fires. Additionally, the system is expected to provide the essential functions of mortar fire control; (manual and digital), computation of ballistic solutions, registration, immediate smoke, illumination (range spread, lateral spread); Traversing Fire Suppression, and receiving meteorological data (MET).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Mortar- 120mm/107mm/81mm/60mm- Computer- MBC M30

**Reference** (Oliver et al., 2000):

Oliver, S., Heatwole, C., Jones, D. T., Abeyta, R., Smoot, D., Modica, A., Rickey, J. K., & Riemenschider, J. (2000). System Evaluation Report (SER) for the M30 Mortar Ballistic Computer: U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB259646.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

120600 - Computer Hardware

190500 - Fire Control and Bombing Systems

191000 - Ballistics

Descriptors:

(U) \*FIRE CONTROL COMPUTERS, SOFTWARE ENGINEERING, SURVIVABILITY, PERFORMANCE(ENGINEERING), OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, SYSTEMS ANALYSIS, COMPUTER PROGRAM VERIFICATION, MANPORTABLE EQUIPMENT, BALLISTICS, HAND HELD, MORTARS, DATA PROCESSING TERMINALS

Identifiers:

(U) MBC(MORTAR BALLISTIC COMPUTER)

**System Description:**

The M30 MBC is a data entry terminal and computer used for automated computation and display of mortar related information and communication with the ANIPSG-7 Forward Entry Device (FED) through standard Army communication radios and field wire.

Hardware. The hardware for the M30 MBC is the Handheld Terminal Unit (HTU), a lightweight, portable, battery powered computer with a built-in display, an internal modem, and one interface port. The HTU was developed as part of the Common Hardware Suite (CHS-2) and not as part of the M30 MBC project.

Software. The M30's software consists of a Disk Operating System, communications software, and functional software developed by the Armament Research, Development, and Engineering Center (ARDEC), Life Cycle Software Engineering Center (LCSEC) and the Fire Support Armaments Center's Firing Tables Branch. The functional software consists of the Operational Processor and the Ballistic Kernel. The Ballistic Kernel is a self-contained software module that performs the ballistic computations required by the M30 MBC.

Capability. The M30 MBC is designed to calculate all fire control information necessary to lay and fire the US Army's **60mm, 81mm, 107mm, and 120mm** mortar systems. The system accommodates all ammunition types and fuse combinations currently in use for these mortars and communicates via digital burst transmissions assuring the efficient transfer of mission data without relying on voice communication entirely. Due to the phasing out of the 107mm from the Army's inventory, the AST decided that the M30 MBC in a 107mm FDC environment did not need to be tested.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or

potentially significant military application. Other requests for this document must be referred to  
Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458:

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**System Short Name:** SER- MPCV

**Reference** (Landy et al., 2002):

Landy, K., Addison, C., Brabson, G., Tovar, G., & Mallamo, J. (2002). System Evaluation Report (SER) for the Mine Protected Clearance Vehicle (MPCV): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 20708619. DTIC ADB276784.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

050200 - Information Science

130600 - Surface Transportation and Equipment

150601 - Naval Surface Warfare

Descriptors:

(U) \*MILITARY VEHICLES, \*MINE DETECTION, \*MINE CLEARANCE, TEST AND EVALUATION, INTEGRATED SYSTEMS, SURVIVABILITY, INTEROPERABILITY, SECURITY, OPERATIONAL EFFECTIVENESS, CLASSIFICATION, TELEOPERATORS, COUNTERMINING

Identifiers:

(U) MPCV(MINE PROTECTED CLEARANCE VEHICLE), \*MINE PROTECTED CLEARANCE VEHICLE

**System Description:**

a. The candidate systems are the CASSPIR MK II and the LION II (BUFFALO). The candidate systems are NDI-COTS wheeled, armored vehicle platforms designed to operate safely in anti-tank (AT) and anti-personnellandmine infested environments, while also providing a limited mine interrogation and clearance capability. These platforms are designed to provide the highest possible level of crew protection against mine blasts. The MPCV crew consists of the vehicle driver, the squad leader, and up to six additional soldiers. The system is also designed to provide crew compartment ballistic protection against 7.62mm NATO ball ordnance.

b. The MPCV includes a hydraulic arm, mounted on the front bumper, which is used to investigate areas marked as suspected mine locations. This arm provides the MPCV crew the capability to discriminate' false alarms from actual mine locations by partially exposing buried landmines without being exposed to the hazards of an unintended mine detonation. The arm can also be used to pick the mine up and to place it off the side of the road for later neutralization by follow-on combat engineer soldiers.

c. The selected MPCV vehicle will serve as the CV for teleoperation of the GSTAMIDS Block 0 MDV, as well as provide enough space for a combat engineer squad (minimum of five soldiers) and all their standard equipment to conduct their countermine mission.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- MRCD

**Reference** (Brown et al., 1999):

Brown, P. L., Barrett, C. J., Knuckles, S. C., & Zwicke, R. A. (1999). System Evaluation Report (SER) for the XM37 Mid-Sized Riot Control Disperser (MRCD): U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. APG, MD. Report #: 92158103. DTIC ADB245446.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

050500 - Sociology and Law

150603 - Chemical, Biological and Radiological Warfare

Descriptors:

(U) \*DISPERSANTS, \*RIOT CONTROL, \*RIOT CONTROL AGENTS, ACCEPTANCE TESTS, PRODUCTION, OPERATIONAL EFFECTIVENESS, SYSTEMS ANALYSIS, TEST FACILITIES, MILITARY POLICE

Identifiers:

(U) MRCD(MIDSIZED RIOT CONTROL DISPERSER). XM37 MIDSIZED RIOT CONTROL DISPERSER

**System Description:**

The XM37 MRCD, a Soldier Enhancement Program (SEP), is a pressurized bottle of liquid riot control agent (RCA), similar to a small fire extinguisher, with a nozzle for directing a stream or spray. US Forces involved in Military Operations Other Than War (MOOTW) will use it for establishing and maintaining law and order and countering civil disturbances. Additional uses can include segregation of belligerents, hostage rescue missions, and capture of criminals, terrorists, and other adversaries across the spectrum of military operations. The MRCD and its associated RCA will be used to apply the minimum force necessary by military forces while performing these missions. The MRCD will fill the gap between small, hand-held dispersers like the M39 and the large, cumbersome, backpack devices like the M33A1. The XM37 MRCD will be capable of dispersing approved liquid RCAs, potential agents, and powdered agents.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- MSDE

**Reference** (AEC, 2006):

AEC. (2006). System Assessment (SA) for the Army's Role in Multi-Service Distributed Test Event (MSDE): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB320043.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

150600 - Military Operations, Strategy and Tactics

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*ARMY RESEARCH, \*CLOSE SUPPORT, \*TACTICAL AIR SUPPORT, \*JOINT MILITARY ACTIVITIES, \*ARMY OPERATIONS, \*JOINT TEST AND EVALUATION, \*SYSTEMS ANALYSIS, SCENARIOS, MODELS, TEST FACILITIES, INFRASTRUCTURE, PEER GROUPS, CONFIGURATION MANAGEMENT, DECOMPOSITION, OPERATIONAL EFFECTIVENESS, MISSIONS, FEASIBILITY STUDIES, TEST METHODS, NETWORKS, SIMULATION

Identifiers:

(U) \*MULTISERVICE DISTRIBUTED EVENT, \*CLOSE AIR SUPPORT, MSDE(MULTI SERVICE DISTRIBUTED EVENT), JCAS(JOINT CLOSE AIR SUPPORT), SUT(SYSTEM UNDER TEST), LVC(LIVE/VIRTUAL/CONSTRUCTIVE), LIVE VIRTUAL CONSTRUCTIVE EVENT, WORKING GROUPS, JTEM(JOINT TEST AND EVALUATION METHODOLOGY), TOEL(TIME ORDERED EVENT LIST), NETWORK CENTRIC FORCE, MODELING AND SIMULATION, DISTRIBUTED TESTING, TEST SITES

**System Description:**

This report documents the Army Evaluation Center's (AEC) technical support to the Joint Test and Evaluation Methodology (JTEM) Joint Feasibility Study (JFS). It is an assessment of the Army's involvement in the Multi Service Distributed Event (MSDE). Specifically, it documents (1) the Army's methodology to decompose the Joint Close Air Support (JCAS) mission, (2) the identification and decomposition of performance measures, (3) the identification of data needed to address the performance measures, and (4) the capability of the MSDE to produce valid system under test (SUT) data usable by the evaluation community.

The MSDE achieved significant technical accomplishments and demonstrated the capability of the Army, Air Force, and Navy to conduct a distributed Live/Virtual/Constructive (LVC) event. As a member of the MDSE Analysis Working Group (AWG), the Army Evaluation Center (AEC) provided an evaluation methodology and performance measures to determine the Army's contribution to the JCAS mission thread.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- M-TADS/PNVS

**Reference** (Elam et al., 2005):

Elam, J., Rivera, E., Weigle, N., Escudero, L., Durbin, D., Mazz, J., Bledsoe, B., West, R., Prather, M., Evans, B., Stone, R., & Payne, D. L. (2005). System Assessment (SA) for the Modernized Target Acquisition Designation Sight/Pilot's Night Vision Sensor (M-TADS/PNVS): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADC071736. Report Classification: SECRET/NOFORN. Citation Unclassified.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

170501 - Infrared Detection and Detectors

230400 - Protective Equipment

Descriptors:

(U) \*FORWARD LOOKING INFRARED SYSTEMS, \*TARGET ACQUISITION, \*NIGHT SIGHTS, TEST AND EVALUATION, INFRARED DETECTION, TARGET RECOGNITION, OPERATIONAL EFFECTIVENESS, MAINTAINABILITY, MILITARY MODERNIZATION, LASER TRACKING, RANGE FINDING, SYSTEMS ANALYSIS, HUMAN FACTORS ENGINEERING, PILOTS, LASER TARGET DESIGNATORS, PERFORMANCE(ENGINEERING), SURVIVABILITY

Declassification:

OADR

Identifiers:

(U) M-TADS/PNVS(MODERNIZED TARGET ACQUISITION DESIGNATION SIGHT/PILOTS NIGHT VISION SENSOR), M-TADS(MODERNIZED TARGET ACQUISITION DESIGNATION SIGHT), PNVS(PILOTS NIGHT VISION SENSOR)

**System Description:**

(U) The M-TADS/PNVS System Assessment (SA) reports on system effectiveness, suitability, and survivability. This document constitutes ATEC input to the M- TADS/PNVS Materiel Release (MR) decision for First Unit Equipped (FUE), scheduled for 23 and 30 June 2005.

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this

document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- MTS

**Reference** (Bax and Dixon, 2001):

Bax, K. G., & Dixon, H. L. (2001). System Evaluation Report (SER) for the Movement Tracking System (MTS) Block I: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 11108439. DTIC ADB265659.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

170700 - Navigation and Guidance

250200 - Radio Communications

Descriptors:

(U) \*TRACKING, \*SATELLITE TRACKING SYSTEMS, TEST AND EVALUATION, POSITION(LOCATION), OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, GLOBAL POSITIONING SYSTEM, MILITARY APPLICATIONS, GROUND VEHICLES, INPUT OUTPUT DEVICES, SYSTEMS ANALYSIS, MESSAGE PROCESSING, RELAYS

Identifiers:

(U) MTS(MOVEMENT TRACKING SYSTEM), WIRELESS COMMUNICATION

**System Description:**

The MTS Block I is non-developmental item (NDI) integrated system. It is a collection of commercially produced stand-alone components that have been integrated into a system. These components include a Global Positioning System (GPS) receiver, Windows intel based computing platforms, system support software, installation kits, satellite transceivers, and a satellite based communications network. Each of these technologies is in existence today and used commercially and when packaged, as an integrated system, will make up the three subsystems of MTS - the Control Station (CS), the mobile unit-vehicle mounted (V2), and the mobile unit-hand held (VI). The CS and V2 are part of MTS Block I and VI is part of MTS Block II. MTS Block I incorporates non line-of-sight communication and mapping technologies into a package that provides transporter and eventually cargo visibility throughout the world. Currently the primary function of the MTS Block I will be the tracking of and communicating with transportation vehicles by movement control management personnel.

The MTS Block I is part of a planned suite of digitization additions planned for Tactical Wheeled Vehicles (TWV) and will play a vital role in future battlefield operations. Its primary function will be the tracking of and communication with transportation vehicles by movement control management personnel. Both the maneuver commander's mission capability and the logistical commander's support capability will be improved by the use of the MTS Block 1. Based on lessons learned from our most recent campaigns, the inability to track, communicate with and reroute TWV resulted in the inefficient use of limited assets by increasing risk to personnel and equipment, and causing delivery of supplies to incorrect locations or where the requirement no longer existed. MTS Block I will provide the capability to prevent a repeat of these and similar situations. It is what the transportation system needs to provide commanders with near-real-time data on the location and status of movements.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- NBC- Decon- MDS

**Reference** (Chipman et al., 1999):

Chipman, M. E., Holman, C., Finanger, K., Fuller, J., & Brown, P. (1999). System Evaluation Report (SER) for the Modular Decontamination System (MDS): U.S. Army Test and Evaluation Command (ATEC) (Formerly U.S. Army Operational Test and Evaluation Command- OPTEC), ATTN: CSTE-EAC-CC, Park Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB249313.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

150603 - Chemical, Biological and Radiological Warfare

Descriptors:

(U) \*DECONTAMINATION, WATER, MILITARY VEHICLES, NEUTRALIZATION, MODULAR CONSTRUCTION, SAFETY, CONTAMINATION, BIOLOGICAL WARFARE AGENTS, TACTICAL WARFARE, CHEMICAL WARFARE AGENTS, DECONTAMINATION MATERIALS

Identifiers:

(U) EXPORT CONTROL, NUCLEAR WARFARE AGENTS, MDS(MODULAR DECONTAMINATION SYSTEM), TACTICAL DECONTAMINATION

**System Description:**

The MDS is designed to reduce the necessary quantity of water and decontamination solution, and improve equipment processing time without increasing the labor or skills required for decontamination of equipment. The MOS consists primarily of two separate modules. The XM21 OP is used to dispense and brush/scrub DS2 and other liquid field expedient decontamination solutions. This module includes a diesel power driven pump assembly, a hose accessory kit, and an electrically powered brush assembly kit. The engine is a 6-HP diesel, single cylinder with fuel injection. Additionally, the XM21 DP can be manually or electrically (battery) started, and it is equipped with a North Atlantic Treaty Organization (NATO) standard receptacle. The MDS also provides two independent high pressure/hot water modules (XM22 HPW) for removal of gross contamination, rinsing Decontaminant, and personnel showering. It can operate from any water source. The XM22 HPW is powered by a diesel engine that drives a high pressure pump and a high volume flow pump. The module is electrically started, and it is equipped with a NATO STD receptacle for using a slave cable as an alternate electrical power source. Water passes through a heating coil into two 75-foot-long hoses and is dispensed using operator-controlled spray wand(s) attached to the end of each hose. This module has the capability to shower up to eight people at a time for personnel hygiene showering.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- NBC- Detector- ACADA

**Reference** (Webb et al., 1998):

Webb, W., Tackett, S., Fuller, J., Musgrave, D., & Holman, C. (1998). System Assessment (SA) for the Automatic Chemical Agent Detector Alarm (ACADA): U.S. Army Evaluation Analysis Center., Aberdeen Proving Ground, MD 21005-3013. DTIC ADB239285.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

150603 - Chemical, Biological and Radiological Warfare

170800 - Miscellaneous Detection and Detectors

Descriptors:

(U) \*CHEMICAL AGENT DETECTORS, \*TOXIC AGENT ALARMS, TEST AND EVALUATION, ARMY RESEARCH, SURVIVABILITY, SYSTEMS ANALYSIS, AUTOMATIC, NERVE AGENTS

Identifiers:

(U) ACADA(AUTOMATIC CHEMICAL AGENT DETECTOR ALARM), \*ASSESSMENT, NBC SURVIVABILITY, ION MOBILITY SPECTROMETRY

**System Description:**

The XM22 ACADA is an advanced point-sampling, man-portable, automatic chemical agent detector and alarm system. Like the Chemical Agent Monitor (CAM), the ACADA's detection technology is based on ion mobility spectrometry (IMS) in which chemical agent vapor molecules are ionized by exposure to beta particles causing them to form characteristic ionmolecule products which can be separated and identified by their relative speeds of travel (mobilities) in an electric field. The ACADA improves the technology employed in the CAM in several areas; it has a water-based and an ammonia-based chemistry system (allows use with the standard charcoal filters used inside shelters); it can concurrently (without switching and allowing time to clear as is required for the CAM) detect, identify, and provide an indication of the magnitude of nerve or blister agent contamination; it can be placed upwind to warn of an approaching hazard; and it is designed for integration with the Multipurpose Integrated Chemical Agent Alarm (MICAD). The ACADA is also intended to have improved sensitivity (detect a lesser challenge concentration) over the currently fielded M8A1 alarm. (The M8A1 is an outdoors only, nerve agent alarm that is placed upwind to warn of an approaching hazard.) Operationally, the ACADA will replace and/or complement the M8A1 alarm as an automatic point detector and may augment the CAM as a survey instrument.

The basic ACADA system will consist of the detector, transit case, M42 remote alarm, and battery assembly. Depending on the mode of operation, associated elements of the alarm may include the XM279 air sampling kit, XM28 power supply, and XM281 vehicle mounting kits. Consumable items include the dust filters, BA 5590 batteries, and confidence samples.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- NBC- Detector- BIDS P3I

**Reference** (Musgrave et al., 2000):

Musgrave, D., Holman, C., Tackett, S., Finanger, K., Fuller, J., Jernigan, R., Hillard, T., & Sleeper, C. (2000). System Evaluation Report (SER) for the Biological Integrated Detection System (BIDS) Preplanned Product Improvement (P3I): U.S. Army Test and Evaluation Command (ATEC) (Formerly U.S. Army Operational Test and Evaluation Command- OPTEC), ATTN: CSTE-EAC-CC, Park Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB258054.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

150603 - Chemical, Biological and Radiological Warfare

Descriptors:

(U) \*BIOLOGICAL AGENT DETECTORS, TEST AND EVALUATION, INTEGRATED SYSTEMS, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, SYSTEMS ANALYSIS, BIOLOGICAL DETECTION, BIOLOGICAL WARFARE AGENTS

Identifiers:

(U) EXPORT CONTROL, BIDS(BIOLOGICAL INTEGRATED DETECTION SYSTEM)

**System Description:**

The BIDS P3I consists of both biological detection and identification equipment as well as sampling equipment. These are integrated into an S788 Lightweight Multipurpose Shelter mounted on an MI079 High Mobility Multipurpose Wheeled Vehicle (HMMWV). In addition to the detection equipment, the shelter includes collective protection and environmental control equipment, navigation, meteorological and communication systems, and power distribution equipment. A towed 15-kW generator was the

primary power source. The BIDS P3I was used for detecting, confirming, and warning that a biological attack has occurred. The system provides presumptive identification and collects samples for later laboratory analysis. The system is required to detect any generic biological warfare agent and identify 8 of them at a concentration of 15 or more Agent Containing Particles per Liter of Air (ACPLA). The purpose of the product improvement is to reduce the time to detection to 10 minutes, reduce the time to complete both detection and identification to 30 minutes, and to increase the sensitivity of the system.

The following components make up the BIDS P3I:

- (1) Vehicle - M1097 Heavy HMMWV.
- (2) Navigation - ANIPSN-II Precision Lightweight Global Positioning System (GPS) Receiver.
- (3) Generator - PU-801 15-kW Power Unit.
- (4) Shelter - S788/G Lightweight Multipurpose Shelter
- (5) Biological suite components:
  - Ultra-Violet Automatic Particle Sizer (UVAPS)
  - Chemical Biological Mass Spectrometer (CBMS)
  - Mini-Flow Cytometer (FCM)
  - Biological Detector (BD)
  - Hand-Held Assay (HHA)
  - Improved Liquid Sampler (LS)
  - Improved Biological Sampler (BS)
  - Central Information Processor (CIP) and second Operator Display
  - Serial Communication Interface
  - Laser Jet Printer
- (6) Collective Protection. M93 Gas-particulate Filter Unit at 100 Cubic Feet per Minute (CFM).
- (7) Communications. Harris 400-Watt High Frequency-Single Side Band (HF-SSB) Radio and a Single Channel Ground to Airborne Radio System (SINCGARS) ANNRC-90A Radio Set.
- (8) Environmental Control. 18,000 BTUH Air Conditioner.
- (9) Meteorology. Tactical Meteorological (TACMET) II Weather Sensor.
- (10) Electronic Technical Manual (TM) on Notebook Computer.

The detection process starts when either the UVAPS or CBMS alerts. Both the UVAPS and CBMS continually monitor the air. The UVAPS counts biological particles in several size categories. The CBMS examines molecules to determine if they are of biological origin. An alert indicates that there are organic particles present, which may represent an aerosol cloud and a potential-biological attack. An alert signals the liquid and bio-samplers to turn on. The liquid sample is used for further analysis in the BIDS P3I. The sample from the bio-sampler is stored for subsequent evacuation. Detection occurs when it is known that the aerosol that triggered the alert is an ABO. Either the FCM or the CBMS accomplishes detection. The FCM detects when it discovers nucleic acid (DNA or RNA) in particles of a certain size. The CBMS detects when it finds molecules that are indicative of ABO. The CBMS is used both as a trigger to signal an alert and as a detector. Detection is reported to platoon headquarters. Identification is accomplished by antigen antibody reactions in either the BD or the HHA. HHA are used as a backup if the BD is not working. Results from the BD or HHA are reported to platoon headquarters.

#### **Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- NBC- Detector- I-CAM

#### **Reference** (Tackett et al., 1998):

Tackett, S., Webb, W., & Fuller, J. (1998). System Assessment (SA) for the Improved Chemical Agent Monitor (I-CAM): U.S. Army Evaluation Analysis Ctr., 4120 Susquehanna Ave., Aberdeen Proving Ground, MD 21005-3013. DTIC ADB240164.

#### **Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

150603 - Chemical, Biological and Radiological Warfare

Descriptors:

(U) \*CHEMICAL AGENT DETECTORS, MATERIEL, DECONTAMINATION, REAL TIME, RELEASE, SYSTEMS ANALYSIS, MUSTARD AGENTS

**System Description:**

The Chemical Agent Monitor (CAM) is a lightweight, battery-powered, hand-held, postattack vapor detector designed to respond to nerve and mustard agent vapors on personnel, terrain, and equipment. It weighs approximately 4.5 pounds and measures 4 by 7 by 15 inches. The CAM is used to determine the presence of agent vapor in real time to indicate the need for decontamination of personnel, equipment, and supplies.

In order to reduce life cycle costs of the CAM, the I-CAM program was initiated. The I-CAM restructures the internal components of the CAM to reduce the maintenance burden, while leaving the performance and external physical characteristics unchanged. The I-CAM reduces the maintenance burden by:

- (1) Combining the two molecular sieves into one easily replaced modular package with double the life.
- (2) The maintenance level for replacing the sieve package was changed from Depot to Direct Support.
- (3) The electronic boards were redesigned and the number of printed circuit boards was reduced from three boards in the CAM to one in the I-CAM.

To minimize changes in operator training and most other aspects of logistical supportability, the I-CAM was designed to look and operate like the CAM. Most logistical supportability factors are the same for both systems. Transition to the I-CAM should be transparent to the soldiers except for property accountability actions inherent in any equipment transfer.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- NBC- Detector- JBPDS

**Reference** (Moe et al., 2008):

Moe, M., Jennings, C., Westerfield, T., Kuhne, P., Reaves, K., Catalano, E., Pianka, M., Wollenberg, L., & Lawrence, L. (2008). Operational Test Agency Evaluation Report (OER) for the Joint Biological Point Detection System (JBPDS) Limited User Test (LUT): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. ARMY EVALUATION CENTER ALEXANDRIA VA. DTIC ADB343398.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA), OTA Assessment Report (OAR), OTA Milestone "x" Assessment Report (OMAR), OTA Evaluation Report (OER), OTA Follow-on Evaluation Report (OFER), Operational Test Report (OTR), Abbreviated Operational Test Report (AOTR), Army Input to the OTA Report (AIOR)

\*biological agent detectors, \*biological agents, \*warning systems, \*decontamination, combat vehicles, biological aerosols, toxic agent alarms, fluidics, shelters, decision making, test and evaluation, operational effectiveness

jbpds(joint biological point detection system), \*joint biological point detection system, lut(limited user test), bbsu(basic biological suite unit), m1113 hmwv, hmwv(high mobility multipurpose wheeled vehicle), fts(fluidic transfer system), baws(biolo

Fields and Groups:

150300 - Defense Systems

Descriptors:

(U) \*BIOLOGICAL AGENT DETECTORS, \*BIOLOGICAL AGENTS, \*WARNING SYSTEMS, \*DECONTAMINATION, COMBAT VEHICLES, BIOLOGICAL AEROSOLS, TOXIC AGENT ALARMS,

FLUIDICS, SHELTERS, DECISION MAKING, TEST AND EVALUATION, OPERATIONAL  
EFFECTIVENESS

Identifiers:

(U) JBPDS(JOINT BIOLOGICAL POINT DETECTION SYSTEM), \*JOINT BIOLOGICAL POINT  
DETECTION SYSTEM, LUT(LIMITED USER TEST), BBSU(BASIC BIOLOGICAL SUITE UNIT), M1113  
HMMWV, HMMWV(HIGH MOBILITY MULTIPURPOSE WHEELED VEHICLE), FTS(FLUIDIC  
TRANSFER SYSTEM), BAWS(BIOLOGICAL AEROSOL WARNING SENSOR)

**System Description:**

**U.S. Army Shelter-Mounted Configuration.** The shelter-mounted JBPDS consists of the Basic Biological Suite Unit (BBSU) and associated attaching hardware installed in an S788 shelter mounted on an M 1113 high mobility multipurpose wheeled vehicle (HMMWV) (heavy variant) equipped with an onboard 10-kilowatt (kW) diesel generator. The shelter is collectively protected and environmentally controlled, containing the highly automated JBPDS, radios, and other ancillary support equipment. The 10-kW generator provides the necessary power to operate the BBSU and all ancillary equipment (environmental control unit (ECU), radios, meteorological system, lights, etc.). The system is equipped with an uninterruptible power supply that allows emergency switchover to vehicle battery power for continued emergency operations. The HMMWV engine must be started and must continue running to support continued surveillance operations if the generator power fails. The shelter mounted JBPDS does not require its ECU subcomponent since environmental conditioning for the JBPDS is provided by the ECU mounted in the front wall of the shelter.

**JBPDS Basic Bio-Suite Unit.** The JBPDS BBSU, is a fully automated and integrated unit consisting of a detector, collector, fluidics, and identifier to rapidly detect and identify biological threat agents. The detector, a Biological Aerosol Warning Sensor (BAWS), is an optical-based fluorescent sensor that constantly monitors the ambient aerosol background. Once the BAWS detects a change in fluorescent algorithm particle count, collection initiates. The collector entrains the suspect aerosol into a liquid sample. The Fluidic Transfer System (FTS) will then send this liquid sample to the Identifier for analysis using an immunoassay technology. Upon positive identification, audible/visual alarms are sent, and the sample is saved for confirmatory and definitive analysis.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- NBC- Detector- JBSDS

**Reference** (Kuria et al., 2004):

Kuria, I., Brown, T., Finanger, K., Meirose, S., & Ramsey, W. (2004). System Evaluation Report (SER) for the Joint Biological Standoff Detection System (JBSDS) Block 1: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 41538955. DTIC ADB299481.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

150603 - Chemical, Biological and Radiological Warfare

170800 - Miscellaneous Detection and Detectors

Descriptors:

(U) \*BIOLOGICAL DETECTION, \*BIOLOGICAL WARFARE AGENTS, \*BIOLOGICAL AEROSOLS,  
STANDOFF, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, WARNING SYSTEMS, BIOLOGICAL  
AGENT DETECTORS

Identifiers:

(U) EXPORT CONTROL, JBSDS(JOINT BIOLOGICAL STANDOFF DETECTION SYSTEM)

**System Description:**

The JBSDS will provide standoff detection, ranging, tracking, generic aerosol detection and discrimination (biological versus nonbiological) of biological warfare (BW) aerosol clouds for advanced warning, reporting and protection. The JBSDS Block 1 will be employed at fixed sites or in a stationary mode from mobile platforms such as the highmobility multipurpose wheeled vehicle (HMMWV). JBSDS Block 1 operators will relay alert information via radio or landline to existing command and control units. The X-BSDS and FPDLC candidates use an IR laser to detect aerosol clouds and the UV laser to discriminate biological warfare clouds from non-biological clouds. The JBSDS Block 2 will be employed to provide both mobile (on-the-move) detection of biological hazards and early warning via the Joint Warning and Reporting Network (JWARN). The JBSDS Block 1 consists of four major subcomponents:

- Infrared (IR)/ultraviolet (UV) operational eye safe laser transmitter.
- Receiving telescope/detector.
- Information processor and system control module.
- Gimbal stabilized platform.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- NBC- Detector- JBSDS

**Reference** (Kuria et al., 2005):

Kuria, I., Tackett, S., Meirose, S., Catalano, E., Heaps, E., Ramsey, W., Denning, T., & Cutler, C. M. (2005). System Evaluation Report (SER) for the Joint Biological Standoff Detection System (JBSDS) Increment 1: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 50217951. DTIC ADB305581.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

150603 - Chemical, Biological and Radiological Warfare

170800 - Miscellaneous Detection and Detectors

Descriptors:

(U) \*BIOLOGICAL DETECTION, \*BIOLOGICAL WARFARE AGENTS, \*BIOLOGICAL AEROSOLS, COMPUTER PROGRAMS, MILITARY FORCES(UNITED STATES), STANDOFF, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, LOGISTICS, DISCRIMINATION, WARNING SYSTEMS, BIOLOGICAL AGENT DETECTORS

Identifiers:

(U) LRIP(LOW-RATE INITIAL PRODUCTION), JBSDS(JOINT BIOLOGICAL STANDOFF DETECTION SYSTEM), EDT(ENGINEERING DEVELOPMENT TEST)

**System Description:**

The JBSDS Incr 1 will provide standoff detection, ranging, tracking, generic aerosol detection and discrimination (biological versus nonbiological) of clouds with particles of biological origin from clouds with particles of non-biological origin for advanced warning, reporting and protection. The JBSDS Incr 1 will be employed at fixed sites or in a stationary mode from mobile platforms such as the high-mobility multipurpose wheeled vehicle (HMMWV). JBSDS Incr 1 operators will relay alert information via radio or landline to existing command and control units. The JBSDS Incr 1 uses an infrared (IR) laser to detect aerosol clouds and the ultraviolet (UV) laser to discriminate BW clouds from non-biological clouds. The JBSDS Incr 2 will be employed to provide both mobile (on-the-move) detection of biological hazards and early warning via the Joint Warning and Reporting Network. The JBSDS Incr 1 consists of four major subcomponents:

\* IRAUV operational eye safe laser transmitter.

\* Receiving telescope/detector.

\* Information processor and system control module.

\* Gimbal stabilized platform.

The JBSDS Incr 1 is developed by the Science and Engineering Services, Incorporated (SESI). The system under test (SUT) is a Fluorescence Portable Digital Laser Imaging Detection and Ranging (LIDAR) (FPDL) system. It is a scalable/modular system adapted from SESI's commercial technologies. The system operates from a stationary position (i.e., installed on a platform, HMMWV, or larger vehicle). It has a 360-degree azimuthal scanner. The laser and scanner modules are connected by a fiber-optic link. The JBSDS Incr 1 is equipped with a LIDAR range finder. Its energy output in the detection (scan) mode for the IR laser is approximately 20 microjoule (pJ), and the IR energy output during the discrimination (stare) mode is about 2 /J. The energy output for the UV laser is 225 /J. The system operates with a pulse repetition frequency of 10 kilohertz and has a power consumption of 1.2 kilowatts (kW) - 1.5 kW. The system has a 12-inch telescope that uses a two degree per second scan rate. The current prototype system weighs 250 kilograms.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- NBC- Detector- JBSDS

**Reference** (Shirakawa et al., 2009):

Shirakawa, K., Cutler, C., Schmalkuche, F., Christino, A., Mosquito, R., Denning, T., Catalano, E., Heaps, E., Reed, K., Kao, D., Russell, C., & Piegzik, J. (2009). Operational Test Agency Evaluation Report (OER) for the Joint Biological Standoff Detection System (JBSDS) Increment I: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. DTIC ADC078285.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA), OTA Assessment Report (OAR), OTA Milestone "x" Assessment Report (OMAR), OTA Evaluation Report (OER), OTA Follow-on Evaluation Report (OFER), Operational Test Report (OTR), Abbreviated Operational Test Report (AOTR), Army Input to the OTA Report (AIOR)

\*biological detection, information assurance, simulation, experimental data, defense systems, information systems, verification, survivability, training, demonstrations, interoperability, health, damage assessment, vulnerability, test methods, lasers, o

jbsds(joint biological standoff detection system)

Fields and Groups:

150603 - Chemical, Biological and Radiological Warfare

Descriptors:

(U) \*BIOLOGICAL DETECTION, INFORMATION ASSURANCE, SIMULATION, EXPERIMENTAL DATA, DEFENSE SYSTEMS, INFORMATION SYSTEMS, VERIFICATION, SURVIVABILITY, TRAINING, DEMONSTRATIONS, INTEROPERABILITY, HEALTH, DAMAGE ASSESSMENT, VULNERABILITY, TEST METHODS, LASERS, OPERATIONAL EFFECTIVENESS, HUMAN FACTORS ENGINEERING, SAFETY, LOGISTICS, PROMOTION(ADVANCEMENT), PREVENTIVE MEDICINE, TEST AND EVALUATION, MILITARY FORCES(UNITED STATES)

Identifiers:

(U) JBSDS(JOINT BIOLOGICAL STANDOFF DETECTION SYSTEM)

**System Description:**

Joint Biological Standoff Detection System (JBSDS) Increment I.

**Report Availability:**

Secret/NoForN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current

technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- NBC- Detector- JCBRAWM

**Reference** (O'Malley et al., 2009):

O'Malley, C. M., Soubie, D. R., Secor, R. W., Phillips, M., Cash, L., Denning, T., Hildebrandt, D., Catalano, E., Clifford, S., Jackson, M., & Williams, C., Jr. (2009). Operational Test Agency Evaluation Report (OER) for Joint Chemical, Biological, Radiological Agent Water Monitor (JCBRAWM) Increment 1: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. ARMY EVALUATION CENTER ALEXANDRIA VA. DTIC ADB349318.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA), OTA Assessment Report (OAR), OTA Milestone "x" Assessment Report (OMAR), OTA Evaluation Report (OER), OTA Follow-on Evaluation Report (OFER), Operational Test Report (OTR), Abbreviated Operational Test Report (AOTR), Army Input to the OTA Report (AIOR)

\*biological agent detectors, \*drinking water, \*monitors, \*radiological warfare agents, water resources, operational effectiveness, survivability, test and evaluation, biological contamination operational suitability, \*jcbrawm(joint chemical biological and radiological agent water monitor), radiological contamination

Fields and Groups:

150603 - Chemical, Biological and Radiological Warfare

240400 - Water Pollution and Control

Descriptors:

(U) \*BIOLOGICAL AGENT DETECTORS, \*DRINKING WATER, \*MONITORS, \*RADIOLOGICAL WARFARE AGENTS, WATER RESOURCES, OPERATIONAL EFFECTIVENESS, SURVIVABILITY, TEST AND EVALUATION, BIOLOGICAL CONTAMINATION

Identifiers:

(U) OPERATIONAL SUITABILITY, \*JCBRAWM(JOINT CHEMICAL BIOLOGICAL AND RADIOLOGICAL AGENT WATER MONITOR), RADIOLOGICAL CONTAMINATION

**System Description:**

JCBRAWM Increment 1 will allow the Warfighter the ability to monitor drinking water sources for the presence of harmful biological and radiological agents. It will provide contamination information to the operator and assist commanders in making force protection decisions. The system supports tactical reconnaissance missions and monitoring of water generation and distribution sites at fixed sites.

Chemical detection is still handled by the M272 Water Test Kit.

The JCBRAWM Increment 1 includes Hand Held Assays (HHA) for detecting and identifying biological (Ricin and Staphylococcal Enterotoxin B (SEB)) contamination in water.

Water samples are placed in the sample well of the HHA. The water travels up the assay strip and reacts with antibodies embedded in the assay strip. A control line will form in approximately 5 minutes from inoculation confirming that the water has traveled throughout the assay strip. The presence of biological agents will also react with the antibodies and an indication line will appear within 15 to 20 minutes identifying the agent of contamination.

The JCBRAWM Increment 1 also includes components that will enable fielded AN/PDR-77, AN/PDQ-1 and ADM-300 radiation detection identification and computation (RADIAC) meters to detect radiological (gross alpha and beta) contamination in water. The USA configuration includes the AN/PDR-77. Both the USN and USAF kit configurations do not include a RADIAC meter with the kit. The users will requisition a RADIAC for use with the system.

The system components include an alpha/beta pancake probe for use with a corresponding RADIAC meter; a heat source for evaporating water; a stand to facilitate proper alignment of planchet and probe; stainless steel planchets for placing water samples; tweezers for manipulating planchets; pipettes for dispensing samples; and nitrile gloves.

A water sample is drawn from the sample bottle using a pipette and placed onto the planchet. The planchet is moved onto the heater using the tweezers and is heated until the sample is completely

evaporated. The planchet is then removed from the heater and allowed to cool. A radiological contamination reading is taken using the applicable probe and stand configuration.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- NBC- Detector- JSLSCAD

**Reference** (Kuria et al., 2006):

Kuria, I., Parks, A., Khan, A., Pritts, C., Seed, L., Chipman, J., Giese, J., Holman, C., & Timmerman, J. (2006). System Evaluation Report (SER) for the Joint Service Lightweight Standoff Chemical Agent Detector, Increment 1 (JSLSCAD Incr 1): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB324199.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

150603 - Chemical, Biological and Radiological Warfare

Descriptors:

(U) \*CHEMICAL VAPOR DEPOSITION, \*CHEMICAL AGENT DETECTORS, TEST AND EVALUATION, LINE OF SIGHT, STANDOFF, MISSIONS, CONTAMINATION, AUTOMATIC, WARNING SYSTEMS, RECONNAISSANCE, AVOIDANCE, INFRARED DETECTORS, OPERATIONAL EFFECTIVENESS, SURVIVABILITY, REAL TIME

**System Description:**

The JSLSCAD Incr 1 is a small, fully automatic, passive standoff chemical agent vapor detector. The unit is a line-of-sight infrared detector that will provide realtime, on-the-move, 360 degree chemical agent vapor standoff detection for contamination avoidance or reconnaissance missions. The JSLSCAD is intended to detect nerve and blister chemical agent vapors and provide for contamination avoidance and alarm on mobile missions. The JSLSCAD is equipped for visual and audible alarm and can display the chemical agent class and relative position of the detected chemical agent. This information will be made available locally and for transmission to the platform's communication system.

Key Features and Subsystems. Principles of Operation for Passive Infrared (IR) Detection: emission or absorption of energy at specific frequencies can be directly correlated to characteristic properties of a particular chemical compound. For a vapor, the strength of the signal is a function of:

- (1) the difference in temperature between the background and the chemical vapor ( $\Delta T$ ),
- (2) the vapor cloud's Concentration times Path Length (CL), and
- (3) the specific bonding structure within the chemical. When the signal passes through a spectrometer, it is transformed into a plot of absorption intensity versus wavelength, which has features that are characteristic of a chemical compound. It is these features that are used primarily to identify the chemical agent vapor.

The JSLSCAD Incr 1 employs a Fourier Transform Infrared (FTIR) spectrometer inside the Sensor Electronics Module (SEM) as a central component for detection, operating in the 8 to 12 micron band. The Scanner Module (SM), which scans 360 degree azimuth by -3 to +20 degrees elevation, provides azimuth and elevation of the threat vapor clouds relative to the platform. The JSLSCAD Incr 1 can be operated from its own Operator Display Unit (ODU), which also displays system status and detection information, or from the platform's on-board Central Data Processing Unit (CDPU) when integrated. The SEMISM is mounted through the top of the platform so that the scanner can freely rotate and scan the field of regard. The sensor can be integrated with the platform's CDPU for control and communication functions.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- NBC- Detector- MICAD

**Reference** (OPTEC, 1999):

OPTEC. (1999). System Evaluation Report (SER) for the Multipurpose Integrated Chemical Agent Alarm (MICAD): U.S. Army Test and Evaluation Command (ATEC) (Formerly U.S. Army Operational Test and Evaluation Command- OPTEC), ATTN: CSTE-EAC-CC, Park Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB249203.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

150603 - Chemical, Biological and Radiological Warfare

Descriptors:

(U) \*CHEMICAL AGENT DETECTORS, \*WARNING SYSTEMS, TEST AND EVALUATION, INTEGRATED SYSTEMS, SURVIVABILITY, COLD REGIONS, OPERATIONAL EFFECTIVENESS, MILITARY APPLICATIONS, SYSTEMS ANALYSIS, CONTAMINATION, TOXIC AGENT ALARMS, TROPICAL TESTS

Identifiers:

(U) MICAD(MULTIPURPOSE INTEGRATED CHEMICAL AGENT ALARM), NBC(NUCLEAR BIOLOGICAL CHEMICAL)

**System Description:**

The US Army identified the need for an integrated NBC detection and warning system to provide NBC warning and reporting to the battlefield deployed command structure. The MICAD system was developed for deployment with NBC detectors in the battlefield, combat and armored vehicles, tactical vehicles, vans, and shelters equipped with positive pressure collective protection equipment (PPCPE) and for vehicles, vans and shelters without PPCPE if they are on the command and control communications network.

a. The MICAD is an electronic warning and reporting system intended to provide near real-time NBC warning and reporting to the deployed battlefield command structure. It does so through the integration of the functions of tactical NBC detection and alarm, communication, position location and reporting devices, and Collective Protection Equipment (CPE) with which it is interfaced. The MICAD is intended to automate the currently laborious NBC warning and reporting process throughout the battlefield by automating the gathering of NBC contamination data from fielded NBC detectors and sensors, and automatically formatting and transmitting alarms and NBC-1/NBC-4 reports up the chain of command. Information sent to Battalion level will be received by the Maneuver Control System (MCS) and electronically entered into the . Battalion level MCS node.

b. The MICAD is designed to interface with the XM22 Automatic Chemical Agent Alarm (ACADA), the ANNDR-2 Radiation Detection, Indication, and Computation (RADIAC) with modified RS232 data port, other existing and developmental NBC detectors, Single Channel Ground and Airborne Radio System (SINGARS) radio, CPE, M42 Alarm, M43AI detector, Commander's Vehicle Communication Interface (CVCI), and Global Positioning System (GPS). Nondevelopmental items and future systems will not need to be modified to interact with the MICAD system because required interface standards and/or the MICAD support the capability to create necessary interface codes.

c. The MICAD is designed for employment in combat and tactical vehicles with positive-pressure CPE, as well as similar systems without such protection, but on the command, control, and communications (C3) network. The MICAD will interface with CPE to allow automatic activation of CPE in systems where this function is allowable when either NBC contaminants are detected or an alarm is received via the command, control (C2) network. The following items are being developed as elements of the MICAD system.

**(1) Display Control (DC).** This device is both the core of the system and the operator interface. It is intended to allow the operator to configure the system, determine and display system status through the Built-In-Test (BIT) function, monitor and display data received from an NBC detector or the C2 network, and automatically format and transmit an NBC-1 or NBC-4 report upon detection of an NBC hazard. The DC enables the operator to manually transmit an NBC report, if required.

(2) Interface Units (IU). Communications Interface Unit (CIU) and Universal Interface Unit (VIU). The CIU acts as the interface of the MICAD with the SINCGARS and TLR, while any of the remaining devices may be joined with appropriate multiples of UIUs concentrated in the Interface Architecture (IA). The UIUs and the signal cabling linking them together comprise an IA, allowing interconnection and functional integration of the MICAD-DC with ACADA, RADIAC, other existing and developmental NBC detectors, SINCGARS, CPE, M42 Alarm, M43A1 Detector, CVCI, GPS, Joint Warning and Reporting Network (OWARN), and NBC Analysis software.

**(3) Assembly Kit (A-kit).** The A-kit connects the core elements of the MICAD as an assembly and to a minimal number of associated command, control, communications and Intelligence (C4I) and NBC devices. The basic A-kit consists of the two IA cable sections linking a CIU and UIU to the DC, three drop cables for connection of devices to the UIUs, and a resistive terminator for the IA cable assembly. The composition of the A-kit cabling will vary by application and which vehicle platform the MICAD is mounted on.

**(4) Telemetry Link Radio (TLR).** The MICAD TLR will be employed in battlefield ground units for the transmission of NBC alarms and information from remote chemical detectors to the TLR-equipped MICAD core for processing into an NBC-1 report. It will also activate the user-selectable audio or vibratory warning function of the Personal Alarms (PAs) provided to individual soldiers.

**(5) Personal Alarm (PA).** These devices, essentially the equivalent of commercial pagers, will be issued to individuals for activation by the TLR in the event of an NBC event. They will provide area warning at the squad level.

**(6) Sample Transfer System (STS).** Internally mounted chemical agent detectors in vehicles, vans, and shelters will use the STS to sample internal and external air. This element of the MICAD has not been developed at this time and was not tested during the OT Phase 2.

d. The MICAD will be available as a complete system in which its basic constituent components will be augmented with an installation kit to suit the particular application. The basic MICAD configuration consists of one each DC, CIU, UIU and the A-kit, the latter with IA and drop cables customized for its intended application. It is not an end item itself, but forms the core of complete MICAD system configurations tailored with variable A-kit compositions, additional UIUs, drop and IA cables, and the application of an appropriate number of TLRs, PAs, binding post assemblies, mounting brackets, and an STS, in support of specific systems. The development of the STS has been deferred until after the completion of the base MICAD system.

e. The following is identified as the base MICAD system for test: DC, UIU, and CIU. The TLRs and pAs will be part of the installation kits for each type of vehicle as applicable and will be included in the test, but will not be supplied with each MICAD system. The development of the STS will be part of a Pre-Planned Product Improvement (p3I) program for the MICAD and will follow completion of the base MICAD system.

#### **Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- NBC- Detector- Sampler Kit M279

#### **Reference** (Chipman et al., 2002):

Chipman, M., Tackett, S., Fuller, J., Finanger, K., & Kocher, T. (2002). System Assessment (SA) for the Sampler Kit, Air: Chemical Agent Alarm, M279 Surface Sampler Probe: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB284168.

#### **Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

150603 - Chemical, Biological and Radiological Warfare

Descriptors:

(U) \*CHEMICAL AGENT DETECTORS, HAZARDS, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, SYSTEMS ANALYSIS, CONTAMINATION, SAMPLERS, CHEMICAL WARFARE AGENTS, KITS, WARNING SYSTEMS

Identifiers:

(U) M279 SAMPLER KITS

**System Description:**

Forces opposing the United States have a near all-weather ability to contaminate personnel, materiel, and terrain with chemical agents. To effectively counter this chemical agent threat, the U.S. Armed Forces require a man-portable, automatic chemical agent alarm system (currently the M22 Automatic Chemical Agent Alarm (ACADA)). In its chemical agent monitoring survey role, the system is required to determine if the area being monitored/surveyed is contaminated. Accordingly, the M279 Sampler Kit will be used as an auxiliary component to the M22 ACADA for the completion of this role. The M279 Sampler Kit shall be capable of transferring liquid deposits for vaporization and analysis. Support of the system will be supplied through the existing logistics system, and the system will be operable by any military occupational specialty (MOS) with minimal specific training.

b. The Surface Sampler Probe (SSP) will be an auxiliary component of the M22 ACADA. It is a Pre-Planned Product Improvement (P3I) program. The market survey conducted for the M22 ACADA program documented that if the M22 system was to be procured as a NonDevelopmental Item, the SSP would have to be procured separately. System requirements from the TEMP of the SSP and the ACADA Operational Requirements Document (ORD) include:

- Sampling various surfaces and terrain for deposited chemical liquids.
- Transference of the chemical to the M22.
- Providing all power, pneumatic, and interfacing hardware required for operation of the SSP.
- No degradation of performance of the M22.
- Capability of the system to operate in ambient atmosphere or inside Collective Protection Equipment (CPE) environments.
- Capability of the system to notify the operator of faults or operational status (built-in test).
- The system will require no unique training concepts, logistical support concepts, maintenance concepts, or any new MOS for operation.

c. The SSP is the major component of the M279. The SSP vaporizes the liquid from the surface by way of a heater located at the head of the probe that is covered by the disposable tip. The vapor condenses on the disposable tip of the SSP after the heater is turned off. The SSP is then presented over the detector adapter that is placed around the inlet of an operating M88 Detector. The heater is again turned on to revaporize the condensed liquid. The vapors are then drawn into the M88 for analysis. If the M88 alarms, the SSP is moved away from the M88 and placed in its clear-down mode. Clear-down mode uses the heater to vaporize any residual liquid on the head of the SSP. The SSP houses a microprocessor that controls the heater operation and informs the operator of the current mode by way of three light-emitting diodes (LEDs). An on/off switch and a Mode switch control its operation. At temperatures below 23°C, heating is required. The length of heating time during the sampling cycle is predetermined and controlled by the sensing devices and electronic circuitry contained within the probe handle.

d. Critical Interfaces. The SSP shall interface with the M22 ACADA. No other system is planned to interface with the SSP; however, it should be possible for other systems (i.e., Chemical Agent Monitor/improved Chemical Agent Monitor (CAM/ICAM) and Joint Chemical Agent Detector (JCAD)) to use the SSP.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- NBC- Gloves- JSLIST

**Reference** (Kocher et al., 2004):

Kocher, T., Kamenik, P., & Hernandez, J. (2004). System Evaluation Report (SER) for the Joint Service Lightweight Integrated Suit Technology (JSLIST) Block 1 Glove Upgrade / Abbreviated (ASER): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB296836.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

150603 - Chemical, Biological and Radiological Warfare

230400 - Protective Equipment

Descriptors:

(U) \*CHEMICAL WARFARE AGENTS, \*GLOVES, OPERATIONAL EFFECTIVENESS, HUMAN FACTORS ENGINEERING, JOINT MILITARY ACTIVITIES, LIGHTWEIGHT, MUSTARD AGENTS, PROTECTIVE CLOTHING, GB AGENT, GD AGENT, HAZARDOUS MATERIALS, PROTECTIVE COVERINGS

Identifiers:

(U) SER(SYSTEM EVALUATION REPORT), JSLIST(JOINT SERVICE LIGHTWEIGHT INTEGRATED SUIT TECHNOLOGY), CBRN(CHEMICAL BIOLOGICAL RADIOLOGICAL AND NUCLEAR)

**System Description:**

The JSLIST program (originating in 1993) developed an improved chemical protective overgarment wearable with standard masks, boots, and gloves in pending or imminent mission oriented protective posture (MOPP) level 4 conditions. The JSLIST Pre-Programmed Product Improvement (P31) program (1999-2000) investigated several glove technologies as replacement to standard 14-mil butyl chemical protective gloves (MIL-G-43976), but no candidates met user requirements for durability, chemical protection, and human factors. Following JSLIST P31, U.S. Special Operations Coinmand (SOCOM) elevated concerns that current 14-mil butyl gloves were unsuitable for mission use with JSLIST suits and could sacrifice mission performance effectiveness by Special Operations Forces (SOF). SOCOM identified a need to find a replacement glove with an improved design. The United States Marine Corps (USMC) - managed JSLIST Block 1 Glove Upgrade (JB 1GU) Program intends to fulfill as many military user requirements as possible, but emphasis has been directed to support the ground warrior and SOF operators as priority users. Any requirements not satisfied in the JSLIST Block 1 "interim" program will be sought for in the Block 2 full solution (JB2GU).

The JBIGU can be a liner worn with current military gloves [Type I], a glove worn in place of current gloves [Type II], or may be a combination of new glove and liner that together provide chemical protection! functionality of the glove(s) it replaces [Type III]. Type IIIA designates a butyl glove, and Type IIIB denotes a non-butyl glove. All gloves must be compatible with the JSLIST ensemble.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- NBC- Mask- Protective- Aircrew- ACPM M45

**Reference** (Johnson et al., 1999):

Johnson, L., Fendick, K., & Fuller, J. (1999). System Assessment (SA) for the M45 Aircrew Protective Mask (Acpm): U.S. Army Operational Test and Evaluation Command, Part Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB247450.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

150603 - Chemical, Biological and Radiological Warfare

Descriptors:

(U) \*PROTECTIVE MASKS, SURVIVABILITY, DECONTAMINATION, FLIGHT CREWS, PERFORMANCE(ENGINEERING), COMPATIBILITY, HUMAN FACTORS ENGINEERING, BIOLOGICAL WARFARE AGENTS, ACCEPTABILITY, CHEMICAL WARFARE AGENTS, RADIOLOGICAL WARFARE AGENTS

Identifiers:

(U) EXPORT CONTROL, M-45 PROTECTIVE MASK, ACPM(AIRCREW PROTECTIVE MASK)

**System Description:**

The M45 ACPM was developed as a replacement for current aviator masks. It will be used by all Army aircrew members except AH-64 (Apache) helicopter pilots in the conduct of aviation missions anywhere in chemical/biological (CB) environments. The M45 Mask consists of the following components: (a) close-fitting eye lenses, (b) front and side voice-mitter for face-to-face and telephone communication, (c) a microphone pass-through for aircraft communication, (d) a drink tube pass-through for liquid nutrients, (e) a low-profile canister interoperability hose assembly to allow both hose- and face-mounted configurations, (f) interchangeable nose cups, (g) a rubber facepiece with an in-turned peripheral seal, and (h) a second skin and hood. The mask is designed to provide the required CB protection without the aid of forced ventilation air while maintaining compatibility with aircraft sighting systems and night vision devices. Injection molded composite materials are used for the component parts to reduce weight and cost.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- NBC- Mask- Protective- JSCESM

**Reference** (Schmalkuche et al., 2006):

Schmalkuche, F., Deng, G., Merchant, F., Finanger, K., Fowlerberry, B., Kudrycki, K., Wetzel, R., Cunningham, D., Farmer, S., & Loeper, K. M. (2006). System Evaluation Report (SER) for the Joint Service Chemical Environment Survivability Mask (JSCESM): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 63599220. DTIC ADB323345.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

230600 - Escape, Rescue and Survival

150603 - Chemical, Biological and Radiological Warfare

Descriptors:

(U) \*ACCEPTANCE TESTS, \*PROTECTIVE MASKS, \*SURVIVAL EQUIPMENT, TEST AND EVALUATION, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, SYSTEMS ANALYSIS

Identifiers:

(U) \*BIOLOGICAL, CHEMICAL, OR NUCLEAR AGENTS, FRP(FULL-RATE PRODUCTION) DECISION

**System Description:**

The JSCESM is a commercial-off-the-shelf item designed to be a lightweight, low-bulk, short-duration protective mask/hood capable of providing the participant with above-the-neck, respiratory, and ocular protection against a low threat of chemical, biological and radioactive attack. The JSCESM is designed to protect against chemical vapors (other than gross contamination), fumes, and airborne biological and radiological particulate hazards. JSCESM will also be used in incident response roles and other similar situation where the general-purpose mask is unavailable, to provide emergency escape respiratory protection to Initial Response Force personnel and/or victims exposed to hazardous environment during incidents/evacuation operations. For direct threat conditions, standard mission-oriented protective posture

(MOPP) equipment (e.g., Joint Service General Purpose Mask, M40, M45, MCU-2IP) should be used. The JSCESM is designed to minimize weight and bulk while maximizing the wearer's performance and compatibility with service-protective equipment, communication systems, optical display, and sighting systems. The mask is one-size-fits-all, adult only, inexpensive, and disposable.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- NBC- Mask- Protective- JSGPM

**Reference** (Schmalkuche et al., 2007):

Schmalkuche, F., Merchant, F., Storey, S., Cowan, J., Fowler-Berry, B., Wetzell, R., Scott, D., McCulley, M. M., Cunningham, D., Brown, P., Gossage, A., & Rich, R. (2007). System Evaluation Report (SER) for the Joint Service General Purpose Mask (JSGPM): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 71949975. DTIC ADB329017.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

150603 - Chemical, Biological and Radiological Warfare

230400 - Protective Equipment

Descriptors:

(U) \*TEST AND EVALUATION, \*PROTECTIVE MASKS, SURVIVABILITY, TOXIC AGENTS, RADIOACTIVE MATERIALS, BIOLOGICAL WARFARE AGENTS, CHEMICAL WARFARE AGENTS

Identifiers:

(U) \*JSGPM(JOINT SERVICE GENERAL PURPOSE MASK), INDIVIDUAL PROTECTION, TIC(TOXIC INDUSTRIAL CHEMICALS), RADIOACTIVE PARTICLES, SUITABILITY

**System Description:**

The JSGPM is a lightweight, protective mask system in two versions: the XM 50 for ground and shipboard personnel and the XM 51 for armored vehicle crewman (consisting of mask, carrier and accessories). Both mask variants come with two carrying cases. One case is used for the mask and mask-related components; the other includes decontamination kits, secondary filters; clear, sunlight and laser outserts, Nerve Agent Antidote Kit (NAAK), or Antidote Treatment Nerve Agent Auto-Injector System. The JSGPM has a permanent clear lens. The JSGPM may be worn with a corrective lens insert (worn inside the JSGPM), and sunlight, or clear, or laser outsert lens (all optional) worn outside the JSGPM. The lens configuration and options for the XM50 and XM51 are the same. Warfighters will wear these protective masks based on threat, operational requirements, and mission profiles (to include training). The protective mask, together with other new and developmental personal protective equipment (e.g., Joint Service Lightweight Integrated Suit Technology [JSLIST]), will allow the Warfighters the flexibility to tailor their protection to the mission based on the threat.

The Primary Inventory Control Activity (PICA), a Department of Defense (DoD) organization, will stock the JSGPM in sufficient quantities for replacement when the mask is no longer serviceable, or can no longer provide the required levels of protection by maintenance or repair. Operator level maintenance will be minimal. All maintenance support will be based on individual Service support management concepts unless a joint concept (at one or more levels) is deemed more cost-effective and practical.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to

Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458:

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**System Short Name:** SER- NBC- Shelter- CBPS

**Reference** (Sigler et al., 2001):

Sigler, R., Simmons, D., Finanger, K., Fuller, J., Doan, H., Padgett, D., Hadden, R., Susman, C., Webster, C., & Epley, J. (2001). System Evaluation Report (SER) for the Chemical Biological Protective Shelter (CBPS): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 11888530 / 2001-LU-E/CS-1432A. DTIC ADB268519.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

230400 - Protective Equipment

Descriptors:

(U) \*COLLECTIVE PROTECTION, TEST AND EVALUATION, MOBILITY, SHELTERS, OPERATIONAL EFFECTIVENESS

Identifiers:

(U) LMS(LIGHTWEIGHT MULTIPURPOSE SHELTERS), PQT(PRODUCTION QUALIFICATION TEST), LUT&E(LIMITED USER TEST AND EVALUATION), CBPS(CONTROLLED COLLECTIVE PROTECTION SYSTEMS)

**System Description:**

The CBPS is a tactically mobile, quickly erected, environmentally controlled, collective protection system that provides an operating area for medical personnel to execute their mission without having to wear individual protective clothing and equipment. The CBPS is an integrated, self-contained system consisting of three major subcomponents:

- 1) a Lightweight Multipurpose Shelter (LMS) and a (M1113) High Mobility Multipurpose Wheeled Vehicle (HMMWV) Expanded Capacity Vehicle (ECV);
- 2) an attached 300-square-foot, air beam supported, chemically resistant soft shelter;
- 3) and a High Mobility Trailer (HMT), with a 10,000 kilowatt (10kW) Tactical Quiet Generator (TQG) for auxiliary power.

The ECV engine drives a hydraulic motor providing primary systems power for full operational capabilities and an Environmental Support System (ESS). The TQG functions as an auxiliary power source, providing electrical power medical mission equipment, and providing auxiliary power for NBC mode operations. The ECV variant has a turbo-charged engine with additional suspension support for extra weight capacity and an improved braking system. The HMT is towed by the prime mover. The crew and additional medical equipment are carried inside the ECV. The CBPS provides a contamination free, controlled working environment for:

- a. Treatment squads of the division Forward Support Battalion and Main Support Battalion (FSBIMSB).
- b. Treatment squad of maneuver battalions.
- c. Treatment squad of the medical treatment company (non-divisional).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- NBC- Shelter- CBPS-DCS/FST

**Reference** (Sigler et al., 2002):

Sigler, R., Webster, C., Finanger, K., Fuller, J., Layman, M., Doan, H., Padgett, D., Hadden, R., Epley, J., Miller, C., & Gent, R. (2002). System Evaluation Report (SER) for the Chemical Biological Protective Shelter (CBPS) Division Clearing Station/Forward Surgical Team (DCS/FST): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB284962.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

150603 - Chemical, Biological and Radiological Warfare

Descriptors:

(U) \*SHELTERS, \*BIOLOGICAL WARFARE AGENTS, \*CHEMICAL WARFARE AGENTS, \*COLLECTIVE PROTECTION, DECISION MAKING, SURVIVABILITY, OPERATIONAL READINESS, SYSTEMS ANALYSIS

Identifiers:

(U) EXPORT CONTROL, CBPS(CHEMICAL BIOLOGICAL PROTECTIVE SHELTER)

**System Description:**

The CBPS is a tactically mobile, quickly erectable, environmentally controlled, collective protection system. In addition, the CBPS is an integrated, self-contained system consisting of the four following major subcomponents.

- A Lightweight Multipurpose Shelter (LMS);
- A (M1113) High Mobility Multipurpose Wheeled Vehicle (HMMWV) Expanded Capacity Vehicle (ECV);
- An attached 300-square-foot, chemically resistant, air-beam shelter (ABS); and
- A High Mobility Trailer (HMT) with a 10-kW Tactical Quiet Generator (TQG) for auxiliary power.

The ECV engine drives a hydraulic motor providing primary systems power for full operational capabilities and an Environmental Support System (ESS). The TQG functions as an auxiliary power source to provide back-up power for the ECV to maintain the NBC mode of operation and CBPS lighting system in the event of ECV malfunction or refueling. The TQG is not intended to support either the ESS operations (e.g., environmental control unit, heaters, ... ) or medical equipment (the medical equipment has its own organic power supplies.) The ECV variant has a turbo-charged engine with additional suspension support for extra weight capacity and an improved braking system. The HMT will be towed by the prime mover and will be used to transport the crew's gear, additional medical supplies, and limited equipment. The system provides an operating area for medical personnel to execute their mission without having to wear individual protective clothing and equipment. To form a DCS, four CBPS are inflated and assembled one to another, a process called complexing. To form an FST, three CBPS are complexed. To create a DCS/FST, seven CBPS are complexed. The CBPS provides a contamination-free, temperature-controlled working environment for:

- a. Treatment squads of the division Forward Support Battalion and Main Support Battalion (FSB/MSB).
- b. Treatment squad of maneuver battalions.
- c. Treatment squad of the medical treatment company (non-divisional).
- d. Division Clearing Stations (DCS).
- e. Forward Surgical Teams (FST).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- NBC- Suit- Glove- JSLIST

**Reference** (Schmalkuche et al., 2007):

Schmalkuche, F., Bedard, C., Fraker, C., Cowan, J., Westerfield, T., Fowler-Berry, B., Khan, A., Cunningham, D., Wollenberg, L., Schmalkuche, F., Townsend, D., Gossage, A., Doyle, T., Bryan, E., & Bransdorfer, A. (2007). System Evaluation Report (SER) for the Joint Service Lightweight Integrated Suit

Technology (JSLIST) Block 2 Glove Upgrade (JB2GU) Non-Flame Resistant (NFR) Variant: U.S. Army  
Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA  
22302-1458. DTIC ADB330930.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

150603 - Chemical, Biological and Radiological Warfare

230400 - Protective Equipment

Descriptors:

(U) \*OPERATIONAL EFFECTIVENESS, \*GLOVES, BIOLOGICAL WARFARE AGENTS, CHEMICAL  
WARFARE AGENTS

Identifiers:

(U) \*SUITABILITY, \*JB2GU(JSLIST BLOCK 2 GLOVE UPGRADE), \*CB PROTECTIVE GLOVES,  
JSLIST(JOINT SERVICE LIGHTWEIGHT INTEGRATED SUIT TECHNOLOGY), CB(CHEMICAL  
BIOLOGICAL)

**System Description:**

The JB2GU is the second increment in an evolutionary Acquisition Category (ACAT) III program that provides 24 hours of CB protection to the hand and wrist from battlefield concentrations of all known military CB agents for up to 30 days of wear. Aircrews and CVC wear the JB2GU FR with the JPACE and all other military personnel wear the JB2GU NFR with the JSLIST (the scope of this SER is limited to the NFR variant). The JB2GU permits the Warfighter to perform a full range of missions in CB environments worldwide while meeting all Joint Service requirements for a CB protective glove. The JB2GU NFR is intended for use by Warfighters who are not subject to a threat of fire.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- NBC- Suit- ITAP

**Reference** (Beran et al., 1999):

Beran, G., Fuller, J., Dunn, N., Hannah, L., & Chan, A. (1999). System Evaluation Report (SER) for the Improved Toxicological Agent Protective (ITAP) Ensemble: U.S. Army Evaluation Center (AEC), Aberdeen Proving Ground, MD. Report #: 92168110. DTIC ADB245023.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

061100 - Toxicology

230400 - Protective Equipment

230500 - Life Support Systems

Descriptors:

(U) \*TOXIC AGENTS, \*PROTECTIVE EQUIPMENT, \*RESPIRATORY SYSTEM, \*SYSTEMS ANALYSIS,  
\*BREATHING APPARATUS, EMERGENCIES, DECISION MAKING, SUPPLY DEPOTS, SELF  
CONTAINED, CLASSIFICATION, CLOTHING, MOTORS, COMPRESSED AIR, GLOVES, SPLASH, AIR  
SUPPLIES, BLOWERS, BUTYL RUBBER, LIFE SAVING

Identifiers:

(U) ITAP(IMPROVED TOXICOLOGICAL AGENT PROTECTIVE), IDLH(IMMEDIATELY DANGEROUS  
TO LIFE AND HEALTH), PICS(PERSONAL ICE COOLING SYSTEM), CASS(COMPACT AIR SUPPLY  
SYSTEM), M40 MASK

**System Description:**

The ITAP ensemble is designed to provide protection for personnel working near toxic chemical warfare (CW) agent stockpiles, performing routine depot operations, initial entry tasks, technical escort incident response, or emergency life-saving response tasks requiring working in toxic, unknown, or oxygen-deficient environments that could rapidly degrade into conditions immediately dangerous to life and health (IDLH). The ITAP ensemble is intended to be worn in two respiratory protective modes, using either filtered air with a compact air supply system (CASS), or with a compressed-air self-contained breathing apparatus (SCBA). The ITAP with CASS or the ITAP with SCBA consists of the following components:

**a. ITAP Suit.** The protective suit is a one-piece garment with integral hood and booties and provisions for attaching standard butyl gloves, and is designed to remain serviceable for two hour missions. The suit is constructed from laminated materials impervious to CW agents; standard military decontaminates; petroleum, oil, and lubricants (POL) products; and industrial chemicals. The suit is available in four sizes (small, medium, large, and extra large) to fit the 5th percentile female through the 95th percentile male. The suit is donned via a belly button-to-neck opening having both splash-proof zipper and button snap closures [around neck] to maintain protective integrity.

**b. Overvest and Hood.** The over vest and splash hood are constructed of a flame-resistant poly cotton/film laminate. The splash hood is provided for extra protection to the head area, and the splash overvest is used to provide chemical splash protection for the compressed-air bottle, harness, regulator, gage and tubing of the SCBA, and the pump motor housing of the Personal Ice Cooling System (PICS) worn outside the suit.

**c. SCBA.** The SCBA w/CW Kit is a positive-pressure respiratory device using compressed air complying with the Compressed Gas Association Specification G-7-1 for type D air in a 4500 psi cylinder carried on the back. This 60-minute duration (nominal) cylinder connects via high pressure hoses to a secondary pressure regulator reducing pressure to 110 psi for supply to the positive pressure-demand breathing valve attached to the facepiece which releases air upon inhalation. The positive pressure mode is automatically activated once the user starts breathing with the mask and is designed to keep toxic gases from leaking into the facepiece. The exhaled air is vented into the hood to reduce the exposure of the SCBA components. When cylinder air is consumed, the CW Kit attached to the mask allows the user to breathe air filtered through a C2 canister.

**d. CASS.** The CASS is a small, lightweight, dual-C2-canister unit providing a continuous flow of clean, filtered air for breathing. The CASS is designed for use on standard nuclear, biological, and chemical (NBC) respiratory protection apparatus (i.e., M40 Mask). The Chemical and Biological Defense Command (CBDCOM) is developing the CASS using the lightweight motor blower used with M48 CB Apache Aviator and M49 CB General Aviator masks. As in the SCBA mode of respiration, the CASS mode will supply filtered air to reduce the risk of agent exposure by maintaining positive pressure and airflow during respiration.

**e. PICS.** The PICS is an ice-based liquid cooling system powered by three D-cell batteries. The PICS is composed of a pump motor housing/battery unit, tether line, insulated ice bag, ice bottle, and liquid cooling shirt (sizes S, M, L, and XL). The PICS supplies, on average, 150 watts of cooling to the user for 1 hour at 80 degrees Fahrenheit (OF) without an ice bottle replacement. The PICS ice bottle is designed to be operator replaceable in a contaminated environment. Ice bottle life is dependent on ambient temperature and user metabolic rate; however, ice bottle changeouts will occur approximately every 30 minutes throughout the 1-hour SCBA mission or 2-hour CASS mission.

**f. Other Components.** The ITAP ensemble will also use the following components from the M3 Toxic Agent Protective (TAP) ensemble: M3 TAP Gloves, TAP Boots, and M40 mask.

#### **Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- NBC- Suit- JSLIST-I

**Reference** (Musgrave et al., 1997):

Musgrave, D., Dunn, N., Gasiorowski, F., Winters, J., & Tackett, S. (1997). System Evaluation Report (SER) for the Joint Service Lightweight Integrated Suit Technology I (JSLIST I), Developmental and

Operational Tests (DTs and OTs): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA DTIC ADB223903.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

150603 - Chemical, Biological and Radiological Warfare

230400 - Protective Equipment

Descriptors:

(U) \*BIOLOGICAL AGENTS, \*CLOTHING, \*PROTECTIVE MASKS, TEST AND EVALUATION, AEROSOLS, DECISION MAKING, PRODUCTION, VAPORS, MISSIONS, SYSTEMS ANALYSIS, ARMY AVIATION, GLOVES, JOINT TEST AND EVALUATION

Identifiers:

(U) JSLIST (JOINT SERVICE LIGHTWEIGHT INTEGRATED SUIT TECHNOLOGY), SER(SYSTEM EVALUATION REPORT)

**System Description:**

The JSLIST I program components are designed to provide individuals protection against liquid, vapor, aerosol chemical, and biological agents, and alpha and beta radioactive dust particles by encapsulating users in a protective ensemble. The ensemble consists of a penneable, two-piece gannent with an integral hood (except for the Army Aviation gannent which has no hood), gloves, and boots. The ensemble must be suitable for individuals to wear while performing mission-essential tasks. When ensembles are worn with the appropriate protective mask, they will provide protection to all areas of the body while users are performing mission activities. The gannents are launderable by field methods and can be worn for at least 30 days. The gloves and boots are not launderable and can be worn for 30 and 60 days, respectively. The Army also has a requirement for the Lightweight Chemical/Biological (CB) Protective Gannent (LCBPG) which can be worn for at least 7 days and is not required to be launderable. (1) The following standard gannents, boots, and gloves were used as control items for testing during DT and OT:

- Battledress Overgannent (BDO)
- Saratoga Chemical Suit (SAR)
- Chemical Protective Overgannent (CPO)
- Chemical Protective Undergannent (CPU)
- Black Vinyl Overboot/Green Vinyl Overboot (BVO/GVO)
- Butyl Rubber Gloves (Butyl)

(2) The following JSLIST I candidate garments, boots, and gloves were tested during the DT and OT:

- Five Advanced Battledress Overgannents--two are flame resistant (OFRI and OFR2), and three are nonflame resistant (ONFRI, ONFR2 and ONFR3)
- Five Duty Uniforms--two are flame resistant (DFRI and DFR2) and three are nonflame resistant (DNFRI, DNFR2 and DNFR3)
- Two Aviation Overgannents--both are flame resistant (AFRI and AFR2)
- One Undergannent--Vapor Protective Flame Resistant Undergannent (VPFRU)
- Two prototype gloves--Improved Chemical/Biological Gloves (ICBG A and ICBG B)
- One prototype overboot--Multipurpose Overboot (MULO)

The ensemble is required to be compatible with all currently used personal protective equipment and individual clothing items to include, but not limited to, the M17A2, M25A1, M40A1I2, and MCU-2/P protective masks (both with and without second skins), chemical protective gloves, duty uniforms, load-bearing equipment (LBE), helmets, chemical protective boots, and cold/wet weather gear.

The Army has an additional requirement for garments to be compatible with the M42, M43, and XM45 protective masks, with second skins, and other protective mask systems currently under development. Redesigned JSLIST garments were tested in the LUT to evaluate durability and MANPRINT. The following design changes were made to the JSLIST overgarments and duty uniform:

- Reduced hook tape at the neck from 2 to 1.5 inches
- Eliminated all 2-inch hook and pile tape and replaced with 1.5-inch
- Reshaped neck opening
- Added zipper thong, lengthened crotch cord 3 inches, added three grommets for crotch cord
- Eliminated sleeve tab, eliminated upper right sleeve pocket and reinforcement

- Eliminated front inner zipper flap and eliminated waist adjustment covers
- Standardized sleeve pocket closure and eliminated flame resistant (FR) thread from FR configurations

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- NBC- Suit- STEPO

**Reference** (Smyers et al., 1997):

Smyers, P., Fuller, J., Finanger, K., Maxey, G., Hannah, T., & Barrett, C. (1997). System Evaluation Report (SER) for the Self-Contained Toxic Environment Protective Outfit (STEPO) (Type Classification - Standard Decision): U.S. Army Evaluation Analysis Center (EAC)., ATTN: CSTE-EAC-AV/CS, Aberdeen Proving Ground, MD 21005-3013. DTIC ADB229066.

**Key Words:**

\*chemical contamination, \*protective clothing, test and evaluation, industries, environments, decision making, toxic hazards, chemicals, penetration, self contained, classification, hazardous materials, wear resistance, gloves, tethering, exposure suits  
stepo(self-contained toxic environment protective outfit), chemical protection system, tap(toxicological agent protective), tethered operations, mist(man in simulat tests), industrial chemicals, environmental performance, type classification, standard decision

**Fields and Groups:**

230400 - Protective Equipment

**Descriptors:**

(U) \*CHEMICAL CONTAMINATION, \*PROTECTIVE CLOTHING, TEST AND EVALUATION, INDUSTRIES, ENVIRONMENTS, DECISION MAKING, TOXIC HAZARDS, CHEMICALS, PENETRATION, SELF CONTAINED, CLASSIFICATION, HAZARDOUS MATERIALS, WEAR RESISTANCE, GLOVES, TETHERING, EXPOSURE SUITS

**Identifiers:**

(U) STEPO(SELF-CONTAINED TOXIC ENVIRONMENT PROTECTIVE OUTFIT), CHEMICAL PROTECTION SYSTEM, TAP(TOXICOLOGICAL AGENT PROTECTIVE), TETHERED OPERATIONS, MIST(MAN IN SIMULANT TESTS), INDUSTRIAL CHEMICALS, ENVIRONMENTAL PERFORMANCE, TYPE CLASSIFICATION, STANDARD DECISION

**System Description:**

The STEPO, a Level A chemical protection system, consists of a totally encapsulating suit with gloves and booties, the standard Toxicological Agent Protective (TAP) boot, fresh-air breathing systems for both self-contained and tethered operations, a cooling system, and a communications system.

**Suit and Gloves.** The suit is a one-piece garment with integral booties, airtight slide fastener closure, and glove assembly. The suit fabric is made of five alternating layers of Nomex® and Tetlon® called Challenge 6400™, the same fabric used in the Improved Toxicological Agent Protective (ITAP) ensemble. The gloves are made of neoprene/butyl. An optional glove liner (Silvershield™) can also be worn.

**Breathing Equipment.**

a. B-SCBA, ak.a "Rebreather." For self-contained operations, a closed-circuit rebreather system is worn underneath the STEPO suit. The B-SCBA circulates exhaled air through a carbon dioxide scrubber which is then mixed with oxygen (O<sub>2</sub>) from a compressed O<sub>2</sub> bottle and reintroduced into the respirator facepiece where it is inhaled. This B-SCBA is designed to provide a 4-hour breathable air/oxygen mixture. It weighs approximately 35 pounds with its air supply.

b. Interspiro™ Self-Contained Breathing Apparatus (I-SCBA). The I-SCBA has been approved by the National Institute of Occupational Safety and Health (NIOSH) and is the Air Force Fire Fighter SCBA. It consists of a 6Q-minute (nominal) air cylinder with harness (shoulder and waist belts), pressure reduction

valve, breathing regulator, a pressure gauge, and connective hoses. The I-SCBA is worn under the STEPO suit and weighs approximately 35 pounds. It will be used as an alternative to the B-SCBA when a 1-hour air supply is sufficient.

c. Tether with Interspiro Emergency Breathing Apparatus (I-EBA). The tether configuration uses up to 300 feet of umbilical hose and an external air source to supply breathing air. The umbilical hose enters the suit at the waist pass-through. The I-SCBA with a 30-minute bottle, auto shut-off valve, and suit pass-through will be the emergency breathing apparatus (BBA).

**Communication Equipment.** The communications system is configured to interface with three different radio systems that are presently used by the Army (pRC-127, Motorola Saber, and GE MPD). Equipment which will be part of the STEPO system includes a voice-operated transmission (VOX) control unit, a microphone/speaker unit (may be either an ear microphone or chin microphone), and radio adapter cables for each radio type.

**Personal Ice Cooling System (PICS).** The PICS will be used in lieu of the microclimate cooling system (MCCS). The PICS consists of a battery-powered pump unit, plastic ice bottle, connective hoses, a suit pass-through, and a shirt with tubing running throughout. Ice is used as the cooling material and water is circulated through the tubing. The ice bottle provides approximately 30 minutes of cooling, depending on the air temperature and the user's energy expenditure before bottle replacement is required (eight replacements per 4-hour mission).

**STEPO Configurations.** There are three configurations in which the STEPO system can be worn. The STEPO system will be utilized by Army EOD teams, Army TEUs, and depot chemical munitions handlers. The EOD community will use the STEPO in the self-contained configuration only (i.e., no tethered operations). The TED and depot communities plan to use both the self-contained and tethered configurations depending on the location and nature of their operations.

#### **Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- NBC- Suit- STEPO

#### **Reference** (Beran et al., 2001):

Beran, G., Smyers, P., Chipman, M., & Fuller, J. (2001). System Assessment (SA) for the Self-Contained Toxic Environment Protective Outfit (STEPO): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. AEC, APG, MD. Report #: 11558488.

#### **Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

From DTIC ADB229066

230400 - Protective Equipment

Descriptors:

(U) \*CHEMICAL CONTAMINATION, \*PROTECTIVE CLOTHING, TEST AND EVALUATION, INDUSTRIES, ENVIRONMENTS, DECISION MAKING, TOXIC HAZARDS, CHEMICALS, PENETRATION, SELF CONTAINED, CLASSIFICATION, HAZARDOUS MATERIALS, WEAR RESISTANCE, GLOVES, TETHERING, EXPOSURE SUITS

Identifiers:

(U) STEPO(SELF-CONTAINED TOXIC ENVIRONMENT PROTECTIVE OUTFIT), CHEMICAL PROTECTION SYSTEM, TAP(TOXICOLOGICAL AGENT PROTECTIVE), TETHERED OPERATIONS, MIST(MAN IN SIMULANT TESTS), INDUSTRIAL CHEMICALS, ENVIRONMENTAL PERFORMANCE, TYPE CLASSIFICATION, STANDARD DECISION

#### **System Description:**

The STEPO, a Level A chemical protection system, consists of a totally encapsulating suit with gloves and booties, the standard Toxicological Agent Protective (TAP) boot, fresh-air breathing systems for both self-contained and tethered operations, a cooling system, and a communications system.

**Suit and Gloves.** The suit is a one-piece garment with integral booties, airtight slide fastener closure, and glove assembly. The suit fabric is made of five alternating layers of Nomex® and Tetlon® called Challenge 6400™, the same fabric used in the Improved Toxicological Agent Protective (ITAP) ensemble. The gloves are made of neoprene/butyl. An optional glove liner (Silvershield™) can also be worn.

**Breathing Equipment.**

a. B-SCBA, aka "Rebreather." For self-contained operations, a closed-circuit rebreather system is worn underneath the STEPO suit. The B-SCBA circulates exhaled air through a carbon dioxide scrubber which is then mixed with oxygen (O<sub>2</sub>) from a compressed O<sub>2</sub> bottle and reintroduced into the respirator facepiece where it is inhaled. This B-SCBA is designed to provide a 4-hour breathable air/oxygen mixture. It weighs approximately 35 pounds with its air supply.

b. Interspiro™ Self-Contained Breathing Apparatus (I-SCBA). The I-SCBA has been approved by the National Institute of Occupational Safety and Health (NIOSH) and is the Air Force Fire Fighter SCBA. It consists of a 6Q-minute (nominal) air cylinder with harness (shoulder and waist belts), pressure reduction valve, breathing regulator, a pressure gauge, and connective hoses. The I-SCBA is worn under the STEPO suit and weighs approximately 35 pounds. It will be used as an alternative to the B-SCBA when a 1-hour air supply is sufficient.

c. Tether with Interspiro Emergency Breathing Apparatus (I-EBA). The tether configuration uses up to 300 feet of umbilical hose and an external air source to supply breathing air. The umbilical hose enters the suit at the waist pass-through. The I-SCBA with a 30-minute bottle, auto shut-off valve, and suit pass-through will be the emergency breathing apparatus (BBA).

**Communication Equipment.** The communications system is configured to interface with three different radio systems that are presently used by the Army (pRC-127, Motorola Saber, and GE MPD). Equipment which will be part of the STEPO system includes a voice-operated transmission (VOX) control unit, a microphone/speaker unit (may be either an ear microphone or chin microphone), and radio adapter cables for each radio type.

**Personal Ice Cooling System (PICS).** The PICS will be used in lieu of the microclimate cooling system (MCCS). The PICS consists of a battery-powered pump unit, plastic ice bottle, connective hoses, a suit pass-through, and a shirt with tubing running throughout. Ice is used as the cooling material and water is circulated through the tubing. The ice bottle provides approximately 30 minutes of cooling, depending on the air temperature and the user's energy expenditure before bottle replacement is required (eight replacements per 4-hour mission).

**STEPO Configurations.** There are three configurations in which the STEPO system can be worn. The STEPO system will be utilized by Army EOD teams, Army TEUs, and depot chemical munitions handlers. The EOD community will use the STEPO in the self-contained configuration only (i.e., no tethered operations). The TED and depot communities plan to use both the self-contained and tethered configurations depending on the location and nature of their operations.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- NLCS

**Reference** (Smyers et al., 2006):

Smyers, P., Blankenship, C., & Leadore, G. (2006). System Evaluation Report (SER) for the Type Classification - Standard and Full Material Release Decisions for the Platoon Non-Lethal Capabilities Set (NLCS): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 61389130. DTIC ADB320099.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

**Fields and Groups:**

230400 - Protective Equipment

**Descriptors:**

(U) \*PROTECTIVE EQUIPMENT, TEST AND EVALUATION, ACQUISITION, SURVIVABILITY, TRAINING DEVICES, SHIELDING, MODIFICATION, OPERATIONAL EFFECTIVENESS, SAFETY

**Identifiers:**

(U) \*RCA(RIOT CONTROL AGENTS), NLCS(NON-LETHAL CAPABILITIES SET)

**System Description:**

The NLCS consists of protective individual equipment, counter-personnel and counter-materiel items, and enhancement devices used in conducting crowd-control operations. The items have been type-classified or tested and approved as part of their individual acquisition program evaluations. The classes of items range from protective devices such as face or body shields and shin guards to bullhorns, ammunition pouches, and training equipment.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- OSCILLOSCOPE (OS-303)

**Reference** (Lee et al., 2001):

Lee, I., Flory, T., & Matthews, S. (2001). System Evaluation Report (SER) for the Oscilloscope (OS-303()/G), MS I/III: U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB264877.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

**Fields and Groups:**

090100 - Electrical and Electronic Equipment

140200 - Test Facilities, Equipment and Methods

**Descriptors:**

(U) \*ELECTRONIC EQUIPMENT, \*OSCILLOSCOPES, WEAPON SYSTEMS, COMMUNICATION EQUIPMENT, TEST EQUIPMENT, MAINTAINABILITY, REPAIR

**Identifiers:**

(U) OS-303()/G OSCILLOSCOPES

**System Description:**

The OS-303( )/G is required for support of both analog and digital systems and it supports Army Universal Task List (AUTL) task 4.0 (CSS and Sustainment by directly supporting AUTL 4.2.3 (Diagnose Equipment Faults). It will be used to display complex waveform measurements of communications-electronics (C-E), missile, aviation, computer, land combat, and automatic/general purpose test equipment. It will, also be used as an analysis tool for C-E surveillance operations. The oscilloscope will be assigned to units that have responsibility for tactical, sustainment, or strategic maintenance. The system is a commercial off-the-shelf (COTS) item. It must have the capability to support both fixed and tactical units. The Ordnance Corps, Army Signal Command, Information Systems Command, and Military Intelligence will be the primary users of the OS-303( )/G.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

**System Short Name:** SER- Parachute- ATPS

**Reference** (Pericles et al., 2009):

Pericles, J. S., Lewis, J. W., Spencer, R. A., Earl, B., Dimpfel, F., Hretz, J., Addison, C., Kalinov, J., Tladen, R., Allen, K., & Manke, R. (2009). Operational Test Agency Evaluation Report (OER) for the Advanced Tactical Parachute System (ATPS) Milestone C - Type Classification U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. DTIC ADB347017.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER, System Assessment (SA),  
Fields and Groups:

010308 - Gliders and Parachutes

010200 - Military Aircraft Operations

Descriptors:

(U) \*TEST AND EVALUATION, \*PARACHUTES, PARACHUTE JUMPING, PARACHUTE DESCENTS,  
OPERATIONAL EFFECTIVENESS, RELIABILITY

Identifiers:

(U) \*ATPS(ADVANCED TACTICAL PARACHUTE SYSTEM), \*T-11 PARACHUTES, T-11 ATPS, RATE  
OF DESCENT, OPERATIONAL SUITABILITY, INJURY RATE

**System Description:**

The T-11 ATPS is a troop personnel parachute system consisting of main parachute, reserve parachute, and harness. Throughout this document, ATPS refers to the T-11 ATPS.

**Main Parachute System.** The T-11 ATPS main parachute serves as the functional component used to safely deliver the paratrooper to the ground during combat and training airborne operations. The T-11 ATPS main parachute consists of a deployment bag, static line, pilot chute, canopy sleeve, suspension lines, risers, slider, and canopy releases for connection to the troop harness. The main parachute is a non-maneuverable canopy with slip-assist capabilities for avoiding obstacles.

**Reserve Parachute System.** The T-11 ATPS reserve parachute is intended for emergency use during airborne operations in the event of a main parachute malfunction. It also contains a pilot chute, suspension lines, risers, attachment devices for connection to the troop harness, a chest mounted reserve, and an activation handle. A deployment device (kicker spring) provides positive deployment of a pilot parachute, thereby preventing entanglement of the reserve with the malfunctioning or fully functioning main parachute. The reserve parachute will function across a wide range of main parachute malfunctions, from jumper freefall in the event of no main parachute deployment, to the case of a fully inflated non-malfunctioning main parachute. (Note: In the case of a fully deployed main parachute without combat equipment, the reserve may not inflate.)

**Troop Harness.** The harness is a device that interfaces between the parachutist, the main and reserve parachute canopies, and the jumper's equipment. The harness is worn by the parachutist, and the parachutes and equipment are affixed to the harness. The harness is designed to fit the 5th percentile female through the 95th percentile (97th objective) male Soldier. It will permit Soldiers the mobility needed to run. The main canopy is mounted on the back and the reserve is mounted on the front. The harness has shoulder mounted riser attachment points for interfacing with the ATPS main parachute and chest mounted riser attachment points for the reserve parachute. There are two integral main parachute riser release devices for separation of the main parachute after landing. The harness also has equipment attachment points capable of integrating with all current equipment and weapons container systems certified for airborne operations. The harness has the capability of rapid doffing after landing on the ground or in water. The harness incorporates separate attachment points on either side for an equipment lowering line.

**Interfaces.** All ATPS components fully integrate into a complete recovery system. The ATPS harness interfaces with all currently certified equipment and weapons containers used during airborne operations, such as the Ail-Purpose Weapons Container, Parachutists Individual Equipment Rapid Release, Harness Single Point Release, M1950 Weapons Container, AT4 Jump Pack, etc. ATPS is not compatible with the T-10 parachute system or harness. The ATPS harness is compatible with a 5th percentile female through a 95th percentile male (97th objective) Soldier, and is capable of being worn with currently fielded

extreme cold weather gear, with the exception that intermediate cold weather gloves are worn, in lieu of the Arctic Mittens. The harness has lowering line anchor points to interface with the equipment lowering line snap hook. The main parachute has a static line deployment system that allows it to interface with USAF delivery aircraft.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Parachute- USL

**Reference** (Prather et al., 1998):

Prather, M., Fujiwara, M., & Finkel, M. (1998). System Assessment (SA) for the Universal Static Line (USL): U.S. Army Evaluation Analysis Center., Aberdeen Proving Ground, MD 21005-3013. DTIC ADB240147.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

010308 - Gliders and Parachutes

Descriptors:

(U) \*PARACHUTE JUMPING, \*RIPCORDS, OPERATIONAL EFFECTIVENESS, AIR DROP OPERATIONS, SYSTEM SAFETY

Identifiers:

(U) \*STATIC LINES, \*20 FOOT STATIC LINES, \*USL(UNIVERSAL STATIC LINE), C-130 AIRCRAFT, C-141 AIRCRAFT, AIRBORNE PERSONNEL, PERSONNEL AIR DROP

**System Description:**

The USL will be a single system intended to replace all current static lines on all T-10 and MC1-1 parachute systems. It will be certifiable on all US Army, US Air Force (USAF), US Navy, and US Marine Corps aircraft currently used for static line operations. Following is a brief discussion of the function of the static line and description of the USL options.

**1 The D-bag and static line assemblies** are a component of both the T-10 and MC1-1 series of troop parachute systems. The current D-bag and static line are connected to form a single assembly. The standard static line itself is 15 feet long. The parachute canopy is packed in the D-bag. The parachute canopy and D-bag are contained within the Pack Tray Assembly, which is attached to the parachute harness and located on the back of the parachutist. The static line is stowed on the outside of the pack tray. The other end of the static line terminates with a snap hook. The snap hook connects the static line and D-bag to the aircraft.

**2 There are two basic USL options:**

**a. Fixed-Length:** a single fixed-length static line which will work on all aircraft. A 20-foot length was chosen based on a number of factors, a significant one being that this length has been shown to work with the C-17 aircraft. Because of the similarity of this static line and the current one, this was the preferred approach. The main issue with this option is the potential for changing parachute operation. Therefore, each individual aircraft will be requalified with the 20-foot static line length.

**b. Convertible-Length:** a static line which can be changed or converted from one length to the other length, also called a convertible or "alternative USL" (an alternative to the 20-foot static line). This option has a disadvantage over the single-fixed-length option because it will result in a static line which is likely to be more complex than the current static line. However, the static line length for a given aircraft remains the same, which greatly reduces test requirements (since parachute operation is not an issue) and reduces the risk that the static line will not be compatible with a given aircraft. Currently, there are two convertible USL options: an adjustable length static line, which can be adjusted from one length to another by use of an adjuster bar located just below the static line snap hook, and a quick-change static line, where a static line segment of 11 or 16 feet is girth-hitched to a standard D-bag with a 4-foot static

line segment. The connection point is outside the parachute pack tray, allowing the static line length of a packed parachute to be changed.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- PFED

**Reference** (Boutin et al., 2004):

Boutin, M., Omole, A., Rambo, P., Barker, D., Zirhut, M., Hubner, M., Butler, T., & Good, B. (2004). System Assessment (SA) for the Pocket-Sized Forward Entry Device (PFED): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB300130.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

120500 - Computer Programming and Software

120600 - Computer Hardware

Descriptors:

(U) \*COMPUTER PROGRAMS, \*FIRE SUPPORT, \*TACTICAL DATA SYSTEMS, MILITARY FORCES(UNITED STATES), DECISION MAKING, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, SYSTEMS ANALYSIS, HAND HELD, FORWARD OBSERVERS

Identifiers:

(U) PFED(POCKET-SIZED FORWARD ENTRY DEVICE)

**System Description:**

The PFED hardware is a ruggedized commercial off-the-shelf personal digital assistant equipped computer with case. The PFED software runs on Microsoft Pocket Personal Computer or equivalent operating system. The PFED application is designed to provide a subset of the Forward Entry Device (FED) fire support team (FIST) functions with the ability to generate, transmit, process and display Army package 11 Variable Message Formats using the Military Standard (MIL-STD) 188-220 or the Tactical Fire Direction System (TACFIRE) frequency shift keying (FSK) protocol. The PFED uses secure or non-secure communications equipment to interface with the FIST system and other command and control (C2) systems.

**Interfaces and Inter-operability.** The PFED is designed to interface with the SingleChannel Ground and Airborne Radio System Advanced System Improvement Program (SINCGARS ASIP) combat net radio and the precision lightweight global positioning system (GPS) receiver (pLGR) or embedded GPS receiver. The PFED must also inter-operate with the Field Artillery Tactical Data System (AFATDS) through the handheld terminal unit (HTU) and laser devices such as the digital mini eye-safe laser infrared observation set (MELIOS), the Leica Vector, and other laser direction range finding binoculars.

**Background.** As part of the AFATDS program, the PFED is a project to leverage existing commercial-based handheld information technologies to improve the portability and increase the efficiency of dismounted tactical data systems currently in-use by the FOs and the FISTs. The PFED is designed to allow the FO to communicate digitally with the company fire support officer (PSO) over the radio frequency lower tactical internet as an FOS device. The FSO uses an HTU-FED configured in FSO mode or equivalent system. Once the message is received by the FSO, the messages are routed to the battalion (BN) fire support element (FSE). The BN FSE then routes the messages to the appropriate agency for action.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or

potentially significant military application. Other requests for this document must be referred to  
Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458:

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**System Short Name:** SER- PFED

**Reference** (Boutin et al., 2005):

Boutin, M. C., Omole, A., Rambo, P., Nicholson, N., Wetzel, R., Zirhut, M., Gomez, R., Butler, T., & Good,  
B. (2005). System Assessment (SA) for the AN/PSG-10, AN/PYG-3, and AN/PYG-4 Pocket-Sized  
Forward Entry Device (PFED) with Software Version 2.0 (SW V2.0): U.S. Army Test and Evaluation  
Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB312966.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)  
Fields and Groups:

120500 - Computer Programming and Software

120600 - Computer Hardware

Descriptors:

(U) \*COMPUTER PROGRAMS, \*DATA ACQUISITION, \*TACTICAL DATA SYSTEMS, SURVIVABILITY,  
OPERATIONAL EFFECTIVENESS, SYSTEMS ANALYSIS, PLATFORMS, COMMAND AND CONTROL  
SYSTEMS, RELEASE

Identifiers:

(U) PFED(POCKET SIZED FORWARD ENTRY DEVICE)

**System Description:**

The PFED hardware is a ruggedized commercial off-the-shelf personal digital assistant equipped  
computer with case. The PFED software runs on Microsoft Pocket Personal Computer or equivalent  
operating system. It has the capability to generate, transmit, process, and display Army package 11  
messages using MIL-STD-188-220A with 4700IB header, JVMF R5 messaging using MIL-STD-188-220C  
with 47001C header, or either package 11 or JVMF R5 messaging using the Tactical Fire Direction  
System frequency shift keying. The PFED uses secure or nonsecure communications equipment to  
interface with the FIST system and other command and control systems.

**Interfaces and Inter-operability.** The PFED is designed to interface with the SingleChannel Ground and  
Airborne Radio System Advanced System Improvement Program (SINCGARS ASIP) combat net radio,  
the ANIPSC-5C Satellite Radio, the ANIPRC-150 HighFrequency Manpack Radio and the precision  
lightweight global positioning system (GPS) receiver (PLGR) or embedded GPS receiver. The PFED must  
also inter-operate with the Field Artillery Tactical Data System (FATDS) through the handheld terminal  
unit (HTU), ruggedized handheld computer (RHC) and laser devices such as the Lightweight Laser  
Designator Rangefinder (LLDR), digital mini eye-safe laser infrared observation set (MELIOS), the Leica  
Vector.

**Background.** As part of the AFATDS program, the PFED is a project to leverage existing commercial-  
based handheld information technologies to improve the portability and increase the efficiency of  
dismounted tactical data systems currently in-use by the FOs. The PFED is designed to allow the FO to  
communicate digitally with the company fire support officer (FSO) over the radio frequency lower tactical  
internet. The FSO uses an HTUIRHC/SCUIFED configured in FSO mode or equivalent system. Once the  
message is received by the FSO, the messages are routed to the battalion (BN) fire support element  
(FSE). The BN FSE then routes the messages to the appropriate agency as deemed necessary.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in  
order to protect information and technical data that address current technology in areas of significant or  
potentially significant military application. Other requests for this document must be referred to  
Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458:

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**System Short Name:** SER- PG

**Reference** (Frazier et al., 2001):

Frazier, T., Landy, K., Finanger, K., Meirose, S., & Jastrab, G. (2001). System Evaluation Report (SER) for the Protective Glove (PG): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 12838569. DTIC ADB271167.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

230400 - Protective Equipment

Descriptors:

(U) \*ARMY PERSONNEL, \*PROTECTIVE CLOTHING, \*GLOVES, \*MILITARY POLICE, OFF THE SHELF EQUIPMENT, COMMERCIAL EQUIPMENT, HANDS, CIVIL DISTURBANCES, RIOT CONTROL

**System Description:**

The PG is a commercial off-the-shelf item acquired as part of the Soldier Enhancement Program. The PG consists of two different types of gloves: the Law Enforcement Frisk Protective Glove (LEFPG) and the Riot Control/Civil Disturbance Protective Glove (RC/CD PG). The LEFPG will protect the soldier's hand from cuts, punctures, and abrasions during routine daily law enforcement operations. The RC/CD PG has a glove and a removable forearm protector which will protect the soldier's hand and forearm from heavy blunt trauma force during riot control and civil disturbance operations. The gloves are to be worn by U.S. Army MP Corps soldiers and Federal police officers while performing civil law enforcement operations, combat operations, and training exercises.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Phoenix

**Reference** (Willoughby et al., 2006):

Willoughby, P., Krall, A., Smith-Hicks, A., Chui, H., Chow, T., Jones, M., Pliscof, M., Davis, T., Miller, D., & Manasco, C. (2006). System Evaluation Report (SER) for the Phoenix Multi-Band Super High Frequency (SHF) Satellite Terminal (Block 2 Phoenix) U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 43447936. DTIC ADB316033.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

201400 - Radiofrequency Wave Propagation

250200 - Radio Communications

Descriptors:

(U) \*COMMUNICATION SATELLITE TERMINALS, \*SUPERHIGH FREQUENCY, TEST AND EVALUATION, VERIFICATION, SURVIVABILITY, ARMY EQUIPMENT

Identifiers:

(U) SHF SATELLITE TERMINALS, SHF(SUPER HIGH FREQUENCY), SER(SYSTEM EVALUATION REPORT)

**System Description:**

The Phoenix Terminal is an Expanded Capacity Vehicle (ECV) M1113 mounted, multi-channel Tactical Satellite (TACSAT) terminal. Phoenix operates in the Super High Frequency (SHF) bands. The tri-band Block 1 version of Phoenix is already in production. This report assesses the quad-band Block 2 version, which adds a Ka band capability to the X, C, and Ku band functionality of Block 1. The Phoenix is

configured for operation with either an integral Small Aperture Antenna (SAA) or an external Large Aperture Antenna (LAA), which is the AS-4429/TSC LHGX. The integral, quad-band SAA will operate on the C, X, Ku, and Ka bands. The external LAA will operate at X-Band. The Phoenix may operate worldwide with any of the following satellites: DSCS, WGS', North Atlantic Treaty Organization (NATO), SYRACUSE, International Telecommunication Satellite Organization, Pan American Satellite Organization, SKYNET4, Hispanic Satellite, and domestic satellites. For commercial bands, the Phoenix may use standard commercial gateways or Defense Information Systems Agency Tri-Band teleports and/or access the Defense Information System Network (DISN) via leased lines.

The Phoenix Terminal is integrated on two vehicles - the primary M1113 ECV on which the electronics and antenna are mounted, and the secondary Mobile Power Unit (MPU), which consists of one palletized MEP-803A 10 kilowatt (kW) Tactical Quiet Generator (TQG) and all ancillary equipment. The terminal can also operate on commercial electric power sources and generators worldwide, including 110/220 volts Alternating Current at 50/60 hertz (Hz) and the Government Furnished Equipment (GFE) 400A kit of the primary vehicle. The Phoenix may operate in either hub-spoke (default configuration on the primary vehicle, which meets joint service mission requirements) or hybrid-mesh network configurations. The hub-spoke configuration contains the equipment required to support a network consisting of up to four Enhanced Tactical Satellite Signal Processors (ETSSPs) multiplexed full duplex links. The hubspoke also consists of Orderwire (OW) communications capability for control and connectivity to Worldwide Operations Centers and necessary National Security Agency-approved Communications Security (COMSEC)/ Transmission Security (TRANSEC) for operations over satellites, and support beacon tracking for one antenna. Communications link power control and a Secure Voice OW capability are provided by an Integrated Monitoring Power and Control System (IMPCS) Transportable Network Terminal.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- PLS-CHU

**Reference** (Rouse et al., 2000):

Rouse, J., Steigerwald, R., Fujiwara, M., & Cieslak, A. (2000). System Evaluation Report (SER) for the Palletized Load System - Container Handling Unit (PLS-CHU): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 01158245. DTIC ADB252870.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

130600 - Surface Transportation and Equipment

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*LOADING(HANDLING), \*TRUCKS, LOGISTICS SUPPORT, PAYLOAD, DECISION MAKING, MILITARY VEHICLES, OPERATIONAL EFFECTIVENESS, MAINTAINABILITY, ENDURANCE(GENERAL), CONTAINERS, PALLETS, MATERIALS HANDLING VEHICLES

Identifiers:

(U) PLS(PALLETIZED LOAD SYSTEM), CHU(CONTAINER HANDLING UNIT), M-1075 TRUCKS, SER(SYSTEM EVALUATION REPORT)

**System Description:**

The CHU is a 3,800-pound pneumatically actuated mechanical device which can be mounted and stowed on an M1075 PLS truck (without crane). When attached to the PLS LHS, it enables the truck to lift and transport ISO end-opening containers from 4.25- to 8.5-feet in width and height and 20 feet in length.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- PLS-CROP

**Reference** (Rouse et al., 2000):

Rouse, J., Steigerwald, R., Fujiwara, M., & Cieslak, A. (2000). System Evaluation Report (SER) for the Palletized Load System - Container Roll-in/out Platform (PLS-CROP): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 01158246. DTIC ADB252879.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

130600 - Surface Transportation and Equipment

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*LOADING(HANDLING), \*TRUCKS, LOGISTICS SUPPORT, PAYLOAD, DECISION MAKING, MILITARY VEHICLES, OPERATIONAL EFFECTIVENESS, MAINTAINABILITY, CONTAINERS, PALLETS, MATERIALS HANDLING VEHICLES

Identifiers:

(U) PLS(PALLETIZED LOAD SYSTEM), CHU(CONTAINER HANDLING UNIT), M-1077 TRUCKS, SER(SYSTEM EVALUATION REPORT), CROP(CONTAINER ROLL-IN/OUT PLATFORM), FLATRACKS

**System Description:**

The M3 (SUMMA) and M3A1 (Hyundai) are CROPs designed to be loaded/unloaded to/from, and transported by, the PLS truck and trailer, either alone or when carried inside a standard Army 8x20 ISO container. These capabilities allow Strategic Configured Loads to be transported directly from the depot to the end user. To increase useful life of flatracks, MI077 flatracks, originally fielded with the PLS in 1995, were replaced by a more structurally robust version, designated the MI. However, as outlined in an Army Audit Agency report, the MI was not intermodal and was more expensive than the MI077 to build. Consequently, the Commanding General, U.S. Army Transportation Center and School, requested all MI funding be redirected to CROP procurement, because of their intermodal shipping and retrograde stacking characteristics. These capabilities will enhance the movement of supplies through the transportation-based distribution system.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- PLS-E MTS

**Reference** (Dillen et al., 1999):

Dillen, M., Hadjiosif, S., & Kennedy, J. (1999). System Evaluation Report (SER) for the Palletized Loading System - Enhanced (PLS-E) Movement Tracking System (MTS): U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 90367063 / DEC-98-ITE-XXX. DTIC ADB241476.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

150500 - Logistics, Military Facilities and Supplies

170700 - Navigation and Guidance

250200 - Radio Communications

Descriptors:

(U) \*TRACKING, \*GLOBAL POSITIONING SYSTEM, \*MILITARY APPLICATIONS, TEST AND EVALUATION, CONTROL, STATIONS, POSITION(LOCATION), VIBRATION, TRANSPORTATION, COMMERCE, SURVIVABILITY, LOADING(HANDLING), IDENTIFICATION, MOBILE, STATIONARY, VISIBILITY, CARGO, ELECTROMAGNETIC INTERFERENCE, MANAGEMENT PERSONNEL, INPUT OUTPUT DEVICES, SYSTEMS ANALYSIS, MAPPING, VEHICLES, MICROCOMPUTERS, MESSAGE PROCESSING, AUTOMATIC, TEST FACILITIES, RELAYS

Identifiers:

(U) MTS(MOVEMENT TRACKING SYSTEM)

**System Description:**

The MTS is a military application of a commercial system that will allow movement control management personnel to track and communicate with PLS vehicles via either a stationary or mobile control station. The MTS will incorporate a Global Positioning System (GPS), automatic identification, and non-line-of-sight communication and mapping technologies into a package that provides vehicle and cargo visibility throughout the world. The MTS will relay position data between the transportation vehicle and the control station via satellites. Short message texts can also be relayed in a similar fashion. Input/output devices are expected to be a screen and keypad (PLS-mounted) and a personal computer (control station).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Profiler-MMS-P

**Reference** (Omole et al., 2005):

Omole, A., Sereno, J., Brink, R., Diaz, K., Nicholson, N., & Barker, D. (2005). System Evaluation Report (SER) for the Meteorological Measuring Set-Profiler (MMS-P) AN/Tmq-52: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 50607964.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

**System Description:**

The Profiler is a mobile system developed for the U.S. Army to provide meteorological data to support artillery units and other users of MET data. The Profiler (AN/TPQ-52) is a suite of MET sensors and associated processing equipment that provides U.S. forces timely and accurate MET data throughout the battlespace. The components of Profiler are housed in a Standardized, Integrated Command Post System-rigid wall shelter (SICPS-RWS), which contains its own auxiliary power unit. The SICPS-RWS is mounted on the heavy variant of the High-Mobility Multipurpose Wheeled Vehicle (HMMWV). The Profiler is supported by two additional HMMWVs with trailers; one is the section reconnaissance vehicle and the other carries required supplies. The Profiler receives real-time weather data from balloon-borne sensors, surface sensors, and prediction data from the Navy Operational Global Atmospheric Prediction System (NOGAPS). These inputs are fed into the Fifth-Generation Pennsylvania State University/National Center for Atmospheric Research mesoscale model (MM5) modeling computer to produce the required MET data. The system produces atmospheric profiles up to an altitude of 30 kilometers (km) for the region within 60 km of the Profiler shelter location. The Profiler model (MM5) provides accurate temperature, atmospheric pressure, relative humidity, wind direction, and wind speed to requesting users. The MET

data are disseminated in meteorological messages using Single Channel Ground Airborne Radio Systems (SINCGARS) Advanced System Improvement Program (ASIP) radios. Profiler replaces the AN/TMQ-41 Meteorological Measuring System (MMS).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Profiler-MMS-P

**Reference** (Gouvaia, 2007):

Gouvaia, R. (2007). System Evaluation Report (SER) for the Meteorological Measuring Set Profiler (MMS-P), AN/TMQ-52A / Abbreviated (ASER): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB328678.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

040200 - Meteorology

Descriptors:

(U) \*MEASURING INSTRUMENTS, \*METEOROLOGY, TEST AND EVALUATION, WIND, ROCKETS, SMART WEAPONS, FIRE SUPPORT, VISIBILITY, WEATHER FORECASTING

Identifiers:

(U) \*MMS-P(METEROLOGICAL MEASURING SET PROFILER), MET(METEOROLOGICAL)

**System Description:**

The Profiler is a mobile system developed for the U.S. Army to provide meteorological data to support artillery units and other users of MET data. The Profiler (AN/TPQ-52A) is a suite of MET sensors and associated processing equipment that provides U.S. forces timely and accurate MET data throughout the battlespace. The components of Profiler are housed in a Standardized, Integrated Command Post System-rigid wall shelter (SICPS-RWS), which contains its own auxiliary power unit. The SICPS-RWS is mounted on the heavy variant of the High-Mobility Multipurpose Wheeled Vehicle (HMMWV). The Profiler is supported by two additional HMMWVs with trailers; one is the section reconnaissance vehicle and the other carries required supplies. The Profiler receives real-time weather data from balloon-borne sensors, surface sensors, and prediction data from the Navy Operational Global Atmospheric Prediction System (NOGAPS). These inputs are fed into the Fifth-Generation Pennsylvania State University/National Center for Atmospheric Research mesoscale model (MM5) modeling computer to produce the required MET data. The system produces atmospheric profiles up to an altitude of 30 kilometers (kin) for the region within 60 km of the Profiler shelter location. The Profiler model (MM5) provides accurate temperature, atmospheric pressure, relative humidity, wind direction, and wind speed to requesting users. The MET data are disseminated in meteorological messages using Single Channel Ground Airborne Radio Systems (SINCGARS) Advanced System Improvement Program (ASIP) radios. Profiler replaces the AN/TMQ-41 Meteorological Measuring System (MMS). Figure 1 shows an overall view of the primary components of the Profiler. Figure 2 depicts the Profiler system in an operational configuration.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- PVAB

**Reference** (Knuckles and Zwicke, 2000):

Knuckles, S., & Zwicke, R. (2000). System Evaluation Report (SER) for the Portable Vehicle Arresting Barrier (PVAB): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 01158248. DTIC ADB252753.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

130600 - Surface Transportation and Equipment

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*PORTABLE EQUIPMENT, \*MILITARY VEHICLES, \*BARRIERS, \*SYSTEMS ANALYSIS, TEST AND EVALUATION, MARINE CORPS, MILITARY REQUIREMENTS, INTEGRATED SYSTEMS, MANUFACTURING, ARMY EQUIPMENT, NETS, TRANSPORTER ERECTORS

Identifiers:

(U) \*PVAB(PORTABLE VEHICLE ARRESTING BARRIER), \*ARRESTING BARRIERS, EXPORT CONTROL, SER(SYSTEM EVALUATION REPORT), ORD(OPERATIONAL REQUIREMENTS DOCUMENT), BUMPS, CABLE COVERS, CAPTURE LINES

**System Description:**

The PVAB consists of six major elements:

- The bump, a molded urethane cable cover, commercially manufactured in interlocking 3-foot sections, that serve as storage and protection for the capture net and lines when not deployed.
- The net, constructed from commercial 13-inch nylon webbing, arrayed in a 4-foot-high by 22-foot-wide zig-zag pattern between two capture lines.
- The capture lines, SPECTRA fiber 0.375-inch-thick by 49-feet-long doubled (looped), spread the net across the roadway when the erector is activated, and transmit braking force to the net during vehicle capture.
- The erector assembly (one per each side) is a modified GENIE Hoist, controlled by a solenoid which releases compressed air from a refillable cylinder to raise telescoping rods and lift lines that lift the net and capture lines.
- Each side of the erector assembly is mounted atop a brake box assembly (one per side), which consists of a brake caliper, brake rotor, spindle, bearings, rollers, and payout reel that provide a controlled braking force during vehicle capture.
- The anchors and/or anchor lines secure the brake boxes in position when stopping force is transferred to the brake boxes from the net via the capture lines. The anchor lines have quick-connect features to allow roadside objects to be used as anchors or to connect to the PVAB anchor, a 16-inch hexagonal steel plate, buried in 2-foot-deep by 18-inch-diameter holes on either side of each brake box.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- PVIS

**Reference** (Romanko and Knuckles, 1998):

Romanko, T., & Knuckles, S. (1998). System Evaluation Report (SER) for the Portable Vehicle Immobilization System (PVIS): U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 82536072 / SER 98-08. DTIC ADB238177.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

**Fields and Groups:**

130600 - Surface Transportation and Equipment

**Descriptors:**

(U) \*PORTABLE EQUIPMENT, \*STOPPING, \*GROUND VEHICLES, TEST AND EVALUATION, SAFETY EQUIPMENT, NETS, GROUND SPEED

**Identifiers:**

(U) PVIS(PORTABLE VEHICLE IMMOBILIZATION SYSTEM)

**System Description:**

The system consists of six major elements. The "bump" which spans the roadway is composed of 3-foot sections of molded urethane cable cover used commercially to protect hoses or electrical cables routed across roadways with heavy vehicle traffic. The net which is protected by, and stored within the "bump" housing is constructed from 3-inch nylon webbing arrayed in a 4-foot high, 22-foot wide zig-zag pattern between two capture lines. The capture lines are 0.375-inch thick SPECTRA fiber ropes which are initially stored in the "bump" and are used to spread the net across the roadway much like a tennis net when the erector is activated and transmit braking force to the net during vehicle capture. The erector assembly (one per each side) is a modified GENIE Hoist controlled by a solenoid which releases compressed gas from a refillable cylinder to raise telescoping rods and lift lines for the net and capture lines. Each side of the erector assembly is mounted on the top of a brake box (one per side) which provides graduated stopping power by means of spring-loaded calipers squeezing brake pads against a disc/rotor which serves as the storage/payout reel for the remaining length of the capture lines. The anchors and/or anchor lines secure the brake boxes in position when stopping force is transferred to the brake boxes from the net via the capture lines. The anchor lines have quick-connect features to allow roadside objects to be used as anchors; or to connect to the PVIS anchor which must be buried in 2-foot deep, 18-inch diameter holes on either side of each brake box.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Radar- ETRAC

**Reference** (Thiele et al., 2005):

Thiele, J., Pappano, F., Lewis, J., Reza, J., Warrington, D., Guzman, R., & Mares, A. L. (2005). System Assessment (SA) for the Enhanced Target Range and Classification (Etrac) Modified Sentinel Radar: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADC071735. Report Classification: SECRET/NOFORN. Citation Unclassified.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

**Fields and Groups:**

170900 - Active & Passive Radar Detection & Equipment

150300 - Defense Systems

**Descriptors:**

(U) \*AIR DEFENSE, \*RADAR, \*WEAPON SYSTEM EFFECTIVENESS, TEST AND EVALUATION, SYSTEMS ANALYSIS, X BAND, IFF SYSTEMS, PHASED ARRAYS, REMOTE CONTROL, RELIABILITY, MODIFICATION, RADAR TRACKING

**Declassification:**

1 Sep 29

**Identifiers:**

(U) SENTINEL RADAR, ETRAC(ENHANCED TARGET RANGE AND CLASSIFICATION), MTBOMF(MEAN TIME BETWEEN OPERATIONAL MISSION FAILURE), MTBF(MEAN TIME BETWEEN FAILURE), REGRESSION TESTS

**System Description:**

Enhanced Target Range and Classification (ETRAC) Modified Sentinel Radar.

**Report Availability:**

Secret/NoForN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Radar- JSTARS-CGS

**Reference** (Minne et al., 1999):

Minne, S., Aragon, A., Owen, R., Swiderski, W., Palenik, W., Farrell, R., Sheroke, B., Shvern, U., Webster, H., Morel, P., Rouse, J., & Fisher, T. (1999). System Evaluation Report (SER) for the Joint Surveillance Target Attach Radar System (Joint Stars) (JSTARS) Common Ground Station (CGS): U.S. Army Test and Evaluation Command (ATEC) (Formerly U.S. Army Operational Test and Evaluation Command- OPTEC), ATTN: CSTE-EAC-CC, Park Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB244710.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

170900 - Active & Passive Radar Detection & Equipment

250200 - Radio Communications

Descriptors:

(U) \*MOVING TARGETS, \*RADAR, \*SATELLITE COMMUNICATIONS, \*GROUND STATIONS, TEST AND EVALUATION, MILITARY OPERATIONS, SIMULATION, ELECTRONICS, MOBILITY, INTEGRATED SYSTEMS, HIGH RATE, RISK, DECISION MAKING, SURVIVABILITY, BATTLEFIELDS, STRUCTURAL PROPERTIES, SHELTERS, ATTACK, OVERPRESSURE, ACCURACY, TARGETS, OPERATIONAL EFFECTIVENESS, CODING, LIMITATIONS, STATIONARY, MISSIONS, SAFETY, ELECTROMAGNETIC INTERFERENCE, TARGETING, TRAILERS, SYSTEMS ANALYSIS, TIMELINESS, MESSAGE PROCESSING, FAILURE(MECHANICS), TACTICAL WARFARE, SURVEILLANCE, BALLISTICS, DOORS, COMMERCIAL COMMUNICATIONS

Identifiers:

(U) JOINT STARS(JOINT SURVEILLANCE TARGET ATTACK RADAR SYSTEM)

**System Description:**

**General.** The Joint STARS includes airborne, ground, and support segments with the E-8C aircraft operated by the USAF and the CGS (AN/TSQ-179) operated by the Army. The airborne segment consists of several major subsystems: an aircraft subsystem, a radar subsystem, an operations and control subsystem, a communications subsystem, and a self defense suite. The Joint STARS uses radar to detect, locate, and track moving and stationary ground targets, slow-moving air targets, and rotating antennas. The E-8C crew controls the radar, monitors and uses the sensor output. The airborne sensor platform transmits multimedia radar imagery data in near-real time to ground stations at brigade through theater locations using the Surveillance and Control Data Link (SCDL). The support segment contains the Ground Support System (GSS), the Flight Crew Training System (PCTS), and the Joint STARS Integrated Maintenance Information System (IIMIS). The CGS is the Joint STARS ground segment.

**Common Ground Station (CGS).**

(1) The primary functions of the CGS are to receive, simultaneously store, and display sensor data from the Joint STARS E-8C, imagery from the Unmanned Aerial Vehicle (DAV), and reports from Intelligence Broadcast Networks (IBN). These functions support the warfighter at brigade through echelons above corps (EAC) with reconnaissance, surveillance, situation development, battlefield management, force protection, target development, and targeting for deep attack.

(2) A CGS system employs a lightweight, multipurpose shelter to house the operator workstations, a heavy High Mobility Multipurpose Wheeled Vehicle (HMMWV) as the mission vehicle, digital and voice radio communications, map digitizer, and six personnel to perform mission functions.. In addition to the

mission vehicle, the system also employs a four-passenger HMMWV as a support vehicle. Power to operate the system comes from the system's two 10-kilowatt, tactical, quiet generators mounted on two High Mobility Trailers (HMTs - M102 Trailers) pulled by the system's two HMMWVs, or power is obtained from commercial sources. The CGS is a follow on to the Interim Ground Station Module (IGSM), MGSM, and the LGSM. The functions of the CGS are the same as the LGSM with the addition of a Secondary Imagery Dissemination System (SIDS) capability and a RWS.

(3) To support the interoperability with other systems, the CGS is equipped with multiple communication equipment and interfacing devices. The CGS receives Joint STARS radar data through the SCDL and passes radar service requests (RSRs) to the E8C through the same path. The CGS disseminates intelligence and targeting information by interfacing with the All Source Analysis System (ASAS) and the Advanced Field Artillery Tactical Data System (AFATDS). The CGS also receives intelligence broadcast reports through a three-channel Commander's Tactical Terminal (CIT). In addition, the CGS can receive analyzed data via TROJAN Special Purpose Intelligence Remote Integrated Terminal (SPIRIT) II interface. Throughout this report, TROJAN SPIRIT II is referred to as TROJAN SPIRIT. Operators in the mission shelter report activity detected by the Joint STARS radar. The CGS is positioned to support EAC, corps, division, and brigade-level command, intelligence, aviation, and Fire Support Centers (FSC). Other configurations of the system include interface of the workstations of two or more CGS, and RWS displays of information in a supported tactical operations center up to 300 meters away.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Radar- JSTARS-CGS

**Reference** (Minne et al., 2002):

Minne, S., Blanchette, R., Martin-Rude, H., Spivey, O., Palenik, W., Alvarez, J., Owen, R., Sheroke, B., Morel, P., Sereno, J., Hopkins, D., & Wright, T. H., Jr. (2002). System Assessment (SA) for the Joint Surveillance Target Attack Radar System (Joint STARS) (JSTARS) Common Ground Station (CGS) and Joint Services Work Station (JSWS): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB285341.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

150600 - Military Operations, Strategy and Tactics

170900 - Active & Passive Radar Detection & Equipment

Descriptors:

(U) \*RADAR TRACKING, \*RADAR EQUIPMENT, \*GROUND STATIONS, \*INFRARED SURVEILLANCE, DECISION MAKING, MISSION PROFILES, ELECTRONIC EQUIPMENT, ARMY EQUIPMENT, JOINT MILITARY ACTIVITIES, HIGH ALTITUDE, SYSTEMS ANALYSIS, DATA LINKS, ELECTROMAGNETIC PULSES

Identifiers:

(U) \*JOINT STARS(JOINT SURVEILLANCE TARGET ATTACK RADAR SYSTEM), EXPORT CONTROL, HEMP(HIGH ALTITUDE ELECTROMAGNETIC PULSE)

**System Description:**

**General.** The Joint STARS uses radar to detect, locate, and track moving and stationary ground targets, slow-moving air targets, and rotating antennas. The Joint STARS consists of airborne, ground, and support segments, including the E-8C aircraft operated by the U.S. Air Force (USAF) and the CGS (VI), CGS (V2), or JSWS operated by the U.S. Army. The E-8C crew controls the radar and monitors and uses the sensor output. The airborne sensor platform transmits multimedia radar imagery data in near real time to ground stations at brigade through theater locations using the Surveillance and Control Data Link (SCDL). The CGS is the Joint STARS ground segment. It is a follow-on to the Light Ground Station

Module (LGSM). The CGS contains all LGSM functions plus a Secondary Imagery Dissemination System (SIDS) and a Remote Work Station (RWS).

**Common Ground Station (CGS).**

**(1) Functions.** The CGS receives and simultaneously stores and displays sensor data from the Joint STARS E-8C, imagery from Unmanned Aerial Vehicle (UAV), and reports from [Intelligence Broadcast Networks (IBN). These technical functions support the war fighter at brigade through Echelons above Corps (EAC) with reconnaissance, surveillance, situation development, battlefield management, force protection, target development, and targeting for deep attack.

**(2) Operational Requirements Document (ORD) Configuration.** A CGS system uses a lightweight, multipurpose shelter to house the operator work stations, a heavy High-Mobility Multipurpose Wheeled Vehicle (HMMWV) as the mission vehicle, digital and voice radio communications, a map digitizer, and six personnel. The system also employs an additional four-passenger HMMWV as a support vehicle. Power to operate the system comes from two possible sources: from commercial sources, or from the system's two 10-kilowatt, tactical quiet generators mounted on two M1102 HMTs and pulled by the HMMWVs.

**(3) Three-Vehicle Interim Configuration.** Because of the near-term unavailability of the HMT, the PM for the COS has temporarily fielded an interim configuration for the system (see Figure ES-2). The interim configuration consists of a M1113 HMMWV mission vehicle, a M1097A2 HMMWV support vehicle, and a M998 HTVIMWV cargo vehicle. This configuration was used in a set-up/tear-down demonstration and load plan proof-of-concept exercise conducted at Fort Bragg, North Carolina, on 25 May 2000. Note that this configuration does not have a means of transporting the system's power generators.

**Joint Services Work Station (JSWS).** The JSWS is a modular, portable CGS work station with the same software, hardware, and functional capability, when equipped with all CGS sensor interfaces and communications links. The JSWS baseline hardware configuration consists of a server, a Redundant Array of Independent Disks (RAID), an uninterruptible power supply (UPS), display, and associated support equipment. These are housed in transit cases.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Radar- JSTARS-CGS (Update)

**Reference** (Minne et al., 2000):

Minne, S., Blanchette, R., Farrell, R., Spivey, O., Palenik, W., Cook, J., Owen, R., Sheroke, B., Shvern, U., Morel, P., & Karwowski, C. (2000). System Evaluation Report (SER) for the Joint Surveillance Target Attack Radar System (Joint Stars) (JSTARS) Common Ground Station (CGS) (Update): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB257396.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

150400 - Military Intelligence

170900 - Active & Passive Radar Detection & Equipment

Descriptors:

(U) \*RADAR EQUIPMENT, \*SEARCH RADAR, \*GROUND STATIONS, TEST AND EVALUATION, COMPUTERIZED SIMULATION, DECISION MAKING, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, EXPLOSIVES, RELIABILITY, JOINT MILITARY ACTIVITIES, TARGETING, TRAILERS, SYSTEMS ANALYSIS, RADAR RECONNAISSANCE, BATTLE MANAGEMENT

Identifiers:

(U) \*JOINT STARS, STARS(SURVEILLANCE TARGET ATTACK RADAR SYSTEM), CGS(COMMON GROUND STATION), HMT(HIGH MOBILITY TRAILER), RWS(REMOTE WORKSTATION), E-8C, ASCIET(ALL SERVICES COMBAT IDENTIFICATION EVALUATION TEAM)

### **System Description:**

**General.** The Joint STARS includes airborne, ground, and support segments with the E8C aircraft operated by the United States Air Force (USAF) and the CGS (AN/TSQ-179(V)1) operated by the Army. The airborne segment consists of several major subsystems: an aircraft subsystem, a radar subsystem, an operations and control subsystem, a communications subsystem, and a self-defense suite. The Joint STARS uses radar to detect, locate, and track moving and stationary ground targets, slow-moving air targets, and rotating antennas. The E-8C crew controls the radar, monitors and uses the sensor output. The airborne sensor platform transmits multimedia radar imagery data in near-real time to ground stations at brigade through theater locations using the Surveillance and Control Data Link (SCDL). The support segment contains the Ground Support System (GSS), the Flight Crew Training System (PCTS), and the Joint STARS Integrated Maintenance Information System (nMIS). The CGS is the Joint STARS ground segment. b. Common Ground Station (CGS).

**(1) The primary functions** of the CGS are to receive, simultaneously store, and display sensor data from the Joint STARS E-8C, imagery from the Unmanned Aerial Vehicle (UAV), and reports from Intelligence Broadcast Networks (IBN). These functions support the warfighter at brigade through echelons above corps (EAC) with reconnaissance, surveillance, situation development, battlefield management, force protection, target development, and targeting for deep attack.

#### **(2) Configuration.**

**(a) Operational Requirements Document (ORD) Configuration.** A CGS system employs a lightweight, multipurpose shelter to house the operator workstations, a heavy High Mobility Multipurpose Wheeled Vehicle (HMMWV) as the mission vehicle, digital and voice radio communications, map digitizer, and six personnel, Military Occupational Specialty (MOS) 96H, to perform mission functions. In addition to the mission vehicle, the system also employs a four-passenger HMMWV as a support vehicle. Power to operate the system comes from the system's two 10-kilowatt, tactical, quiet generators mounted on two High Mobility Trailers (HMTs - M1102 Trailers) pulled by the system's two HMMWVs, or power is obtained from commercial sources. The CGS is a follow on to the Interim Ground Station Module (IGSM), Medium Ground Station Module (MGSM), and the Light Ground Station Module (LGSM). The functions of the CGS are the same as the LGSM with the addition of a Secondary Imagery Dissemination System (SIDS) capability and a Remote Workstation (RWS).

**(b) ASCIET 00 Configuration.** Due to the unavailability of the HMT (see paragraph 3.2.3.b(1)), the CGS system configuration used at ASCIET 00 consisted of the Mission Vehicle and Support Vehicle, with each towing a PU-798 Generator Set, that utilizes a M101A3 Trailer and a 15 kilowatt (Kw) Generator. Basically, this configuration looks like the ORD configuration, except that the trailers are unable to transport any CGS mission equipment other than the generator set specific equipment.

**(c) Three Vehicle Interim Configuration.** Because of the unavailability of the HMT, the Program Manager (PM) for the CGS is considering an interim configuration for the system for hand-receipting to units until the HMT issue is resolved. The interim configuration consists of a M1097AI Mission Vehicle, a M1097AI Support Vehicle, and a M998 Cargo Vehicle (the replacement for the HMT) with a PU798/15kw generator. This configuration was used in a setup/teardown demonstration and load plan proof exercise conducted at Fort Bragg, North Carolina on 25 May 2000. Appendix B provides the results of these two events on 25 May 2000.

**(3) To support the interoperability with other systems,** the CGS is equipped with multiple communication equipment and interfacing devices. The CGS receives Joint STARS radar data through the SCDL and passes radar service requests (RSRs) to the E-8C through the same path. The CGS disseminates intelligence and targeting information by interfacing with the All Source Analysis System (ASAS) and the Advanced Field Artillery Tactical Data System (AFATDS). The CGS also receives intelligence broadcast reports through a three-channel Commander's Tactical Terminal (CIT). In addition, the CGS can receive analyzed data via TROJAN Special Purpose Intelligence Reroute Integrated Terminal (SPIRIT) II interface. Throughout this report, TROJAN SPIRIT II is referred to as TROJAN SPIRIT. Operators in the mission shelter report activity detected by the Joint Stars radar. The CGS is positioned to support EAC, corps, division, and brigade-level command, intelligence, aviation, and Fire Support Centers (FSC). Other configurations of the system include interface of the workstations of two or more CGSs, and RWS displays of information in a supported tactical operations center up to 300 meters away.

### **Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or

potentially significant military application. Other requests for this document must be referred to  
Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458:

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**System Short Name:** SER- Radar- Lynx II

**Reference** (Whitaker, 2008):

Whitaker, M. J. (2008). Operational Test Agency Follow-on Evaluation Report (OFER) for the Unmanned Aircraft System (UAS) Payloads Update (Lynx II): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 8225100063.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER, System Assessment (SA), OTA Assessment Report (OAR), OTA Milestone "x" Assessment Report (OMAR), OTA Evaluation Report (OER), OTA Follow-on Evaluation Report (OFER), Operational Test Report (OTR), Abbreviated Operational Test Report (AOTR), Army Input to the OTA Report (AIOR)

**System Description:**

This report evaluates the technical performance of the General Atomics Lynx II Radar System; and supports completion of the system development and demonstration acquisition phase of the Lynx II Radar System.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Radio- BSN

**Reference** (Smith et al., 2005):

Smith, J., Rivera, M., Jones, M., Stinnette, E., Powell, M., Manasco, C., Doyle, K., & Miller, M. (2005). System Assessment (SA) for the Brigade Subscriber Node (BSN): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB315368.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)  
Fields and Groups:

250200 - Radio Communications

150600 - Military Operations, Strategy and Tactics

Descriptors:

(U) \*BRIGADE LEVEL ORGANIZATIONS, \*NODES, \*MESSAGE PROCESSING, TEST AND EVALUATION, MEASURES OF EFFECTIVENESS, ARMY TRAINING, COMBAT READINESS, OPERATIONAL READINESS

Identifiers:

(U) \*BSN(BRIGADE SUBSCRIBER NODE), \*SYSTEM ASSESSMENT, MCR(MESSAGE COMPLETION RATE), CCR(CALL COMPLETION RATE)

**System Description:**

The BSN is a tactical-to-strategic switching interface using commercial-based technology to combine voice, data, and video switching. The BSN can send and receive the combined switching information to and from the Tactical Operation Center (TOC) Local Area Network and the Tactical Internet. Software and hardware suites augment the BSN to plan, manage, and monitor network information that is integrated and switched through the BSN.

**a. The BSN is a modular and transportable communications transmission/switching and nodal control system** designed to provide secure and non secure automatic processor-controlled switching and transmission control for both digital and analog communications for the U.S. Army at Brigade and below. It is an asset of the Combat Signal Company, which will be organic to the Initial/Interim Brigade Combat Team. It is housed in a Standardized Integrated Command Post Shelter (SICPS) V4 shelter that is mounted and transported on an MI 113 Expanded Capacity Vehicle (ECV). (See figure 1-1.) It provides Integrated Services Digital Network (ISDN) switching technology, integrates HCLOS terrestrial radios for dual homing (2-8 MBPS) transmission links, supports interfaces with Military Satellite Communications (MILSATCOM) (reach-back capabilities, provides MSE/Tri-Service Tactical Communications Program (TRITAC) interoperability with Tactical Interface Adapters, supports Multiple-Level Priority Precedence, uses Voice-over-Internet Protocol (VoIP) technology and supports Battlefield Video Teleconference (BVTC) using Multiple Conference Unit and H.320/H.323 Gateway. Switch Management of the BSN is controlled using the Common Hardware/Software (CHS)-2 Workstation with Solaris version 2.6 software, one rack-mounted personal computer acting as a server using Warfighter Information Network - Tactical (WIN-T) software, and rack-mounted personal computers using Windows 2000 software.

**b. The BSN is required to support the Brigade Combat Team (BCT).** The BSN will be organic to the brigade to allow the brigade to be self-supporting. The BCT's communications requirements combine voice, data, and video switching with organic transmission capabilities to provide a smaller, lighter, more capable system than today's Area Common User System (ACUS) can achieve. They provide improvements that are required in tactical-to-strategic interoperability, inter-service and intra-service data network interoperability. Seamless interoperability with strategic data networks, commercial, Joint, combined, and coalition data communications systems shall be made, along with the capability to handle multiple levels of security. The operational capability requires a need for high-speed data and video/imagery communications, higher bandwidth transmission links, and effective use and allocation of bandwidth, which is essential to BCT communications.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Radio- GBS TGRS

**Reference** (Matricciani et al., 2005):

Matricciani, G., Corey, W., Yu, K. K., Jones, M., Rivera, E., Smith-Hicks, A., Hink, B., Robertson, J., Norris, M., Miller, M., Ball, D., & Davis, T. (2005). System Assessment (SA) for the Global Transport Service (GBS) Transportable Ground Receive Suite (TGRS): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB313173.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

250200 - Radio Communications

250500 - Command, Control and Communications Systems

Descriptors:

(U) \*COMMAND CONTROL COMMUNICATIONS, \*RADIO BROADCASTING, \*SATELLITE COMMUNICATIONS, \*GLOBAL COMMUNICATIONS, \*RECEIVERS, TEST AND EVALUATION, GROUND LEVEL, THEATER LEVEL OPERATIONS, SYSTEMS ANALYSIS, COMMUNICATION SATELLITES, TRANSPONDERS, MESSAGE PROCESSING, JOINT MILITARY ACTIVITIES, OPERATIONAL EFFECTIVENESS, SURVIVABILITY, OPERATIONAL READINESS, PERFORMANCE(ENGINEERING), PROTOTYPES

Identifiers:

(U) \*GLOBAL BROADCASTING, GBS(GLOBAL BROADCASTING SERVICE), TGRS(TRANSPORTABLE GROUND RECEIVE SUITE), RS(RECEIVER SUITE), ONE WAY COMMUNICATIONS

**System Description:**

The GBS is a joint program executed under the AF Military Satellite Communications Joint Program Office (JPO). The GBS provides a near world-wide, high-capacity, one-way communications system capable of delivering classified and unclassified video, imagery, and other information to support joint military forces in garrison, in transit, and in theater. The GBS system consists of three segments: Space Suite (SS), Transit Suite (TS), and Receiver Suite (RS).

SS. The SS includes payloads on Navy UFO-8, 9, and 10 under the UFO acquisition program. Lease of commercial satellite services at Ku-band (to include Galaxy IOR) is required to provide service area coverage throughout the United States.

The payloads on each satellite have four transponders. Each transponder is capable of down-linking information up to 23.5 mega bits per second (Mbps). The 23.5 Mbps bandwidth of a transponder is assigned into various channels for video, unclassified data, classified data, overhead, and others. The bandwidths of the channels can be changed manually or automatically to accommodate the handling needs of information.

The payloads on each satellite are also equipped with three steerable spot-beams: one 2,000 nautical mile (nm) diameter spot-beam, and two 500 nm diameter spot-beams. The spot-beams can be steered from 65 degrees south latitude to 65 degrees north latitude within their coverage areas shown in figure 1-1. Signals from up to two transponders can be transmitted in one spot-beam but, one RS can now only process the signals from one of the two transponders. In the next phase of spiral development, a RS should be capable to process the signals of two transponders being transmitted in one spot-beam. The TS organizes, controls, and transmits data to UFO or leased satellites. Each TS consists of a permanent Primary Injection Point (PIP) and an SBM. The PIP consists of antenna, frequency up-converter, and a high-power amplifier to transmit data to the payload on the UFO satellites. The SBM encompasses the hardware (HW) and software (SW) used to build the GBS information broadcasts. There are three permanent TSs. The TS in Norfolk, VA, services UFO- 9; the TS in Sigonella, Italy, services UFO-10; and the TS in Wahiawa, HI, services LUFO-8. A TIP is a mobile uplink with the capability to transmit over any satellite. A TIP gives a deployed commander the ability to rapidly distribute theater-specific products to fielded units without having to back-haul the data to TS.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Radio- Handheld- ICOM IC-F3 SI

**Reference** (Ryan, 1998):

Ryan, M. (1998). System Evaluation Report (SER) for the Soldier Intercom (Si): U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 82586094 / SER 98-06. DTIC ADB237280.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

250200 - Radio Communications

Descriptors:

(U) \*ARMY PERSONNEL, \*SYSTEMS ANALYSIS, \*INTERCOMMUNICATION SYSTEMS, TEST AND EVALUATION, MATERIEL, UNITED STATES, SURVIVABILITY, INFANTRY, TEAMS(PERSONNEL), OPERATIONAL EFFECTIVENESS, CLASSIFICATION, COMMUNICATION AND RADIO SYSTEMS, PANAMA

Identifiers:

(U) SI(SOLDIER INTERCOM), ISR(INDIVIDUAL SOLDIER RADIO)

**System Description:**

The SI is an ICOM IC-F3 radio listed in the General Services Administration catalog. It is a two-way (transmit/receive) voice communication, high/low power (5-watt/1-watt), hand-held scanning radio with 16 programmable channels covering the frequency range from 147 to 174 megahertz. The radio set includes the transmitter/receiver in a hardened plastic case, a 7" flexible antenna, speaker and microphone, 9.6 volt, 1050 milliampere-hour NiMH battery pack, battery charger, case for 8 nonrechargeable AAA size alkaline cells, nylon storage case, and a chest-mounted harnesstype carrying case. Its weight is 14.9 ounces (21.2 ounces with carrying case) and its dimensions are 6.2" high, 2.7" wide, and 2.2" deep.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Radio- HF NOE COMM AN/ARC-220

**Reference** (Nair et al., 1997):

Nair, S. S., Vogt, J., Pillot, H., Riddle, M., Tran, J., & Wells, D. (1997). System Evaluation Report (SER) for the High Frequency, Nap-of-the-Earth Communications (Hf Noe Comm) System Consisting of the AN/Arc-220 and Advanced Narrowband Digital Voice Terminal (Andvt) Airterm Ky-100 U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. AVTD, Ft. Hood, TX. DTIC ADB233090

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

250200 - Radio Communications

Descriptors:

(U) \*VOICE COMMUNICATIONS, \*COMMUNICATION TERMINALS, TEST AND EVALUATION, NATIONAL GUARD, HIGH FREQUENCY, AIRCRAFT, PRODUCTION, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, COMMAND AND CONTROL SYSTEMS, TEST VEHICLES, QUALIFICATIONS, CLASSIFICATION, GROUND VEHICLES, COMMUNICATION AND RADIO SYSTEMS, SYSTEMS ANALYSIS, ARMY, ARMY OPERATIONS, TEST FACILITIES, ROTARY WING AIRCRAFT, GROUND STATIONS, ARMY AIRCRAFT, LOW ALTITUDE

Identifiers:

(U) ANDVT(ADVANCED NARROWBAND DIGITAL VOICE TERMINAL), AN/ARC-220

**System Description:**

**HF NOE COMM Radios.** The HF NOE COMM is a non-developmental item (NDI), acquisition category (ACAT) III, that is intended to replace the existing AN/ARC-102 and AN/ARC-199. The HF NOE COMM radios have two versions, the airborne version AN/ARC220 and the ground version AN/VRC-100. The existing radios AN/ARC-102 and AN/ARC-199 are deficient in automatic link establishment (ALE), electronic counter-counter measures (ECCM), and user friendliness (reduced workload). ALE is a means of automatically establishing a radio link between two HF stations or a group of stations. ALE automatically chooses the best available frequency from a preprogrammed list of frequencies to make the transmission. The ECCM function is a frequency hopping technique used to combat the effects of communications jammer and direction finding attempts. Radios operating in ECCM must hop between assigned frequencies at the same rate and time. The HF NOE COMM System can operate in either the ALE or ECCM mode but not both simultaneously. The HF NOE COMM radios integrated with KY-100 are intended to provide secure and nonsecure voice and data communications, with ALE/ECCM in 2.0-30.0 MHz frequency band, between Army aircraft flying NOE profiles and between aircraft and ground radios. **AIRTERM KY-100 Secure Device.** AIRTERM is a member of the family of Advanced Narrowband Digital Voice Terminals (ANDVT): TACTERM (AN/USC-43), MINTERM (KY99A), and AIRTERM (KY-100). The device provides secure transmissions of voice or data over narrowband and wideband radio systems.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Radio- JTRS Cluster 5

**Reference** (Lamkin et al., 2004):

Lamkin, J., Styles, I., Venters, M., Sheroke, B., Jones, M., Krall, A., Morel, P., Powell, S., Reynolds, D., Borrero, E., Wieworka, T., & Besselman, P. (2004). System Evaluation Report (SER) for the Joint Tactical Radio System - Cluster 5 (JTRS - Cluster 5): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 40648924.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

**System Description:**

The Joint Tactical Radio System (JTRS) is a software programmable and hardware-configurable digital radio system intended to provide increased interoperability, flexibility, and adaptability to support the varied mission requirements of the warfighters. The JTRS supports Joint operations by providing the capability to transmit, receive, bridge, and cross-band between similar and diverse waveforms and network protocols used within the radio frequency spectrum and across Service boundaries. The JTRS ensures Joint operational readiness and success by providing military commanders with the ability to communicate with their forces via voice, video, and data, during all aspects of military operations. In accordance with the JTRS Acquisition Strategy approved by the Army Acquisition Executive on 3 November 2003, each JTRS Cluster acquisition plan integrates the individual Service migration plans. Clustering of requirements is intended to reduce Research, Development, Test and Evaluation (RDTE) expenditures compared to separate development efforts; provide sufficient quantities of JTRS Sets to promote competition and innovation, reduce logistics requirements, and promote interoperability. The JTRS Cluster 5 program comprises three discrete set types: Handheld, Manpack, and Small Form Factor (SFF) embedded applications. The Manpack includes vehicular dismount capability. The vehicular dismountable JTRS Sets will provide a "jerk-and-run" capability to the warfighter. The dismountable Cluster 5 JTR Set will consist of the two-channel Manpack radio and associated mounting bases, cables, and antennas. The Cluster 5 program consists of multiple variants of the SFF embedded applications. The SFF radios will be integrated into a variety of Future Combat Systems (FCS), Land Warrior, and other Service-specific (to be determined) platforms.

The Product Manager (PdM) is employing an evolutionary acquisition strategy for JTRS Cluster 5. Technical performance requirements are met over time using spiral development. Development, test, Low-Rate Initial Production (LRIP), and initial fielding will be conducted under a single contract, using separately priced options. The first spiral provides a limited capability, port available waveforms, and will comply with the performance requirements of the JTRS Operational Requirements Document (ORD) Version 3.2 Block 1. The Spiral 1 Multiservice Operational Test and Evaluation (MOTE) will be conducted using production-representative Engineering Development Model (EDM) hardware in accordance with the Cluster 5 Acquisition Decision Memorandum (ADM) signed by the Acting Defense Acquisition Executive (DAB) on 29 May 2003. A second spiral will provide expanded capability, port additional waveforms from the JTRS Joint Program Office library, and comply with performance requirements of the JTRS ORD Version 3.2 Block 2.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Radio- MBITR

**Reference** (Pettijean, 1999):

Pettijean, D. (1999). System Assessment (SA) for the Multiband Inter/Intra Team Radio (MBITR): U.S. Army Operational Test Command, Attn: CSTE-OTC-OP-O, 91012 Station Ave., Fort Hood, TX 76544-506. ABNSOTD, Ft. Bragg, NC. DTIC ADB249073.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

250200 - Radio Communications

Descriptors:

(U) \*PERFORMANCE TESTS, \*RADIO EQUIPMENT, \*HAND HELD, FREQUENCY, MILITARY OPERATIONS, LOW TEMPERATURE, OPENING(PROCESS), AIRBORNE, MISSIONS, USER NEEDS, NIGHT VISION DEVICES, PERSONNEL, GOGGLES, POSTURE(GENERAL), COLD WEATHER, STATICS, NORTH CAROLINA

Identifiers:

(U) \*MULTIBAND RADIOS, MITR(MULTIBAND INTER/INTRA TEAM RADIO)

**System Description:**

The MBITR is a hand-held multiband secure team radio that will replace current inventory short-range radios. The MBITR consists of a secure hand-held programmable transceiver unit, antennas (both broadband and high performance), rechargeable and non-rechargeable batteries, transceiver holster, headset with microphone setup, and accessory pack. There are two versions of the transceiver unit. The maritime version is capable of being submerged in salt water, without waterproofing, to a depth of 66 feet for 2 hours. The urban version is capable of being submerged in salt water to a depth of 6 feet for 30 minutes. Both are interoperable with all in-service, hand-held, and backpack radios.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Radio- SIRFC

**Reference** (Allen et al., 2002):

Allen, M., Schlaffer, N., Ripper, G. V., Rigler, L., Swiger, A., & Velasquez, R. (2002). System Assessment (SA) for the Suite of Integrated Radio Frequency Countermeasures (SIRFC) (U): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report # 21938693. Report Classification: SECRET. Citation Classification: Unclassified.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

**System Description:**

Suite of Integrated Radio Frequency Countermeasures (SIRFC) (U).

**Report Availability:**

Secret/NoForN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Radio- WIN-T

**Reference** (Smith et al., 2003):

Smith, J., Pliscol, M., Vincent, M., Bruder, B., & Jones, M. (2003). System Evaluation Report (SER) for the MS B of the Warfighter Information Network - Tactical (WIN-T): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 40358918. DTIC ADB295468.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

250200 - Radio Communications

Descriptors:

(U) \*INTEGRATED SYSTEMS, \*COMMUNICATIONS NETWORKS, MILITARY OPERATIONS, INFORMATION SYSTEMS, MISSIONS, JOINT MILITARY ACTIVITIES, INFORMATION RETRIEVAL, TACTICAL COMMUNICATIONS

**System Description:**

a. WIN-T is the integrating communications network for the Objective Force (OF). It is a mission-critical system for the OF. It is optimized for offensive and Joint operations and provides the Theater Combatant Commander the capability to coordinate multiple missions simultaneously. WIN-T will be a framework that will set standards and protocols for OF Infospheres while interfacing with and replacing equipment in current and Stryker forces infospheres while interfacing with and replacing equipment in current and Stryker forces.

b. WIN-T will be the integrating network supporting the maneuver units of action (UA) and will provide the following:

- Connectivity between UAs.
- Connectivity between UAs and units of employment (UE).
- Reach and reachback to the resources of the Global Information Grid (GIG).

This integration will enable Future Combat System (FCS) networks and systems to plug and play with the backbone network. It will be focused on moving information in a manner that supports commanders, staffs, functional units, and capabilities-based formations—all mobile, agile, lethal, sustainable, and deployable. WIN-T must enable them to plan, prepare, and execute multiple missions and tasks simultaneously. WIN-T will provide required reach, reachback, and network operations for the Maneuver UA Infospheres and seamlessly interface with the Joint Tactical Radio System (JTRS), which extends to the individual warfighter platform level. At the UE, WIN-T will provide command centers and staff elements with the communications capabilities to link to adjacent UEs, subordinate UAs, sustaining base, and Joint, Allied, and Coalition forces.

c. WIN-T is capable of supporting the full spectrum of military operations as outlined in the Army Strategic Planning Guidance and the Army Planning Guidance sections of The Army Plan. The WIN-T System will constitute a robust communications network providing reliable service to subscribers and users. The WIN-T System will automatically route information around network congestion and equipment failures. The WIN-T system will have multiple transmission paths and will be capable of routing information over various transmission systems (e.g., terrestrial, airborne, and space-based). WIN-T will minimize radio frequency (RF) signature and improve spectrum reuse.

d. WIN-T leverages the JTRS to provide multiple security levels, multimedia switching, routing, transmission, network operations, directory services, and other services that provide mobile communications. WIN-T will augment the UAs JTRS communications network with a highly mobile, transparent capability for extended Beyond Line-of-Sight (BLOS) communications. This capability will provide reachback to the UE, as well as to the GIG, Allied, and Coalition networks. This capability will be integrated and/or embedded in Operational Cells and Commander Platforms to enable Mobile Battle Command (MBC). The BLOS capability will also extend communications internal to UAs.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to

Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458:

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**System Short Name:** SER- Raptor ICO

**Reference** (Fendick, 1999):

Fendick, K. (1999). System Evaluation Report (SER) for the Milestone I of the Raptor-Intelligent Combat Outpost: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 93088151. DTIC ADB249036.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

090100 - Electrical and Electronic Equipment

250500 - Command, Control and Communications Systems

Descriptors:

(U) \*DETECTORS, \*TARGET ACQUISITION, \*AMMUNITION, \*COMMUNICATION AND RADIO SYSTEMS, MILITARY OPERATIONS, SIMULATION, DETECTION, DECISION MAKING, ACQUISITION, BATTLEFIELDS, ACCURACY, TARGETS, ENGINEERING, EMPLACEMENT, UNMANNED, SYSTEMS ANALYSIS, MANEUVERS, FIRE SUPPORT, MILITARY TACTICS, TACTICAL WARFARE

Identifiers:

(U) RAPTOR

**System Description:**

The Raptor Intelligent Combat Outpost is a suite of munitions, sensors, communications systems, and software which will enable the commander to protect his battlespace in a variety of revolutionary ways. It can be emplaced on the battlefield where the sensors will detect enemy vehicles, the communications will report that detection back to the Tactical Operations Center, and the munitions, if directed to do so, will engage the enemy using a prearranged set of tactics. The Raptor Intelligent Combat Outpost will allow the commander to accept some tactical risk in unmanned areas. It will enable him to remotely observe key areas and routes and provide him with a means to interdict, if directed, high-value targets as they advance to contact. The Raptor also allows the commander to place unmanned lethal systems in areas identified as potential enemy staging or assembly areas, to interdict and disrupt enemy movements and formations while simultaneously reporting its actions, requesting fire support, and providing detailed and highly accurate intelligence and target acquisition data. Finally, the Raptor, especially delivered deep, allows the commander to influence enemy maneuvers at the operational and tactical levels and to protect early entry forces from counterattack.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Religion- CC

**Reference** (Walker et al., 2002):

Walker, J., Juber, A., Chan, C., & Hall, J. (2002). System Evaluation Report (SER) for the Containerized Chapel (CC): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB276961.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

150500 - Logistics, Military Facilities and Supplies

**Descriptors:**

(U) \*ARMY FACILITIES, \*CHURCHES, TEST AND EVALUATION, OPERATIONAL EFFECTIVENESS, MAINTAINABILITY, RELIABILITY, ARMY EQUIPMENT, TRANSPORTABLE, SUPPLIES, RELIGION, CHAPLAINS

**Identifiers:**

(U) EXPORT CONTROL, CC(CONTAINERIZED CHAPEL)

**System Description:**

The CC is a fully functional chapel which provides religious services to base camps of 550 persons. The CC will provide worship needs for Protestant, Catholic, Jewish, Muslim, and other faith groups. All CC components will be stored inside one International Standards Organization (ISO) container. Support components will include Environmental Control Units (ECUs) to accommodate worship in climate ranges from -250 degree F through 120 degree F, a 30-kW Army Tactical Quiet Generator (TQG), and related power distribution equipment. The two Type IV TEMPER shelters (64' - by 20' total) will seat 100 personnel and will be equipped with a portable lighting and a portable address and sound system. The combined tents will have two partitions, which will divide the area into worship, religious education, and counseling spaces. The CC also will provide a variety of religious supplies (chaplain resupply kits, candles, sacramental linens, bibles, prayer books, hymnals, and a portable keyboard).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Religion- CLSP

**Reference** (Walker et al., 2001):

Walker, J., Chan, C., & Hall, J. (2001). System Evaluation Report (SER) for the Chaplaincy Logistical Support Package (CLSP): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB275671.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

150500 - Logistics, Military Facilities and Supplies

**Descriptors:**

(U) \*LOGISTICS SUPPORT, \*MILITARY SUPPLIES, LOW TEMPERATURE, MILITARY PERSONNEL, SURVIVABILITY, HIGH TEMPERATURE, TARGETS, HUMAN FACTORS ENGINEERING, ARMY EQUIPMENT, RAIN, USER NEEDS, SYSTEMS ANALYSIS, SOUTH CAROLINA, TEST FACILITIES, SEALS(STOPPERS), LIVING STANDARDS, REPLENISHMENT

**Identifiers:**

(U) EXPORT CONTROL, CLSP(CHAPLAINCY LOGISTICAL SUPPORT PACKAGE)

**System Description:**

The CLPS consists of a container which functions as a portable altar, field desk, and storage box for Unit Ministry Team (UMT) supplies. The CLSP container lid functions as a desktop and has extendable legs to function as an altar. The CLSP includes seasonal linens.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

**System Short Name:** SER- REMBASS II

**Reference** (Smyers et al., 2004):

Smyers, P., Zwicke, R., Sereno, J., Catalano, E., Gwaltney, E., & Pliscof, M. (2004). System Evaluation Report (SER) for the Remotely Monitored Battlefield Sensor System II (REMBASS II): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 42447882.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

**System Description:**

The Remotely Monitored Battlefield Sensor System IT (REMBASS II) will provide force protection coverage and warning capability for reconnaissance and surveillance troop of the Stryker Brigade during offensive, defensive, reconnaissance, and military operations in urban terrain (MOUT) operations to enhance force effectiveness and increase situational awareness. The system is the U.S. Army's unattended ground sensor system that detects, classifies, counts, and determines direction of movement of intruding personnel and vehicles. It provides worldwide deployable, day/night, all weather early warning surveillance and target classification. The sensor system is covertly deployed. The REMBASS IT system consists of three seismic-acoustic sensors, one magnetic sensor, one infrared sensor, three repeaters, two hand-held monitors (HHMs), and a laptop computer to detect intrusions. The sensors respond to seismic and acoustic disturbances, infrared energy, and magnetic field changes to detect activities. The sensors classify intruders as a person, wheeled vehicle, or tracked vehicle. This information is incorporated into short digital messages and transmitted by the frequency modulation (FM) radio burst transmitter. The sensor communicates with legacy systems either directly or through repeaters. This system allows Soldiers to monitor an area 42 kilometers away from the sensors. Messages at the receiver are demodulated, decoded, temporarily displayed, and can be ported to an attached personal computer.

- The HHM device is a durable, lightweight device that sends and receives data to and from the sensors and the repeaters. The HHM will allow Soldiers the capability to view data and program the repeaters and sensors during daylight and darkness. It produces an audible and visual signal that indicates an intrusion has occurred. To maintain noise control and situational awareness, Soldiers will be equipped with a pair of ruggedized, lightweight headphones.
- The communication modules accept intrusion signals from the sensors and transmit the FM message through three repeaters to the HHM. The radio frequency (RF) communications will be in compliance with the Army Technical Architecture. The rationale for three repeaters is to provide the long distance communications capability between the sensors and the HHM.
- The sensors relay to the HHM from the area of interest the type of intruder and direction of movement. The sensors are capable of sending a status/fault (state-of-health) indication to the monitor. The sensors operate when buried and/or covered by deliberate camouflage without degrading their performance.
- The laptop computer provides brigade commanders a visual capability to enhance situational awareness.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 5.56mm- Carbine- Buttstock-Sling- IB/CQBS

**Reference** (Luedtke and Romanko, 1999):

Luedtke, L. L., & Romanko, T. (1999). System Assessment (SA) for the Improved Buttstock and Close Quarters Battle Sling (IB/CQBS) for the Modular Weapons System (MWS): U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-CCE, Part Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB244473.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)  
Fields and Groups:

150600 - Military Operations, Strategy and Tactics

Descriptors:

(U) \*WEAPON SYSTEMS, \*DECISION SUPPORT SYSTEMS, TEST AND EVALUATION,  
SIMULATORS, DATA PROCESSING, EXPERIMENTAL DATA, ARMY PERSONNEL, ARMY  
FACILITIES, MODULAR CONSTRUCTION, ENGINEERING, DROP TESTS, SYSTEMS ANALYSIS,  
BATTLES, NORTH CAROLINA, SLINGS

**System Description:**

Improved Buttstock. The improved 5.56mm M4 Carbine buttstock is designed to provide the riflemen the necessary features for obtaining the proper shooting form~ buttstock/shoulder and buttstock/cheek interfaces, for better engagement of targets during the shoulder fire in an operational environment.

Additionally, the sling swivel, incorporated into the improved buttstock, will interface with the new combat sling which has a loop to fit around the buttstock to help hold the weapon upright and to slip over the end of the buttstock. This configuration allows the unencumbered shouldering of the weapon. The design is similar to the current buttstock except for additional material along the sides for an improved cheek interface and a longer/larger buttplate for an improved shoulder interface. The design retains the same material that has been proven for strength and chemical resistance, and the same latching mechanism components and method of operation as the current M4/M4A1 Carbine buttstock.

CQBS. The CQBS is designed to be used with the existing sling for the M4 Carbine and the M16 Rifle, and holds the weapon in an upright position. As the weapon is brought up to a firing position, the buttstock loop drops away to allow the stock to come up to the shooter unobstructed. The front of the sling connects, through a quick disconnect swivel, to a lug assembly which allows connection directly to the barrel for use when no accessories or accessories that would not interfere with the sling are used. A lug on the end of a wire lanyard moves the sling out away from any accessories that may require an unobstructed field of view. This lug assembly is connected to a barrel band which goes around the barrel, under the front sight post.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 5.56mm- Cartridge- GREM M100

**Reference** (Juba et al., 2008):

Juba, J., Dobbs, S., & Blankenship, C. (2008). System Assessment (SA) for the Produced in Support of a Full Materiel Release Decision for the M100 Grenade Rifle Entry Munition (Grem): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB338566.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)  
Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*ACCEPTANCE TESTS, \*INSENSITIVE EXPLOSIVES, VELOCITY, LOGISTICS SUPPORT,  
MILITARY REQUIREMENTS, SURVIVABILITY, ACCURACY, OPERATIONAL EFFECTIVENESS,  
RELIABILITY, SAFETY, TRANSPORTABLE

**System Description:**

The GREM is a light-weight, muzzle launched, standoff breaching munition fired from the M16/M-4 series weapons. Two GREMs are stored in a carrier worn on the back or slung over the shoulder. When assembled for operation, the round slides over the barrel of the rifle and is propelled by either the 5.56 mm M855 service cartridge or 5.56 mm M856 tracer cartridge. The round contains an aluminum standoff rod, which is required to be assembled prior to operation. Detonation occurs when the aluminum standoff rod impacts the target, causing the firing pin to strike the detonator, which sets off the explosive train and subsequently initiates the main charge. The overpressure caused by the explosive will breach an opening through windows and exterior wood or metal clad doors. The GREM contains the following elements: (1) aluminum standoff rod; (2) warhead; (3) pyrotechnic adapter; (4) impact fuze; (5) tail assembly; and (6) bullet trap device. The fuze and the bullet trap device are located inside the tail subassembly.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 5.56mm- Cartridge- RLEM

**Reference** (Streilein, 2000):

Streilein, J. J. (2000). System Evaluation Report (SER) for the XM100 Rifle Launched Entry Munition (RLEM): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 00568211 / NA. DTIC ADB250963.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

160100 - Guided Missile Launching and Basing Support

Descriptors:

(U) \*GUN LAUNCHERS, \*RIFLES, TEST AND EVALUATION, MILITARY OPERATIONS, SURVIVABILITY, TERRAIN, ARMY EQUIPMENT, SYSTEMS ANALYSIS, URBAN AREAS

Identifiers:

(U) XM100 RIFLE, RLEM(RIFLE LAUNCHED ENTRY MUNITION), MOUT(MILITARY OPERATIONS IN URBAN TERRAIN)

**System Description:**

The RLEM is a light-weight, rifle-propelled, explosive device that will breach windows and doors while providing a safe standoff distance from the target. The RLEM is fired with the M16 rifle. It can be fired up to 50 meters away from the target. It has 150 grams of explosive, and an aluminum standoff rod to provide a separation distance between the explosive and the door/window to be breached. The RLEM creates an explosive overpressure that defeats doors and windows, allowing access to the soldiers for rapid entry. It is manufactured by an Israeli manufacturer, Rafael, and has been in use by the Israeli Defense Forces for over 8 years. The RLEM is marketed in the U.S. by Alliant Tech Systems. It is lightweight, portable, and quickly operational by a single soldier. It is 29 inches long with the aluminum standoff rod attached and weighs 1.06 pounds. The RLEM configuration for this acquisition project is launched with a bullet trap device and a service round of 5.56 ammunition. In addition to the high explosive (HE) version of the RLEM, there is an inert (also launched with a bullet trap) and training round (using a blank expelling cartridge and reusable stand-off rod).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 5.56mm- Cartridge- RLEM

**Reference** (Meirose, 2001):

Meirose, J. A. (2001). System Evaluation Report (SER) for the Rifle Launched Entry Munition (RLEM): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA DTIC ADB274807.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

190100 - Ammunition and Explosives

190600 - Guns

Descriptors:

(U) \*AMMUNITION, \*RIFLES, \*GUN LAUNCHED, TEST AND EVALUATION, SURVIVABILITY, PERFORMANCE(ENGINEERING), OPERATIONAL EFFECTIVENESS

Identifiers:

(U) M-16 RIFLES, M-4 RIFLES

**System Description:**

The RLEM is a lightweight, rifle-propelled, explosive device that is designed to breach windows and doors while providing a safe standoff distance from the target. The RLEM is fired with the M16/M4 series weapons rifle. It has 150 grams of explosive and an aluminum standoffrod to provide a separation distance between the explosive and the door/window to be breached. The RLEM creates an explosive overpressure that defeats doors and windows, allowing access to the soldiers for rapid entry. It is manufactured by an Israeli manufacturer, Rafael, and is currently in use by the Israeli Defense Forces. The RLEM is marketed in the United States by Alliant Tech Systems. It is portable and quickly made operational by a single soldier. It is 29 inches long with the aluminum standoffrod attached, and it weighs 1.06 pounds.

Live, inert, and training RLEMs were used during the PQT and IOT. The inert RLEM has the same physical characteristics as the service round, but is filled with inert material instead of the high explosive mixture in the service round. It is launched by firing 5.56mm service ammunition into a bullet trap device. It is designed to be a ballistic match to the live RLEM. The training round is launched with an M195 blank expelling charge, which develops higher pressures than the standard M200 blank cartridge. The Blank Firing Adapter must be removed if the M195 cartridge is used. The training round comes with additional standoff rods. The standoff rods are expendable, and the training round is designed to be used up to five times before replacement.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 5.56mm- Cartridge- RLNL M XM95

**Reference** (Leudtke et al., 1999):

Leudtke, L., Romanko, T., Abeyta, R., & Zwicke, R. (1999). System Evaluation Report (SER) for the XM95 Rifle Launched Non-Lethal Munition (RLnlm): U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 92568132. DTIC ADB247433.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190600 - Guns

**Descriptors:**

(U) \*CLASSIFICATION, \*RIFLES, SIMULATORS, ARMY RESEARCH, HUMAN RESOURCES, SURVIVABILITY, PERFORMANCE TESTS, HUMAN FACTORS ENGINEERING, SMALL ARMS, SYSTEMS ANALYSIS, RECOIL

**Identifiers:**

(U) XM95 GUNS

**System Description:**

The XM95 5.56mm RLNLML consists of a cylinder, 5 cm in diameter and 14 cm in length. It contains 15 rubber-covered steel balls, and fits over the flash suppressor of the M16/M4 series rifle/carbine. Each ball weighs 17 grams. The 15-ball payload is launched by a blank cartridge that accelerates a pusher plate, yielding a muzzle velocity of about 75 meters per second (m/s). The payload is then dispersed in a shotgun pattern. The effective range of the XM95 5.56mm RLNLML is 30 to 80 meters.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 5.56mm- Cartridge- RLNLML XM95

**Reference** (Cross et al., 2000):

Cross, M., Oliver, S., Cole, H., Zwicke, R., Abeyta, R., & Maruyama, D. (2000). System Assessment (SA) for the XM95 Rifle Launched Non-Lethal Munition (RLNLML): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 00568215. DTIC ADB255500.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

**Fields and Groups:**

190100 - Ammunition and Explosives

**Descriptors:**

(U) \*AMMUNITION, HUMAN RESOURCES, SURVIVABILITY, ARMY PERSONNEL, INFANTRY, TARGETS, HUMAN FACTORS ENGINEERING, RELEASE, SYSTEMS ANALYSIS, RECOIL, RIFLES, TEST FACILITIES, SCORING, GUN LAUNCHED, MILITARY POLICE, NONLETHAL WEAPONS

**Identifiers:**

(U) M-95 AMMUNITION, 5.56-MM AMMUNITION

**System Description:**

The XM95 5.56mm RLNLML consists of a cylinder, 5 centimeters (cm) in diameter and 14 cm in length. It contains 15 rubber-covered steel balls, and fits over the flash suppressor of the M16/M4 series rifle/carbine. Each ball weighs 17 grams. The 15-ball payload is launched by a blank cartridge that accelerates a pusher plate, yielding a muzzle velocity of about 75 meters per second (m/s). The payload is then dispersed in a shotgun pattern. The effective range of the XM95 5.56mm RLNLML is 30 to 80 meters.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 5.56mm- M16/M4

**Reference** (Rose et al., 2007):

Rose, A., Doonan, K., & Sokolis, B. (2007). System Assessment (SA) for the Provided as Information for PEO Soldier Phase II Dust Assessment of the M4 Carbine, M16 Rifle and M249 Machine Gun: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report # 8010100014. DTIC ADB334368.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

190600 - Guns

Descriptors:

(U) \*TEST AND EVALUATION, \*DUST, \*MACHINE GUNS, \*LUBRICANTS, \*RIFLES, DEGRADATION, PARTS, RELIABILITY, PERFORMANCE(ENGINEERING), FAILURE

Identifiers:

(U) \*M16 GUNS, \*M249 GUNS, \*M4 GUNS, SAW(SQUAD AUTOMATIC WEAPONS), CARBINES

**System Description:**

The M16, M4, and M249 are weapon systems that are currently fielded to the Army and other Services. The M16A4 rifle is an air-cooled, gas-operated, magazine-fed rifle, which fires 5.56- by 45-millimeter (mm) ammunition and has a semiautomatic and three-round burst capability. The M4 carbine design is a derivative of the M16 rifle. The M4 also fires 5.56-mm ammunition and has a semiautomatic and three-round burst capability. The M249 light machine gun fills the dual role of squad automatic weapon (SAW) in the infantry and crew served machine gun for some support units. The M249 is aircooled, gas-operated, belt-fed, and fires from the open-bolt position. The M249 fires the same 5.56-mm ammunition as the M16/M4.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 5.56mm- M16/M4- Sight- CCO

**Reference** (Mahana and Alvarez, 1997):

Mahana, J. C., & Alvarez, M. (1997). System Evaluation Report (SER) for the Close Combat Optic (CCO): U.S. Army Test and Evaluation Command (ATEC) (Formerly U.S. Army Operational Test and Evaluation Command- OPTEC), ATTN: CSTE-EAC-CC, Park Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB226723.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

200600 - Optics

150600 - Military Operations, Strategy and Tactics

Descriptors:

(U) \*OPTICS, \*CLOSE SUPPORT, \*COMBAT SUPPORT, TEST AND EVALUATION, REQUIREMENTS, GROUND LEVEL, MARYLAND, EXPERIMENTAL DATA, ACQUISITION, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, FEASIBILITY STUDIES, DOCUMENTS, SYSTEMS ANALYSIS, GEORGIA

Identifiers:

(U) ORD(OPERATIONAL REQUIREMENTS DOCUMENT)

**System Description:**

The CCO is a reflex collimator sight with unity power optics designed to provide the soldier with improved situational awareness when engaging targets from 0-300 meters. The firer keeps both eyes open and, potentially, maintains situational awareness of his close-in surroundings. To decrease aiming error, the CCO is intended to eliminate the difficulty of aligning the rear and front sights of the weapon to the target. The CCO uses an illuminated dot as an index point of aim. The CCO and its mounting hardware are designed to be used with both the present and Modular Weapon System variations of the M4 Carbine and M16A2 rifle.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 5.56mm- M16/M4- Sight- LWTS

**Reference** (Britton et al., 2002):

Britton, D., Reich, P., Johnson, I., Jones, T., Rambo, P., & Swicke, R. (2002). System Evaluation Report (SER) for the AN/PVS-13B(V)1 Light Thermal Weapon Sight (LTWS): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB283277.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

140200 - Test Facilities, Equipment and Methods

190500 - Fire Control and Bombing Systems

201300 - Thermodynamics

Descriptors:

(U) \*WEAPONS, \*GUN SIGHTS, \*BOLOMETERS, THERMAL PROPERTIES, EXPERIMENTAL DATA, INTEGRATED SYSTEMS, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, SMALL ARMS

Identifiers:

(U) EXPORT CONTROL, LTWS(LIGHT THERMAL WEAPON SIGHT), AN/PAS-13B(V)1, THERMAL WEAPONS, SER(SYSTEM EVALUATION REPORT)

**System Description:**

The LTWS is a totally passive, lightweight, battery powered, uncooled infrared (IR) imaging device, designed to provide increased sighting capabilities to soldiers using individual weapons, during daylight and periods of limited visibility. The LTWS must meet the needs of combat forces to acquire and engage targets with small arms and antiarmor weapon systems, during day and night, or under adverse visual conditions.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 5.56mm- M16/M4- Sight- LWTS II

**Reference** (Farquhar, 2006):

Farquhar, J. (2006). System Evaluation Report (SER) for the Bae Light Weapon Thermal Sight II (LWTS II), AN/PAS-13C(V)1: U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB321005.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

190500 - Fire Control and Bombing Systems

200600 - Optics

Descriptors:

(U) \*OPTICAL SIGHTS, THERMAL PROPERTIES, ARMY PERSONNEL, SYSTEMS ANALYSIS, RAIN, RELEASE

Identifiers:

(U) AN/PAS-13C(V)1

**System Description:**

The LWTS II is an infrared (IR) imaging device that is totally passive, lightweight (2 pounds including batteries), modular, and battery-powered (four AA batteries). The LWTS II attaches to the MIL-STD-1913 accessory rail. Soldiers will employ the LWTS II on the M16 series rifles, the M4 series carbine, M136 (AT-4) light anti-armor weapon, and the M203 grenade launcher. Weapon reticles are electronically generated and stored within each LWTS II.

The integral components of the end item include a LWTS II system, mounting brackets (if applicable), anti-fog towelettes, operator's manual, quick reference card, lens cleaning kit, spare battery cassette, batteries, carrying case, and a storage/transit case.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 5.56mm- M16/M4- Sight- TLOS

**Reference (OPTEC, 1998):**

OPTEC. (1998). System Evaluation Report (SER) for the Target Location and Observation System (TLOS): U.S. Army Test and Evaluation Command (ATEC) (Formerly U.S. Army Operational Test and Evaluation Command- OPTEC), ATTN: CSTE-EAC-CC, Park Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB241304.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

090300 - Lasers and Masers

150400 - Military Intelligence

170500 - Optical Detection and Detectors

171100 - Target Direction, Range and Position Finding

Descriptors:

(U) \*POSITION(LOCATION), \*OBSERVATION, \*TARGETS, \*SYSTEMS ANALYSIS, \*LASER COUNTERMEASURES, TEST AND EVALUATION, ARMY RESEARCH, TARGET ACQUISITION, OPERATIONAL EFFECTIVENESS

Identifiers:

(U) SER(SYSTEM EVALUATION REPORT), TLOS(TARGET LOCATION AND OBSERVATION SYSTEM), TAS(TARGET ACQUISITION SYSTEM), LCMS(LASER COUNTERMEASURES SYSTEM), \*TARGET LOCATION

**System Description:**

The TLOS in its basic configuration fulfills the requirements of the TAS component of LCMS. The basic TLOS consists of an image-intensification telescope and a detection laser. The telescope is a passive and active, target-acquisition, day and night scope with wide and narrow fields of view. The detection laser has a zoom lens with a range of wide to narrow. The purpose of the TLOS is to detect and illuminate targets. The TLOS is mounted on an M-16 series rifle and does not preclude the use of the rifle. A two-reticle capability allows the rifle to be used in the passive mode. The TLOS illumination function, which will provide the capability to identify points of interest to ground and air based systems, will be interoperable with current image intensifier (I2 ) devices.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 5.56mm- M16/M4A1- MWS

**Reference** (Ryan et al., 1998):

Ryan, M. C., Melrose, J., & Abeyta, R. (1998). System Evaluation Report (SER) for the Modular Weapon System (MWS): U.S. Army Test and Evaluation Command (ATEC) (Formerly U.S. Army Operational Test and Evaluation Command- OPTEC), ATTN: CSTE-EAC-CC, Park Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB234811.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

**System Description:**

The MWS is the combination of an M16A2 rifle or M4A1 carbine with a rail adapter system (RAS) which replaces the standard weapon handgrips. The RAS provides four accessory mounting rails: one on the top of the MWS at the same height as the integral receiver rail and one on each side and on the bottom of the MWS. When the mounting rails are not in use, plastic protective rail covers protect the mounting surface and provide thermal protection to the weapon operator. The MWS can mount the M203 grenade launcher with a quick attachment system in place of the bottom rail.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 5.56mm- Machine Gun- SAW M249 AP

**Reference** (Streilein, 1998):

Streilein, J. J. (1998). System Evaluation Report (SER) for the Assault Pack for the Machinegun, 5.56-MM, M249 S: U.S. Army Operational Test and Evaluation Comd., ATTN: CSTE-XXX-XXX, Part Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. USAEAC, APG, MD. Report #: 83627045 / SER 11-98. DTIC ADB240261.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

190100 - Ammunition and Explosives

190600 - Guns

Descriptors:

(U) \*MACHINE GUNS, \*MAGAZINES(ORDNANCE), \*AMMUNITION CASES, SMALL ARMS AMMUNITION, FIRING TESTS(ORDNANCE), SAFING AND ARMING(ORDNANCE), GUN MOUNTS  
Identifiers:  
(U) M-249 GUNS

**System Description:**

The M249 SAW Assault Pack is an alternative for the 200 round magazine initially fielded with the M249 SAW. There are three versions of the Assault Pack; a disposable hard pack, a reusable hard pack, and a reusable soft pack. The RHP is made of rigid plastic and has a clear, removable cover that allows the user to see how much ammunition remains in the magazine. The soft pack is made of a nylon material, with a zipper opening in the bottom for loading. The mounting interface is similar to the hard pack, but the material on the soft pack is made of a stronger plastic. The M249 SAW gunner is required to carry 600 rounds of ammunition. To accomplish this, the M249 SAW gunner will have one magazine on the weapon and one carried on his person. Four additional 100 round packs will be carried in Load Bearing Equipment.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 5.56mm- Machine Gun- SAW M249 SB

**Reference** (Oliver et al., 2000):

Oliver, S., Meirose, J., Zwicke, R., Abeyta, R., Maruyama, D., & Scutti, D. (2000). System Evaluation Report (SER) for the M249 Squad Automatic Weapon with Short Barrel: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 01938280. DTIC ADB255527.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190600 - Guns

Descriptors:

(U) \*COMBAT EFFECTIVENESS, \*AUTOMATIC WEAPONS, MANEUVERABILITY, LIFE EXPECTANCY(SERVICE LIFE), GUN BARRELS, FIRING TESTS(ORDNANCE), ACCURACY, SYSTEMS ANALYSIS, RIFLES, LIFE CYCLE TESTING, HIT PROBABILITIES, MUZZLE VELOCITY

Identifiers:

(U) EXPORT CONTROL

**System Description:**

The M249 SAW is a gas-operated, air-cooled, belt-fed or magazine-fed, automatic weapon. It has a maximum rate of fire (ROF) of 850 rounds per minute (rpm). The M249 SAW's primary use is as an automatic rifle, although it can also be used as a light machine gun. It can be fired from the shoulder, hip, or underarm positions; it can also be employed with a bipod for increased stability. The SB SAW is a modification to the SAW that shortens the overall length of the SAW. The shortened version is to be used when weapon length is a critical parameter, as in airborne operations. The short barrel for the SAW is 4 inches shorter than the standard barrel. When used with the collapsible butt-stock, the length and weight of the SAW are reduced by over 10 inches and 10 ounces, respectively.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to

Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 5.56mm- Machine Gun- Sight- MWTS II

**Reference** (Farquhar, 2006):

Farquhar, J. (2006). System Evaluation Report (SER) for the Bae Medium Weapon Thermal Sight II (MWTS II), AN/PAS-13C(V)2 / Abbreviated (ASER): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB321000.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

190500 - Fire Control and Bombing Systems

200600 - Optics

Descriptors:

(U) \*OPTICAL SIGHTS, THERMAL PROPERTIES, ARMY PERSONNEL, NIGHT, SURVEILLANCE, SYSTEMS ANALYSIS, RAIN, MACHINE GUNS

Identifiers:

(U) AN/PAS-13C(V)2

**System Description:**

The MWTS II is an infrared (IR) imaging device that is totally passive, lightweight (2.8 pound including batteries), modular, and battery powered (6 AA batteries). The MWTS II attaches to the MIL-STD-1913 accessory rail. Soldiers will employ the MWTS II on the M240B and the M249 SAW. Weapon reticles are electronically generated and stored within each MWTS II.

The integral components of the end item include a MWTS II system, operator's manual, quick reference card, lens cleaning kit, spare battery cassette, batteries, carrying case, anti-fog towelettes, and a storage/transit case.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 5.56mm- OICW

**Reference** (Smith et al., 2000):

Smith, R., Meirose, J., Musser, D., Heatwole, C., & Smoot, D. (2000). System Evaluation Report (SER) for the Objective Individual Combat Weapon (OICW): U.S. Army Evaluation Center (AEC), Aberdeen Proving Ground, MD. Report #: 10338373. DTIC ADB261941.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

170501 - Infrared Detection and Detectors

150600 - Military Operations, Strategy and Tactics

Descriptors:

(U) \*WEAPON SYSTEM EFFECTIVENESS, \*RANGE FINDING, SURVIVABILITY, LASER APPLICATIONS, ELECTROMAGNETIC INTERFERENCE, SYSTEMS ANALYSIS, INCAPACITATION

Identifiers:

(U) LAND WARRIOR VEHICLES, LASER RANGE FINDERS

**System Description:**

The OICW is a dual weapon system that combines air-bursting munitions, secondary kinetic energy munitions, and a rugged, full solution fire control. It will include embedded/appended training, embedded diagnostics, and be interoperable with Land Warrior.

**Key Features and Subsystems.** The OICW is comprised of four major subsystems.

**a. Weapon Subsystem.**

**(1) Primary Subsystem.** The Primary Weapon subsystem is the launch platform for the High Explosive Air Burst (HEAB) munitions family.

**(2) Secondary Subsystem.** The Secondary Weapon subsystem is the launch platform for the Kinetic Energy (KE) munitions family.

**b. Munitions Subsystem.**

**(1) The High Explosive (HE) Family of Munitions** includes: a) HE cartridge with both Air Burst (AB) and Point Detonating (PD) fuze capability; b) Training Practice Spotter (TPS) cartridge for firing on live fire ranges; c) Training Practice (TP) cartridge or slug; d) Blank cartridge; and e) Inert (Dummy) cartridge. (Only the HEAB and TP were tested during the ATD phase.)

**(2) The KE Family of Munitions** is the same as the current family of 5.56 mm ammunition.

**c. Target Acquisition / Fire Control Subsystem.** The Target Acquisition/Fire Control System (TA/FCS) contains three major subdivisions described below.

**(1) Target Acquisition Components.**

**(a) Thermal Sight.** This subsystem provides a 3-power scope in the infrared band with an adjusted aimpoint system.

**(b) Direct View Optics (DVO).** This subsystem is a 3-power visual band scope with an adjusted aimpoint system.

**(c) Television.** This subsystem provides a video picture from the Thermal Sight to the operator or to other external devices.

**(2) Fire Control Components.**

**(a) Laser Range Finder (LRF).** This subsystem provides a range to the target for use by the operator and the fire control system. .

**(b) BIT/BITE and Maintenance Subsystem.** This subsystem provides system status information to the operator, as well as detecting and isolating a specific set of faults.

**(c) Power Subsystem.** This subsystem is composed of a replaceable battery that provides power to all other subsystems and an external battery that provides power for longer periods in a less portable configuration.

**(d) Other Features.** The Fire Control system is also expected to include: 1) internal sensors to adjust the ballistic firing solution for weapon cant, air pressure, and temperature, 2) a compass, 3) combat identification, 4) an infrared laser aiming light and illuminator pointer, and 5) collective training (MILES like) capability.

**(3) Embedded Training (ET) Capability.** The objective of ET is to attain and sustain individuals in system operations and combat engagement simulations. The ET may include or support training practice munitions, as well as links with live and virtual simulations. The embedded features will be interoperable with existing synthetic training systems (e.g., Close Combat Tactical Trainer (CCTT) and Engagement Skills Trainer (EST)). Some ET capability may be appended to the weapons system, or integrated by a wireless system, or umbilical interface into the live fire and synthetic battlefield. The OICW ET will include programs (softw~e) for user assistance, live and virtual simulation capability, and integral connections for interoperability with collective training simulators and training instrumentation. The OICW ET will include misfire cues, target acquisition and engagement procedures, and collective combat skill engagement simulations.

**Interfaces With Existing or Planned Systems.**

**a. Land Warrior (LW) Interface.** The OICW will have a two-way interface with LW. The LW soldier will be able to see what the OICW sight sees in his Integrated Head Assembly and transmit those pictures over the Computer/Radio Subsystem. The OICW will also be compatible with other Warrior Systems including "Mounted" and "Air" versions.

**b. Soldier Equipment Interface.** The OICW will be compatible with all existing and planned soldier clothing and Load Bearing Equipment (LBE). This includes cold weather equipment and Mission Oriented Protective Posture (MOPP) IV gear. The OICW will be able to mount the M4 and M7 bayonets.

**c. Property Book and Maintenance Systems Interface.** The OICW will be designed to effectively interface with the property book and maintenance systems to save time, improve readiness, and improve record accuracy.

**d. Training Systems Interface.** The OICW will be compatible with the Engagement Skills Trainer (EST), the Close Combat Tactical Trainer (CCTT), and Multiple Integrated Laser Engagement System (MILES). Upgrade of the EST and CCTT will be required.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 7.62mm- Cartridge- APC M993

**Reference** (Luedtke et al., 1999):

Luedtke, L. L., Meirose, J. A., & Abeyta, R. (1999). System Assessment (SA) for the 7.62mm Armor Piercing Cartridge (Apc) M993: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report # 92438125.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)  
From DTIC ADB239281:

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*PRODUCTION, \*ARMY EQUIPMENT, \*ARMOR PIERCING AMMUNITION, \*CARTRIDGES, TEST AND EVALUATION, LOW TEMPERATURE, MARYLAND, LOGISTICS SUPPORT, SMALL ARMS AMMUNITION, SEQUENCES, TIME, RELIABILITY, SMOKE, FLIGHT, PRESSURE, SAFETY, EXTRACTION, RUGGEDIZED EQUIPMENT, COOK OFF, TEST FACILITIES

Identifiers:

7.62-MM CARTRIDGE

**System Description:**

The 7.62mm AP will be used in the M60 and M240 machine guns as well as the M24 sniper rifle. The bullet uses a shaped tungsten core for enhanced penetration capability. Bofors Carl Gustaf AB of Sweden currently manufactures the M993. The baseline for comparison with the M993 is the Cartridge, M80 7.62mm, Ball. The M80 has a full metal jacket and a lead core.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 7.62mm- Cartridge- SRTA

**Reference** (Meirose et al., 2000):

Meirose, J., Oliver, S., Cole, H., Zelik, H., Zwicke, R., & Abeyt, R. (2000). System Evaluation Report (SER) for the 7.62mm Short Range Training Ammunition (SRTA): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Ft Hood, TX. Report #: 03088323. DTIC ADB257402.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

**Descriptors:**

(U) \*TRAINING AMMUNITION, TEST AND EVALUATION, SURVIVABILITY, ARMY EQUIPMENT, SHORT RANGE(DISTANCE), SYSTEMS ANALYSIS, TRACER AMMUNITION

**Identifiers:**

(U) M-973 AMMUNITION, 7.62-MM AMMUNITION

**System Description:**

The 7.62mm SRTAs are designed to be ballistically equivalent to the M80 Ball/M62 Tracer service ammunition out to 100 meters, with a maximum range of 600 meters. The 7.62 SRTA will be fired from the M60 MG using the standard bipod/tripod. It will replicate the noise and recoil effects of the service ammunition. The 7.62mm SRTA can be used to conduct live-fire training on scaled ranges, restricted maneuver areas, and military operations in urbanized terrain (MOUT) scenarios. The 7.62mm SRTA is a substitute for service ammunition, not an addition to it. The 7.62mm SRTA is visually distinguishable from service ammunition by the shape of the projectile,

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 7.62mm- Machine Gun- M240E6

**Reference (Rose, 2008):**

Rose, A. (2008). System Evaluation Report (SER) for the M240E6 Medium Machine Gun (MG) / Abbreviated (ASER): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB336261.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

190600 - Guns

Descriptors:

(U) \*TEST AND EVALUATION, \*MACHINE GUNS, SURVIVABILITY, LIGHTWEIGHT, HIT PROBABILITIES, OPERATIONAL EFFECTIVENESS, RELIABILITY

Identifiers:

(U) \*M240E6 GUNS, SUITABILITY, M240B GUNS

**System Description:**

Current M240B MG. The M240B MG is an air-cooled, link-belt fed, gas-operated weapon that weighs approximately 27 pounds. Its fixed head space permits rapid barrel changing. It also includes a flash suppressor, front sight, buttstock, pistol grip, bipod, heat shield, rear sight assembly and carrying handle for the barrel. The M240B MG may be tripod mounted and used with a traverse and elevating mechanism.

M240E6 System Changes. The M240E6 Weight Reduction Program is a multiphased program to reduce the weight of the current M240B MG to less than 24 pounds. To meet this requirement, the M240E6 MG incorporates the following changes:

- Titanium receiver side plates, bottom plate, rear sight bracket, and front block.
- Redesigned barrel assembly, titanium carrying handle, and lighter weight gas housing.
- Pistol grip/trigger frame assembly composed of a metal/polymer hybrid.
- Collapsible buttstock.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to

Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 7.62mm- Machine Gun- Sight- MGO

**Reference** (Ryan et al., 1998):

Ryan, M. C., Haynes, L. C., Meirose, J. A., Winters, J., & Laughman, B. (1998). System Evaluation Report (SER) for the XM-145 Machinegun Optic (MGO): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. CCTD, Ft. Hood, TX DTIC ADB239069.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

190500 - Fire Control and Bombing Systems

Descriptors:

(U) \*MACHINE GUNS, \*ILLUMINATED SIGHTS, \*TELESCOPIC GUN SIGHTS, TEST AND EVALUATION, TARGET ACQUISITION, FIRING TESTS(ORDNANCE), OPERATIONAL EFFECTIVENESS

Identifiers:

(U) M-60 GUNS, M-240B GUNS, M-249 GUNS

**System Description:**

The MGO is a laser hardened 3.4 power telescopic sight with a battery powered illuminated reticle for the M249, M60 and M240B and includes an integral antireflection device (ARD). The reticle accommodates both 5.56 mm and 7.62mm projectile ballistic trajectories by averaging them at various ranges from 500 m, to 1200m. On the M249 and M240B, it is mounted on a (MIL STD-1913 compliant) modified feed tray cover. It can be mounted on the Picatinny or Accessory Mounting Rail for the M60 machinegun (Thermal Weapon Sight (TWS) mount). The MGO is a modified Non-Developmental Item (NDI). Use of the MGO on the M249, M60, and M240B is expected to substantially improve the effectiveness of those weapons at extended ranges, while reducing the risk of fratricide.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 7.62mm- Machine Gun- Sight- MGO

**Reference** (Luedtke et al., 1999):

Luedtke, L. L., Smith, F., Mitchell, J., Meirose, J. A., & Karwowski, C. (1999). System Evaluation Report (SER) for the Machinegun Optic (MGO): U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 92918143 / 1999-LU-CMBT-1924. DTIC ADB248068.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190500 - Fire Control and Bombing Systems

190600 - Guns

200600 - Optics

Descriptors:

(U) \*MACHINE GUNS, \*TELESCOPIC GUN SIGHTS, TEST AND EVALUATION, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, LASER APPLICATIONS, RETICLES, MEASURES OF EFFECTIVENESS

Identifiers:

(U) MGO(MACHINEGUN OPTIC), LUT(LIMITED USER TEST), M-249 GUNS, M-60 GUNS, M-240B GUNS, SRD(SIGNATURE REDUCTION DEVICE), SER(SYSTEM EVALUATION REPORT)

**System Description:**

The MGO is a laser hardened 3.4 power telescopic sight with a common battery powered illuminated reticle for the M249, M60 and M240B machine guns and includes an integral SRD. The reticle, which accommodates both 5.56 mm and 7.62 mm weapons systems, was developed from a weighted average of the projectile ballistic trajectories at various ranges from 500 m to 1200 m. On the M249 and M240B, the MGO is mounted on a (MIL STD-1913 compliant) modified feed tray cover. It can be mounted on the Picatinny or Accessory Mounting Rail for the M60 machinegun (Thermal Weapon Sight (TWS) mount). The MGO is a modified Non-Developmental Item (NDI). Use of the MGO on the M249, M60, and M240B is expected to substantially improve the effectiveness of those weapons at extended ranges, while reducing the risk of fratricide.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 7.62mm- SASS

**Reference** (Marshall et al., 2006):

Marshall, J. R., Juba, A., Beran, G., Scott, D., Savick, D., Zwicke, R., Sokolis, B., Niewenhous, G., Ashcraft, J., Aarsen, M. T., Shelton, M., & Richardson, P. (2006). System Evaluation Report (SER) for the XM110, 7.62 X 51mm Caliber Semi-Automatic Sniper System (SASS): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 62289172. DTIC ADB320160.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190600 - Guns

Descriptors:

(U) \*LINE OF SIGHT, \*WEAPON SYSTEMS, \*SNIPERS, \*MANPORTABLE EQUIPMENT, \*SEMIAUTOMATIC, TEST AND EVALUATION, ACCURACY, LETHALITY, RELIABILITY, KILL PROBABILITIES, SURVIVABILITY, OPERATIONAL READINESS

**System Description:**

The XM110 SASS is a man-portable, semi-automatic, direct line-of-sight weapon system which is intended to address shortcomings and execute missions, which cannot be accomplished with the M24 7.62mm, bolt-action, Sniper Weapons System (SWS) in support of quickly changing threat and mission requirements. The SASS provides suppressed, rapid-fire lethality against personnel targets and light materiel targets with a rapid reload capability using high capacity, ammo configurable, quick-change magazines and a greater shooter focus on engagements. It provides a stay "on the scope/stay-on-the-gun" capability to rapidly engage multiple targets.

The SASS has a high capacity (10 or 20 rounds) detachable magazine, suppressor, detachable day optic sight (DOS) and back-up iron sight (BUIS). As part of the SASS, an improved stand-alone XM151 Sniper Spotting Scope (SSS) is provided as government furnished equipment (GFE) to replace the older M144 SSS. The AN/PYS-10 Sniper Night Sight (GFE) gives the SASS night engagement capability. The SASS is optimized to fire anti-personnel M118LR and other North Atlantic Treaty Organization (NATO) standard 7.62 x 51mm ammunition, as well as the M993 armor piercing round. SASS has a MIL-STD-1913

accessory mounting rail allowing the capability to use interchangeable optic systems for all-weather, day/night target engagement. The SASS comes with a carrying case and XM151 SSS with tripod.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 7.62mm- SASS

**Reference** (Marshall et al., 2007):

Marshall, J. R., Sokolis, B., Ashcraft, G., & Niewenhou, J. (2007). System Evaluation Report (SER) for the XM110, 7.62 X 51mm Caliber Semi-Automatic Sniper System (SASS): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 72909993. DTIC ADB332273.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

140200 - Test Facilities, Equipment and Methods

150600 - Military Operations, Strategy and Tactics

Descriptors:

(U) \*OPERATIONAL READINESS, \*SNIPERS, \*OPERATIONAL EFFECTIVENESS, \*SNIPERSCOPES, TEST AND EVALUATION, HIT PROBABILITIES, FIRING RATE, RETENTION(GENERAL), ACCURACY, SURVIVABILITY

Identifiers:

(U) \*SASS(SEMI-AUTOMATIC SNIPER SYSTEM)

**System Description:**

The XM110 SASS is a man-portable, semi-automatic, direct line-of-sight weapon system which is intended to replace the M24 Sniper weapon system (SWS) and fill capability gaps that are present with that system, given the changing threat and mission requirements. The SASS provides suppressed, rapid-fire lethality against personnel targets and light material targets with a rapid reload capability using high capacity, quick-change magazines. It provides a "stay on the scope/stay-on-the-gun" capability, allowing the Sniper to focus more on his targets and less on ammunition manipulation, so he can more effectively engage multiple, rapidly fleeting targets.

SASS has a high capacity (10 or 20 rounds) detachable magazine, a suppressor, a detachable day optic sight (DOS) and a back-up iron sight (BUIS). It comes with a carrying case. As part of the SASS, an improved stand-alone XM151 Spotting Scope System (SSS) with tripod is provided as government furnished equipment (GFE) to replace the older M144 SSS. The GFE AN/PVS-IO Night Sight System (NSS) gives the SASS night engagement capability. The SASS is optimized to fire anti-personnel M118 long range (LR) and other North Atlantic Treaty Organization (NATO) standard 7.62 x 51 mm ammunition, as well as the M993 armor piercing (AP) round. The SASS has a Military Standard (MIL-STD)-1913 accessory mounting rail, providing the capability to use interchangeable optics and lasing systems for all-weather, day/night target engagement.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 7.62mm- Sight- SNS

**Reference (OPTEC, 1998):**

OPTEC. (1998). System Evaluation Report (SER) for the AN/Pvs-10 Sniper Night Sight (SNS): U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 82536069 / SER 98-05.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

**System Description:**

The SNS is a third generation image intensification device designed to operate within the visible and near-infrared wavelengths. The sight is totally passive, light, and battery powered. The SNS consists of the sight, mounting attachment, carrying case, batteries, and ancillary equipment. The SNS is a combination day and night sight used with the M-24 sniper rifle and weighs less than 5 pounds. The M-24 Sniper Rifle with the SNS mounted will be called the SNS in this test report. The comparison system will be called the SWS and is the M-24 Sniper Rifle with the M3-A Leopold scope attached.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 50 Cal- LRSR XM107

**Reference (Johnson et al., 2003):**

Johnson, I., Ortiz, M., Meirose, S., Reich, P., & Zwicke, R. (2003). System Evaluation Report (SER) for the XM107, .50 Caliber Long Range Sniper Rifle (Lrsr): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 31328818. DTIC ADB288945.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190600 - Guns

Descriptors:

(U) \*RIFLES, TEST AND EVALUATION, SURVIVABILITY, PERFORMANCE(ENGINEERING), OPERATIONAL EFFECTIVENESS, RELIABILITY, LONG RANGE(DISTANCE), SEMIAUTOMATIC WEAPONS

Identifiers:

(U) LONGE RANGE SNIPER RIFLES, XM-107 RIFLES

**System Description:**

The LRSR with attached optics/electro-optics is required to support all weather, day/night tactical dominance via rapid-fire direct fire engagements with armor penetrating, incendiary, dual-purpose ammunition. The LRSR will provide a manportable, materiel destruction capability to the sniper team and/or supported force and complement the anti-personnel fire of the M24 (7.62mm bolt action) Sniper Weapon System.

The LRSR is designed to be a direct line-of-sight system capable of delivering fire on personnel and vehicle targets out to a required 600 meters and 1,000 meters, respectively, with a semiautomatic rate of fire of at least 10 rounds per minute. The LRSR is a shoulder-fired, manportable system using standard .50 caliber ammunition, except SLAP. Major components will include a .50 caliber semi-automatic rifle, five 10-round detachable box magazines, a detachable sling, a bipod, three sighting systems [Day Optic Sight (DOS), Night Sight System (NSS), and Back-up Iron Sight (BUIS)], an extra magazine, a hard carrying case for storage/transportation and protection, and a soft carrying case for tactical operations. Also to be included as part of the system is all necessary equipment for operator maintenance to include

operator repair parts and disassembly tools, cleaning/maintenance equipment, and operator and maintenance manuals. The rifle is expected to use the MK211, .50 caliber, multi-purpose cartridge as the primary tactical round.

The LRSR consists of the Barrett Model 82A3 as the rifle and the Leupold 4.5-14X 50mm VariX III Long Range Tactical Scope (LRTS) as the day optic. After Materiel Release, the Program Manager (PM) plans to provide the Night Sight System and voice-band capable hearing protection. After TC but prior to materiel release, the PM plans to provide the Multiple Integrated Laser Engagement System (MILES) capability.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 50 Cal/7.62mm/5.56mm- Sight- HWTS II

**Reference** (Farquhar, 2006):

Farquhar, J. (2006). System Evaluation Report (SER) for the Bae Heavy Weapon Thermal Sight II (HWTS II), AN/PAS-13C(V)3: U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB321006.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

190500 - Fire Control and Bombing Systems

200600 - Optics

Descriptors:

(U) \*OPTICAL SIGHTS, THERMAL PROPERTIES, ARMY PERSONNEL, NIGHT, SYSTEMS ANALYSIS, RAIN, RELEASE

**System Description:**

The HWTS II is an infrared (IR) imaging device that is totally passive, lightweight (3.8 pounds including batteries), modular, and battery powered (6 AA batteries). The HWTS II attaches to the MIL-STD-1913 accessory rail. Soldiers will employ the HWTS II on the M4, M2, M24, M107 and MK19. Weapon reticles are electronically generated and stored within each HWTS II.

The integral components of the end item include a HWTS II system, mounting brackets (if applicable), anti-fog towelettes, operator's manual, quick reference card, lens cleaning kit, spare battery cassette, batteries, carrying case, and a storage/transit case.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 50 Cal/7.62mm/5.56mm- Sight- TWS

**Reference** (Ryan, 1998):

Ryan, M. (1998). System Evaluation Report (SER) for the Thermal Weapon Sight (TWS): U.S. Army Test and Evaluation Command (ATEC) (Formerly U.S. Army Operational Test and Evaluation Command-OPTEC), ATTN: CSTE-EAC-CC, Park Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB237498.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

190500 - Fire Control and Bombing Systems

Descriptors:

(U) \*THERMAL PROPERTIES, \*SIGHTS, WEAPONS, COMBAT EFFECTIVENESS, DECISION MAKING, SMALL ARMS AMMUNITION, ANTIARMOR AMMUNITION, CONFIGURATIONS, CLASSIFICATION, PROCUREMENT, SYSTEMS ANALYSIS

**System Description:**

The TWS is a totally passive, light, modular, battery powered, infrared (IR) imaging device.

**System Assemblies.** A TWS consists of the following eleven individual assemblies:

- Telescope assembly
- Scanner assembly
- Imager assembly
- Detector assembly
- Sensor electronics assembly
- Control electronics assembly
- Reed switch assembly
- Light emitting diode/Collimator assembly
- Eyepiece assembly
- Housing assembly
- Cover assembly

**System Configurations.** There are three TWS configurations: Light Weapon Thermal Sight (LWTS), Medium Weapon Thermal Sight (MWTS), and Heavy Weapon Thermal Sight (HWTS). Each configuration of the TWS uses the basic sensor. The only difference among the three is the type of telescope assembly. The basic sensor is a sealed unit, allowing replacement of telescope assemblies without the need for system re-purging. The Light Weapon Telescope Assembly (LWTA) is a single field-of-view (FOV) telescope, while the Medium Weapon Thermal Assembly (MWTA) and Heavy Weapon Thermal Assembly (HWTA) are dual FOV telescopes. The wide FOV is used for surveillance and target detection over the field of regard. The narrow FOV facilitates target recognition and engagement. Soldiers will employ the three configurations of the TWS on different weapon systems.

**Individual Weapon Brackets and Reticle Storage.** Individual weapon brackets have been developed during the Engineering and Manufacturing Development (EMD) phase. The reticle is electronically generated and is stored within each TWS. The recognition range for each TWS configuration meets or exceeds the maximum effective range of each supported weapon.

**Integral Components.** The integral components of the end item include a configured TWS unit, mounting bracket, operator's manual, lens-cleaning kit, spare battery (standard Army battery BA-xx47/U), carrying case, storage/transit case.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 50 Cal/7.62mm/5.56mm- Sight- TWS-OMNI

**Reference** (Britton et al., 2001):

Britton, D., Reich, P., Johnson, I., Jones, T., Rambo, P., & Zwicke, R. (2001). System Evaluation Report (SER) for the Thermal Weapon Sight (TWS) - OMNI: U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB271262.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

170501 - Infrared Detection and Detectors

190500 - Fire Control and Bombing Systems

Descriptors:

(U) \*INFRARED DETECTORS, \*GUN SIGHTS, TEST AND EVALUATION, SURVIVABILITY, WEAPON SYSTEMS, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, INFRARED IMAGES, WEAPON SYSTEM EFFECTIVENESS, SYSTEMS ANALYSIS

Identifiers:

(U) \*TWS(THERMAL WEAPON SITE), EXPORT CONTROL, SER(SYSTEM EVALUATION REPORT), AN/PAS-13

**System Description:**

The TWS is a totally passive, battery powered, infrared (IR) imaging device, designed to provide increased sighting capabilities to soldiers using individual and crew-served weapons, during daylight and periods of limited visibility. The TWS-Omni medium and heavy weapon configurations are scanning, cooled systems, where as the light weapon configuration is a staring, uncooled system.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 50 Cal/7.62mm/5.56mm- Sight- TWS-R

**Reference** (Britton et al., 2000):

Britton, D., Myers, J., Fendick, K., Jones, T., Winters, J., & Zwicke, R. (2000). System Evaluation Report (SER) for the Thermal Weapon Sight - Redesign (TWS-R): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB262805.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

190500 - Fire Control and Bombing Systems

140200 - Test Facilities, Equipment and Methods

Descriptors:

(U) \*COMBAT EFFECTIVENESS, \*SIGHTS, \*JOINT TEST AND EVALUATION, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, COMMAND AND CONTROL SYSTEMS

Identifiers:

(U) EXPORT CONTROL, AN/PAS-13, TWS(THERMAL WEAPON SIGHTS)

**System Description:**

The TWS is a totally passive, light, modular, and battery powered infrared (IR) imaging device, designed to be a Command and Control (C2) aid to small unit leaders and to provide increased sighting capabilities to soldiers using individual and crewserved weapons, during daylight and during periods of limited visibility.

**Acquisition Strategy.** The TWS acquisition strategy calls for a series of three separate performance specification contract purchases. These three separate buys will generate four distinct TWS systems. The four systems are: the TWS-LP, the TWS-R, the TWS-Ornibus (TWS-Ornni), and the Lightweight Weapon Thermal Sight (LWTS). The TWS-LP version has undergone extensive testing, which identified some deficiencies and shortcomings, but supported a limited fielding decision. The TWS-LP contract has been fulfilled, and the system has been fielded to units authorized in the Acquisition Decision Memorandum (ADM). The TWS-R is a production representative redesign (paragraph IA.3a.) of the TWS-LP, incorporating design changes to alleviate its deficiencies and shortcomings. The TWS-Omni contract currently provides for the development of both the TWS-Omni and LWTS systems. The TWS-Omni

design contains three modifications from the TWS-R system (paragraph IA.3b), whereas the LWTS system is an entirely new design using emerging non-cooled infrared (IR) technology.

**System Assemblies.** A TWS system consists of the following 10 individual assemblies:

- Telescope assembly
- Scanner assembly
- Imager assembly
- Detector assembly
- Sensor electronics assembly
- Control electronics cover cable assembly
- Eyepiece assembly
- Housing assembly
- Cover assembly
- Rail-grabber assembly

**System Configurations.** The TWS-LP, TWS-R, and TWS-Omni systems all use the same basic IR sensor which requires battery powered cooling. They each have two configurations, the Medium Weapon Thermal Sight (MWTS) and the Heavy Weapon Thermal Sight (HWTS). The MWTS and the HWTS are shown in Figure 1-3. Differences between the TWS-LP, TWS-R, TWS-Omni, and LWTS systems are explained in the following paragraphs.

a. In the TWS-LP and TWS-R system configurations, the telescope assembly is the major difference between the MWTS and the HWTS. The MWTS has a medium-powered telescope [2.0X in the wide Field of View (FOV) and 3.3X in the narrow FOV] and the HWTS has a high-powered telescope (3.3X in the wide FOV and 10X in the narrow FOV). The wide FOV is used for surveillance and target detection over the field of regard. The narrow FOV allows for target recognition and engagement. The redesign of the TWS-LP into the TWS-R incorporated the following changes:

- smaller size
- change from scanned red Light-Emitting Diodes (LEOs) to a Cathode Ray Tube (CRT)
- elimination of the flaps from the eyepiece
- change from chip-on-board to standard surface-mount technology
- movement of the input/output connector to the lower housing
- housing design compatible with die-casting
- repositioning of the cable to facilitate interface with the Strategic Enterprise Architecture (SEA)
- elimination of the LED collimator arm from the scanner frame
- addition of a zoom feature
- rotation of the FOV magnet 180°
- elimination of the purge valve on the telescope

**The TWS-Omni** is basically the same as the TWS-R system, with the following changes:

- medium-powered telescope used in the TWS-Omni MWTS was upgraded in the narrow FOV from 3.3X to 6X power
- cooling pins along the outside of the TWS-Omni housing were thickened to provide better durability during operational use by the soldier
- additional capacitors were added to the eyepiece filters to provide increased protection against Electromagnetic Interference (EMI) environments

**The LWTS** was originally tested by USAOTC in 1994 as a single Field of View (FOV) telescope. With marginal weight difference between the LWTS and the MWTS, the early LWTS variant was discontinued in favor of a completely new design utilizing non-cooled IR technology. The LWTS is still under design development.

**Integral Components.** The integral components of the end item include a configured TWS unit, mounting bracket, operator's manual, lens-cleaning kit, carrying case, the storage/transit case and a spare battery. The TWS ORO requires a non-rechargeable, disposable battery. This Army battery, designated as BA-5347/U, is lithium manganese dioxide battery. The BA-5347/U has completed testing by the U.S. Army Communications-Electronics Command (CECOM), but production contracts had not started in time to make the BA-5347/U available for evaluation in the TWS-R Initial Operational Test and Evaluation (IOTE). The U.S. Army Infantry School (USAIS) authorized the use of a lithium rechargeable battery, BB-2847/U and its associated chargers in place of BA-5347/U until BB-5347/U is fielded.

**Mounting Configurations.** The TWS ORD requires the TWS to be capable of being used in hand-held mode or mounted on weapons.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rifle- 84mm- Cartridge- Recoilless- ADM-401

**Reference** (Cross and Abeyta, 2001):

Cross, M., & Abeyta, R. (2001). System Assessment (SA) for the Area Defense Munition (ADM)-401: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. AEC, APG, MD. DTIC ADB265201.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

120300 - Statistics and Probability

190100 - Ammunition and Explosives

190600 - Guns

Descriptors:

(U) \*FLECHETTES, \*HIT PROBABILITIES, TEST AND EVALUATION, OFF THE SHELF EQUIPMENT, ANTIPERSONNEL WEAPONS, RECOILLESS GUNS

**System Description:**

The ADM-401 cartridge consists of the standard MAAWS ammunition cartridge case, propellant, percussion initiation system, with a flechette warhead. The warhead consists of a canister containing two layers of 550 steel flechettes (total of 1,100), packed in plastic cups and separated by an aluminum spacer. The flechettes are ejected from the canister by a pusher plate, using pressure from a pressure vessel inside the canister which is charged by launch pressure inside the cartridge case. Pressure vessel venting inside the canister removes the canister front cap/seal and acts on a pusher plate, ejecting the flechettes which are dispersed by spin and aerodynamic forces. Canister launch velocity is approximately 340 meters per second (mps) and approximately one-third of the flechettes have a velocity of at least 125 mps at 100 meters.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rocket- GLMRS

**Reference** (Wright et al., 1998):

Wright, G., Washington, D., Zabielski, R., Fisher, T., Peters, E., Fatula, E., Raleigh, D., & Flory, T. (1998). System Evaluation Report (SER) for the Guided Multiple Launch Rocket System (GMLRS) Integrated Test and Evaluation: U.S. Army Operational Test and Evaluation Comd., ATTN: CSTE-XXX-XXX, Part Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. USAEAC, APG, MD. Report #: 90117052 / SER 11-98. DTIC ADB234970.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

160100 - Guided Missile Launching and Basing Support

160400 - Guided Missiles

Descriptors:

(U) \*GUIDED MISSILES, TEST AND EVALUATION, INTEGRATED SYSTEMS, MANUFACTURING, DECISION MAKING, SURVIVABILITY, SYSTEMS ANALYSIS, TACTICAL WEAPONS, EXECUTIVE ROUTINES

Identifiers:

(U) GMLRS(GUIDED MULTIPLE LAUNCH ROCKET SYSTEM)

**System Description:**

The GMLRS rocket is an improved version of the ER-MLRS rocket. The primary improvements will be enhanced accuracy by the addition of Guidance and Control (G&C) elements and increased range provided by a newly designed rocket motor, reducing its payload, and additional fly-out capabilities provided by the canards. These improvements will be developed to minimize design impact to the rocket, Launch Pod Container (LPC) and system operation. The potential GMLRS rocket configuration is composed of three sections: G&C, payload, and propulsion sections.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rocket- GMLRS-DPICM

**Reference** (Alessio et al., 2005):

Alessio, P., Fatula, E., Dobbs, S., Davis, A., & Harley, K. (2005). System Evaluation Report (SER) for the Guided Multiple Launch Rocket System (GMLRS) with Dual Purpose Improved Conventional Munitions (DPICM) (U): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADC071356.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

190700 - Rockets

Descriptors:

(U) \*ARTILLERY ROCKETS, \*MULTILAUNCHING, SURVIVABILITY, ACCURACY, OPERATIONAL EFFECTIVENESS, SYSTEMS ANALYSIS, ROCKET ENGINES, GUIDED WEAPONS, SUBMUNITIONS, ROCKET LAUNCHERS, CANARD CONFIGURATIONS, EXTENDED RANGE PROJECTILES

Declassification:

31 Jan 15

Identifiers:

(U) GMLRS(GUIDED MULTIPLE LAUNCH ROCKET SYSTEM), DPICM(DUAL PURPOSE IMPROVED CONVENTIONAL MUNITIONS), ESS(EFFECTIVENESS SUITABILITY AND SURVIVABILITY)

**System Description:**

Guided Multiple Launch Rocket System (GMLRS) with Dual Purpose Improved Conventional Munitions (DPICM).

**Report Availability:**

Secret/NoForN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rocket- GMLRS-U

**Reference** (Bryan et al., 2008):

Bryan, W., Price, L., McKee, S., & Laney, J. (2008). Operational Test Agency Evaluation Report (OER) for the Xm31e1 Guided Multiple-Launch Rocket System-Unitary (GMLRS-U) Rocket. Initial Operational Test / Abbreviated (OER-a): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. ARMY OPERATIONAL TEST COMMAND FORT SILL OK FIRE SUPPORT TEST DIRECTORATE. DTIC ADC076351.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA), OTA Assessment Report (OAR), OTA Milestone "x" Assessment Report (OMAR), OTA Evaluation Report (OER), OTA Follow-on Evaluation Report (OFER), Operational Test Report (OTR), Abbreviated Operational Test Report (AOTR), Army Input to the OTA Report (AIOR)

\*multilaunching, \*rockets, \*firing tests(ordnance), flight, global positioning system, jamming, launchers, fire support, miss distance, reliability, interoperability, command control communications, inflight mlrs(multiple launch rocket system), gmlrs-u(guided multiple launch rocket system unitary), himars(high mobility artillery rocket system), excis(extensible command control communication computer and intelligence instrumentation suite), fsa(fire support

Fields and Groups:

190700 - Rockets

Descriptors:

(U) \*MULTILAUNCHING, \*ROCKETS, \*FIRING TESTS(ORDNANCE), FLIGHT, GLOBAL POSITIONING SYSTEM, JAMMING, LAUNCHERS, FIRE SUPPORT, MISS DISTANCE, RELIABILITY, INTEROPERABILITY, COMMAND CONTROL COMMUNICATIONS, INFLIGHT

Declassification:

25x3

Identifiers:

(U) MLRS(MULTIPLE LAUNCH ROCKET SYSTEM), GMLRS-U(GUIDED MULTIPLE LAUNCH ROCKET SYSTEM UNITARY), HIMARS(HIGH MOBILITY ARTILLERY ROCKET SYSTEM), EXCIS(EXTENSIBLE COMMAND CONTROL COMMUNICATION COMPUTER AND INTELLIGENCE INSTRUMENTATION SUITE), FSA(FIRE SUPPORT APPLICATION), GPS(GLOBAL POSITIONING SYSTEM), IOT(INITIAL OPERATIONAL TEST), COMPUTER SYSTEMS, SUSTAINABILITY, WARHEAD DETONATION, PRELAUNCH, MULTIPLE LAUNCH

**System Description:**

XM31E1 Guided Multiple-Launch Rocket System-Unitary (GMLRS-U) Rocket.

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rocket- Laser- SLM MILES

**Reference** (Wallace et al., 2007):

Wallace, P., Smyers, P., Bindel, S., & Beran, G. (2007). System Evaluation Report (SER) for the Full Material Release Decision for the Shoulder Launched Munition Multiple Integrated Laser Engagement System (SLM MILES): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 731710001. DTIC ADB333089.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*LASER WEAPONS, \*GRENADE LAUNCHERS, \*SHOULDER LAUNCHED WEAPONS, TEST AND EVALUATION, SIMULATORS, REQUIREMENTS, SIMULATION, ELECTRONICS, SURVIVABILITY, PERFORMANCE TESTS, ENVIRONMENTAL TESTS, PYROTECHNICS, CUEING, BATTLES, CIRCUITS, SYSTEMS ANALYSIS, RELEASE, ARMY PERSONNEL, SPECIFICATIONS, LASERS, OPERATIONAL EFFECTIVENESS, CONTROL CENTERS, SELF CONTAINED

Identifiers:

(U) RPG-7 GRENADE LAUNCHERS

**System Description:**

The Anti-Tank 4 (AT4) and Rocket Propelled Grenade 7 (RPG7) SLM MILES are stand alone devices and are designed to be operationally similar to the weapons used by Soldiers during force-on-force exercises. Each weapon simulator consists of a weapon facade and a SLM engine. The SLM engine is a stand-alone component, provided to allow for the reconfiguring of SLM systems. The SLM engine provides all of the electronic circuitry required for the simulation, pyrotechnic cueing, and laser messaging. The engine also contains a control center, which allows the operator to know the condition of the weapon and any action of the system during operation. The engine is inserted into the weapon facades to create the weapon simulators. It is powered from either an alkaline or lithium magnesium 9-volt transistor style battery and utilizes the M22, Anti-Tank Weapon Effect Signature Simulator (ATWESS).

**a. AT4.** The SLM trainer used to simulate the AT4 is functionally similar to an actual M136 AT4. The system transmits a laser message that simulates the firing of a missile. The system also activates a pyrotechnic cue to simulate the back blast.

**b. RPG7.** The SLM representing the rocket propelled grenade 7 (RPG7) is functionally less similar to an actual weapon than the AT4 version. It replicates the actual weapon including the removable warhead. Like the AT4, it transmits a laser message which simulates the firing of a missile and can activate a pyrotechnic cue to simulate the back blast.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rocket- Minefield Breaching- RAFAEL CARPET

**Reference** (Ball et al., 2003):

Ball, M., Meirose, S., Brewer, G., Foster, M., & Mallamo, J. (2003). System Assessment (SA) for the Rafael Minefield Breaching System, Carpet: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB291433.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

150606 - Land Mine Warfare

Descriptors:

(U) \*MINEFIELDS, \*MINE CLEARANCE, MILITARY REQUIREMENTS, DEFENSE SYSTEMS, KILL PROBABILITIES, SURVIVABILITY, DEMONSTRATIONS, THREAT EVALUATION, SYSTEMS ANALYSIS, TANKS(COMBAT VEHICLES), ROCKET WARHEADS, FUEL AIR EXPLOSIVES, PRESSURE MINES

Identifiers:

(U) CARPET

**System Description:**

The CARPET ordnance subsystem is a launcher assembly (2.27 metric tons / 2.5 tons) that contains up to 20 rockets (46 kg/101 pounds) with Fuel-Air Explosive (FAE) warhead and a fire control system. The add-on CARPET subsystem was designed for use by armored units to quickly produce safe and reliable

breaches through minefields. The system is used to breach anti-tank and anti-personnel minefields from the path of tanks, armored personnel carriers, or other military vehicles. To breach a passage through a minefield, the CARPET launches FAE rockets to ranges between 65 and 160 meters from the vehicle, at 5-meter intervals. The CARPET is deployed at a 65-meter standoff distance between the suspected leading edge of a minefield and the front of the armored vehicle, which affords the crew adequate protection from blast-and-fragmentation effects. The FAE rockets each consist of a solid propellant motor for propulsion. The FAE warhead contains 20 kg (44 pounds) of Propylene Oxide (PO) fuel and associated fuzing. The FAE warhead releases the PO fuel to create a "fuel air" mixture that is then ignited by two detonators ejected from the rocket. The detonation produces an overpressure shock impulse that actuates mines sensitive to overpressure effects within a radius of 6 meters from the cloud center (ground zero).

RAFAEL states that the CARPET can be mounted on a variety of tanks, personnel carriers, and trailers. Firing can be controlled from within a buttoned-up vehicle, affording maximum crew protection. The fire control system provides three firing modes: automatic, semi-automatic, or single-shot. The firing programs of the automatic and semi-automatic modes distribute the rockets in an overlapping pattern to produce a continuous breach through the minefield. The single-shot firing mode enables the operator to select the target range individually for each rocket or group of rockets (within the range span of the system, 160 to 65 meters) in order to best overcome "localized" problems such as mine clusters. For the purpose of the demonstration, RAFAEL provided the CARPET electronic Firing Control System/launcher pod mounted on the Puma vehicle (although the Puma is not part of this assessment), the fire control assembly and 60 fuel-air explosive rockets. Each contains up to 20 FAE warhead rockets. It is further noted that to increase system versatility, a family of rockets is available (or finishing development) to include smoke, bomblets, and scatterable mines. The Puma used for the YPG firings did not have the rollers or AMNIAD on front of the vehicle. This assessment only covers the feasibility of U.S. Army usage of the launcher, firing control assembly, and the FAE rocket.

It is noted that this assessment is specifically addressing the ability of only the CARPET subsystem to breach a lane in a minefield. As described above, the IDF uses the CARPET as a component of a Minefield Breaching System, and does not rely solely upon the CARPET to breach a lane. The CARPET does "soften" the minefield, but it does not by itself breach the minefield as was presented in certain RAFAEL literature.

Rocket's characteristics: length of the FAE canister is 58 cm and the diameter is 26 cm including individual packing, and probe in the deployed mode, respectively.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Rocket- SMAW-D

**Reference** (Luedtke et al., 1998):

Luedtke, L. L., Romanko, T., Heatwole, C. E., & Abeyta, R. (1998). System Assessment (SA) for the Shoulder-Launched Multipurpose Assault Weapon - Disposable (SMAW-D), the Bunker Defeat Munition (BDM).: U.S. Army Operational Test and Evaluation Comd., ATTN: CSTE-EAC-CC, Park Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB241870.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:  
190700 - Rockets

**Descriptors:**

(U) \*OPERATIONAL READINESS, \*SHOULDER LAUNCHED WEAPONS, TEST AND EVALUATION, DECISION MAKING, MODIFICATION, ASSAULT, OPERATIONAL EFFECTIVENESS, FUZES(ORDNANCE), RELIABILITY, SYSTEMS ANALYSIS, MULTIPURPOSE, FORTIFICATIONS

**Identifiers:**

(U) SMAW-D(SHOULDER LAUNCHED MULTIPURPOSE ASSAULT WEAPON DISPOSABLE),  
BDM(BUNKER DEFEAT MUNITION)

**System Description:**

The primary purpose of the SMAW-D is to defeat bunkers. It is also known as the Bunker Defeat Munition (BDM). It is a stand-alone munition, incorporated in a disposable launch tube. It does not require maintenance operations or a dedicated gunner or crew. The SMAW-D is a man-portable, self-contained, air-jumpable, single-shot direct fire munition with a dual-mode fuze for instantaneous function on hard targets and delay function on soft targets. It is capable of neutralizing field fortifications constructed of earth and timber with a single shot. The SMAW-D is intended for Army-wide use by a target audience consisting of IIB, 11M, 12B, 55B, and 55D military occupational specialties (MOSs). It is sufficiently rugged to remain safe, operational, and effective following the rigors associated with military operations. The SMAW-D can mount the AN/PVS-4 Night Sight, AN/PAQ-4AIB Aiming Device, developmental Thermal Weapon Sight (TWS), and follow-on devices and allow their effective use. It is to be operable by a gunner in the prone, kneeling, and standing positions. It has a range of 150 meters (required) and beyond.

The SMAW-D has the following features:

- Telescoping launch tube (32 inches in carry mode)
- Weight of 16 pounds.
- Proven warhead from existing SMAW (modified fins)
- Thermal battery for launch and fuze piston actuator

Launcher and propulsion characteristics:

- M7 propellant rocket motor
- Rear launcher is a filament-wound Kevlar™
- Forward launcher is thin filament-wound Kevlar™
- Firing mechanism incorporated in thermal battery
- Launcher telescopes and locks (54.8 inches)
- A rail to mount a night sight Cartridge and fuze

characteristics:

- Projectile velocity is 217 meters/second
- Warhead caliber is 83mm (aluminum case)
- Projectile weight is 9.5 pounds
- Dual-mode warhead
- Self-sensing dual-mode fuze (MK420)
- Fuze arming at 6.4 to 9.1 meters
- Limited capability against masonry walls
- Limited capability against armor

This materiel release decision addresses only the first lot of approximately 800 units that have the MK420 fuze.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- RRDF-MCS

**Reference** (Stolarz et al., 2002):

Stolarz, B., Juba, A., Barron, J., Mallamo, J., & Jones, C. (2002). System Evaluation Report (SER) for the Roll-on/Roll-Off Discharge Facility (RRDF) and Floating Causeway (FC) Subsystems of the Modular Causeway System (MCS): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 22668720. DTIC ADB282425.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER  
Fields and Groups:

131300 - Structural Engineering and Building Technology

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*MODULAR CONSTRUCTION, \*FLOATING BODIES, ROLL, MILITARY EXERCISES, MILITARY TRAINING, CAUSEWAYS

**System Description:**

a. The MCS is part of the overall LOTS capability to provide interface between strategic sealift ships, U.S. Army lighterage, and the shore when ports do not exist, are inadequate, or are denied. The MCS consists of powered and nonpowered floating platforms and has the following subsystems: RRDF, FC, MWT, and CF.

b. All of the MCS components are configured to International Organization of Standardization (ISO) dimensions in an "ISOPAK" configuration for transport by ship, rail, or line haul as well as by standard military and civilian materials handling equipment (MHE) (e.g., RTCH). The ISOPAK consists of a 40-foot center module (22,500 pounds) with two end rake modules (total of 25,000 pounds) stacked on top for handling like a 40-foot container. In the theater of operations, the ISOPAKs are broken down and assembled into "strings" that are 80 feet long by 8 feet wide (one each center module, one each right end rake, and one each left end rake; total weight 47,500 pounds).

c. The task of assembling a string can be accomplished on shore or on the deck of a strategic sealift ship. After assembly on the deck of a ship, the strings are lowered into the water and assembled into MCS sections. Three strings (three each center modules, two each center end rakes, two each right end rakes, and two each left end rakes) joined side-by-side to form one section that is 80 feet long by 24 feet wide (total weight 142,500 pounds). Strings may also be assembled into MCS sections on the ship's deck after which the entire section is lowered into the water. In either case, the MCS sections are connected using the MWT as a pusher/puller to form the RRDF, the FC, and the CF. Until the MWT is fielded (anticipated fielding 3Q03), the sideloadable warping tugs (SLWTs) will be used to perform this function. The SLWTs were originally Navy-owned assets used for causeway operations. The Navy divested themselves of all of their SLWTs over the last few years. The Army currently owns eight of the SLWTs. The SLWT cannot be broken down into modules and is transported as a complete unit on the deck of the transport ship. It is preferred that the MWTs be transported in an assembled configuration to minimize assembly time (of the RRDF, FC, or CF) when the transport ship arrives in theater.

d. End-to-end joining of the sections is accomplished using the Navy "flexor" and shear connector system (developed for the Navy causeway system) which forms a pivot joint between the sections, allowing some articulation due to wave action. The RRDF provides an interface platform between a roll-on/roll-off (RO/RO) ship ramp system and watercraft lighters for movement of equipment to the shore. The RRDF can be assembled for stem or side off-load from the ship using 17 sections.

e. The FC provides a docking pierhead for simultaneous discharge of more than one lighter and allows unassisted offloading and backloading at the beach interface for rolling stock and cargo using MHE.

f. The MWT is a self-propelled craft utilized for assembling MCS modules and strings into sections which are then assembled into an RRDF, FC, or CF. The MWT will also be used for pushing, pulling, restraining, and maneuvering each fully assembled RRDF, FC, or CF. In addition, the MWT will be used to emplace and retrieve anchors.

g. The CF is powered by an MWT with its A-frame and winch removed to allow for drivethrough capability. The CF will be moored either to the RRDF and receive rolling stock or alongside a ship and receive lift-on/lift-off (LO/LO) cargo from commercial and strategic sealift ships anchored in-stream and then transport it to shore. The CF is required to conduct unassisted beaching/retracting and drive off of rolling stock, as well as off-load of cargo using MHE.

h. The MCS is intended to be off-loaded from the transport ship, assembled, disassembled and back-loaded onto the transport ship in sea conditions of sea state (SS) 0 (threshold) or SS 1 (objective). The MCS is intended to be operated through SS 2 (threshold) or SS 3 (objective).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

**System Short Name:** SER- RSCCE

**Reference** (Brady, 1999):

Brady, W. H. (1999). System Evaluation Report (SER) for the Milestone III Decision for the Replacement Satellite Configuration Control Element (RSCCE): U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 91328028. DTIC ADB243616.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

120500 - Computer Programming and Software

220200 - Unmanned Spacecraft

Descriptors:

(U) \*OPERATIONAL EFFECTIVENESS, \*COMMUNICATION SATELLITES, TEST AND EVALUATION, DECISION MAKING, PRODUCTION, SURVIVABILITY, CONFIGURATIONS, SYSTEMS ANALYSIS, OFFICER PERSONNEL, EXECUTIVE ROUTINES

Identifiers:

(U) RSCCE(REPLACEMENT SATELLITE CONFIGURATION CONTROL ELEMENT), DSCS(DEFENSE SATELLITE COMMUNICATIONS SYSTEM)

**System Description:**

1.3.1 The RSCCE is a hardware and software system developed to monitor and control the operation of the communications subsystems on designated Defense Satellite Communications System (DSCS) III satellites. Also, the RSCCE is designed to serve as a backup for monitoring and controlling other satellite subsystems. The RSCCE provides the DSCS Operations Control System (DOCS) with a subsystem capable of satellite operational control, and the processing and monitoring of telemetry data from DSCS III satellites. This permits the DOCS to control both the satellite platform and the communications payload. To provide multiple satellite control and monitoring capability, two or more RSCCEs are required in each DOCS facility. Climate controlled buildings that provide electrical power, grounding, lighting, air-conditioning, test for electromagnetic propagation, evaluation for secure transmissions, and electromagnetic compatibility isolation will house the RSCCE. The RSCCE consists of the necessary hardware and software to perform the following system functions:

1.3.1.1 Format, generate, output commands for satellite payload and station keeping control, and verify the receipt and execution of these commands through telemetry.

1.3.1.2 Process, display, and archive satellite telemetry data.

1.3.1.3 Acquire and process externally derived satellite tracking data in order to perform orbit determination and ephemeris generation.

1.3.1.4 Perform east-west and north-south satellite maneuver planning and execution (semiautomatic).

1.3.1.5 Reload selected parameters following the execution of attitude control electronics (ACE) circumvention algorithms.

1.3.1.6 Perform RSCCE fault isolation and corrective maintenance procedures in order to maximize system availability.

1.3.1.7 Detect and respond to degradation in beacon signal quality as necessary to maintain satellite command compatibility.

1.3.2 To accomplish the system functions, the RSCCE is comprised of the following major hardware subsystems and computer programs:

1.3.2.1 Hardware Subsystems.

a. Computer and Peripheral Subsystem (CPS). The CPS consists of a rack-mounted computer with a console terminal, two table-mounted, color X-terminals with 19-inch displays, a graphic printer-plotter, and a page printer. The console is a black-and-white alphanumeric terminal that serves as the computer console terminal. The computer has an industry standard serial interface to Telemetry and Command Subsystem (TCS) and three local area Network (LAN) (ethernet) interfaces (two for communications with the DSCS Integrated Management System (DIMS) and one for communications with the X-terminals, printer-plotter, and page printer). The computer includes data storage devices to write and read archived telemetry and log data.

b. The Telemetry and Command Subsystem (TCS). The TCS consists of two racks of equipment that house the Batson encryption subsystem, the maintenance terminal, and the contractor-provided interfaces between the CPS and the Radio Frequency Interface Subsystem (RFIS) that are used to command and monitor the satellite.

#### 1.3.2.2 Software.

a. Telemetry and Command Program (TCP). The TCP denotes the principal RSCCE software that performs telemetry, command, and support functions associated with the RSCCE missions including the necessary utility and database management.

b. Communications Configuration Program (CCP). The CCP operates in conjunction with the TCP to perform DSCS III Satellite Communications Subsystem configuration functions associated with RSCCE missions. These functions include control of multi beam antenna (MBA) and gimbaled dish antenna (GDA) pointing; adjustment of onboard 5-megahertz (MHz) frequency standard; and selection of antenna connectivity, primary-redundant components, transponder gain states, and receive level monitor (RLM).

c. Orbital Control Program (OCP). The OCP is a stand-alone set of modules designed to perform all DSCS III orbit determination, ephemeris generation, and orbital management functions, including station keeping and relocation maneuvers. The satellite tracking data interface program module and maneuver command generation program modules are provided as part of the OCP.

d. Control and Display Program (CDP). The CDP denotes the software designed to perform display generation and interactive control functions associated with the RSCCE mission using the RSCCE man-machine interface (MMI). The CDP provides executive control associated with RSCCE functions.

e. Housekeeping and Anomaly Program (HAP). The HAP denotes the principal software allocated to perform the DSCS III satellite ACE circumvention recovery and housekeeping functions associated with RSCCE missions. In general, these are the platform control functions.

#### Report Availability:

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- SAMGL

#### Reference (Smyers, 2000):

Smyers, P. (2000). System Evaluation Report (SER) for the Antipersonnel Landmine Alternative (APLA) Program. Non Self Destruct-Alternative (NSD-A) (Milestone I/II Decision). Soldier-Activated Munition, Grenade Launched (Samgl) Prototype (Alliant Techsystems) U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 00988230. DTIC ADB252257.

#### Key Words:

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

150606 - Land Mine Warfare

Descriptors:

(U) \*ANTIPERSONNEL MINES, TEST AND EVALUATION, SIMULATION, MANUFACTURING, PROTOTYPES, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, LAUNCHING, SYSTEMS ANALYSIS, GRENADES, REPEATERS

Identifiers:

(U) APLA(ANTIPERSONNEL LANDMINE ALTERNATIVE), NSD-A(NON SELF DESTRUCT-ALTERNATIVE), SER(SYSTEM EVALUATION REPORT), PAT(PROTOTYPE ASSESSMENT TEST), DBBL(DISMOUNTED BATTLESPACE BATTLE LAB), ORD(OPERATIONAL REQUIREMENTS DOCUMENT), SAMGL(SOLDIER ACTIVATED MUNITION GRENADE LAUNCHED)

#### System Description:

The contractor has defined the baseline SAMGL system as consisting of six miniature grenade launchers (with six M43 grenades), an Intrusion Detection/Sensing Control Unit (ICU) with an Extended Range

Tripline Sensor (ERTS) module, a Remote Control Unit (RCU), and a communication unit used as a repeater to support non-line-of-sight and long-range missions. The fielded M16 or M18 munition, not considered a part of the baseline system, can be optionally connected to the ICU. The SAMGL normally requires a soldier decision on every fire action. Munition mockups have the same size, shape, and weight as the proposed tactical items but no functional capabilities.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- SDS

**Reference** (Grady, 2000):

Grady, E. (2000). System Evaluation Report (SER) for the Special Operations Forces Sniper/Gunshot Detection System (SDS) Type Classification - Limited Procurement: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 03428335. DTIC ADB259968.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

090100 - Electrical and Electronic Equipment

190600 - Guns

Descriptors:

(U) \*DETECTORS, \*SPECIAL OPERATIONS FORCES, PRODUCTION, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, CLASSIFICATION, PROCUREMENT, SYSTEMS ANALYSIS

Identifiers:

(U) EXPORT CONTROL, SDS(SNIPER/GUNSHOT DETECTION SYSTEM)

**System Description:**

There are three basic versions of the SDS: a portable, static, hand-emplaced version; a mobile, vehicle-mounted version with a small domed array; and a mobile, vehicle-mounted version with a standard array.

**SDS - Static Version (PILAR Mk II).** The Mk II (hereinafter referred to as the SDS-S) is a light acoustic sensor system used in detecting, locating, and classifying the origin of light caliber gunfire. The Mk II can be deployed by military forces during reconnaissance and zone surveillance missions and used as a gunfire alert system. The Mk II is composed of two tetrahedral acoustic arrays and a processing unit. The arrays are mounted on tripods. They can be separated by a distance of 50 to 400 meters and are linked to the processing unit by a cable with a length of 100 to 600 meters. Each unit weighs approximately 6.2 kg and is provided with its own transportation container equipped with a strap. The acoustic arrays provide for the detection of parameters necessary to a triangulation solution based upon bullet shock wave passage and weapon muzzle blast. This output information is analyzed by the processing unit. The arrays must be surveyed in and aligned with magnetic north to provide reference position inputs for the processing unit.

The processing unit displays and records the firing activity in terms of the origin of the shot: bearing, elevation, range, bullet speed, trajectory, and caliber. The processing unit can be continuously monitored or it can be placed in the surveillance mode, which does not require having an operator available. The processing unit is essentially a ruggedized portable computer that weighs 10 kg. Data from the processing unit can be printed or downloaded.

The arrays and processing units are fully passive devices that provide 360° of coverage. The arrays can detect subsonic and supersonic projectiles fired from weapons of 5.56-.50 cal with or without a silencer. The response time in processing is about 1.5 seconds. The origin of the shot envelope is presented in terms of bearing, elevation, and range from a reference point which is input into the processing unit. This reference point can be located anywhere.

The power supply for the system can be a separate standard battery (12 hour) or the system may be hooked up to vehicle or solar power. The arrays and processing units are intended to function in a variety of environmental conditions, during day or night.

**SDS - Vehicle Versions.** There are two versions of the vehicle PILAR: one uses the standard array (hereinafter referred to as the SDS-V) and one uses a small domed array (referred to as SDS-Vd). The vehicle versions are similar to the SDS-S in principles of operation and processing, regardless of array type or mounting. The SDS vehicle versions can be mounted on any military or civilian vehicle using a magnetic/mechanical adapter. For Phase I, efforts were directed toward using a stationary special operations armored HMMWV as a platform. Although system mounting and ability to withstand limited movement will be addressed, the dynamic processing characteristics will not be addressed. The standard array is that of the SDS-S and it weighs 6.2 kg. The small domed array weighs only 1.9 kg.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Search Mirrors

**Reference** (Frazier, 2000):

Frazier, T. (2000). System Evaluation Report (SER) for the Search Mirrors: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 03078315. DTIC ADB258974.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

050500 - Sociology and Law

Descriptors:

(U) \*MILITARY CAPABILITIES, \*SEARCHING, \*LAW ENFORCEMENT, \*MILITARY POLICE, TEST AND EVALUATION, WEAPONS, ARMY PERSONNEL, PHYSICAL PROPERTIES, EXPLOSIVES, USER NEEDS, TABLES(DATA), SYSTEMS ANALYSIS, ACCEPTABILITY

**System Description:**

The SMs are commercial off-the-shelf items acquired as part of the Soldier Enhancement Program. The SMs consist of two different types of mirrors: an inspection SM (large size) and a tactical SM (small size). Both mirrors will be used by individual soldiers, teams, or larger-sized elements of all branches of services engaged in tactical security operations, Military Operations on Urban Terrain, confinement operations, and Special Reaction Teams (SRTs).

a. The inspection SM will be a collapsible, man-portable mirror that can be quickly extended for use. This SM will be used when searching at checkpoints, gates, roadblocks, dismount points, and other areas where the mission dictates the search of vehicles or other modes of conveyance. The inspection SM will provide a view of the undercarriage and other confined spaces without the danger of the user being exposed to explosive devices and/or trip wires. This inspection SM will also allow search personnel to look into confined spaces where there is the possibility of contraband being hidden.

b. The tactical SM will be a small, unobtrusive mirror that can be carried with the soldier's equipment and quickly put into use as a device to look around corners and over or around barriers. This SM will provide the individual soldier a portable capability to observe the potential threat without the danger of exposure from threat elements.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to

Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue,  
Alexandria, VA 22302-1458:

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**System Short Name:** SER- Shotgun- 12 Gauge- MASS

**Reference** (Johnson et al., 2007):

Johnson, I., Zwicke, R., Juba, A., Lloyd, T., Beran, G., Sokolis, B., Shelton, M., & McNees, G. (2007). System Evaluation Report (SER) for the Milestone C TC-Lrip Decision for the XM26 Modular Accessory Shotgun System (MASS): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 70449225.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

**System Description:**

The XM26 MASS is a lightweight, stand-alone and host weapon mountable, shotgun system capable of attacking various targets while retaining availability and control of the host weapon system. The three MASS configurations are: stand-alone, mounted on the M4, and mounted on the M16. The MASS is a multi-shot, box magazine fed, air cooled, manually operated 12-gauge shotgun that can attach under the barrel of the M4 Carbine and M16 Rifle. When attached to the host, the MASS is sighted using the M4 and M16 sights or the M68 Close Combat Optic. Also, MASS comes equipped with a standoff device for ballistic breaching. The MASS is compatible with firing 23/4-inch and 3-inch lethal (buckshot, birdshot, slug), nonlethal (M1012 point and M1013 area rounds), and potentially door breaching (M1030) rounds.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Shotgun- Cartridge- 12 Gauge- Breaching Round M1030

**Reference** (Juha et al., 2007):

Juha, J., MacFarlane, K., & Sokolis, B. (2007). System Assessment (SA) for the Produced in Support of a Materiel Release Decision for the Cartridge, 12 Gauge Breaching Round, M1030: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB328297.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*CARTRIDGES, INPUT, MATERIEL, MILITARY REQUIREMENTS, DECISION MAKING, RELEASE, COMPANY LEVEL ORGANIZATIONS, SYSTEMS ANALYSIS, HINGES

Identifiers:

(U) M-1030 CARTRIDGES, BREACHING

**System Description:**

The M1030 is used for ballistic breaching of interior doors in urban terrain. It can be used with the Mossberg 590 3-inch chambered 12 gauge shotgun. It is designed for a single shot breach of locked interior doors. The cartridge is made with a frangible material that is expelled from the shotshell case to defeat door locks, hinges, and frames. The material does not produce fragments that can injure Soldiers or people on the inside of the door.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Shotgun- Cartridge- 12 Gauge- Breacher

**Reference** (Cross et al., 2001):

Cross, M., O'Brien, M., Cole, H., Stolarz, A., & Zwicke, R. (2001). System Evaluation Report (SER) for the 12 Gauge Breacher: U.S. Army Evaluation Center (AEC), Aberdeen Proving Ground, MD. Report #: 10828421. DTIC ADB264957.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

191000 - Ballistics

Descriptors:

(U) \*WEAPONS, \*ACCEPTANCE TESTS, \*REQUIREMENTS, \*OPERATIONAL EFFECTIVENESS, \*BALLISTICS, PRODUCTION, SURVIVABILITY, ARMY PERSONNEL, DEMONSTRATIONS, SYSTEMS ANALYSIS, TEST FACILITIES, ADDRESSING, FRANGIBLE

Identifiers:

(U) \*GAUGE BREACHER

**System Description:**

The 12 Gauge Breacher is used for ballistic breaching of interior doors in urban terrain. It can be used with 2 3/4 and 3-inch chambered 12 gauge shotguns. It is designed for a single shot breach of locked interior doors. The cartridge is made with a frangible material that is expelled from the shotshell case to defeat door locks, hinges, and frames. The material does not produce fragments that can injure the soldier or people on the inside of the door.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Shotgun- Cartridge- 12 Gauge- NLA

**Reference** (Cross et al., 2000):

Cross, M., Byrne, J., Cole, H., Zelik, H., & Green, T. (2000). System Evaluation Report (SER) for the 12 Gauge Shotgun Non-Lethal Ammunition: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 00908224. DTIC ADB252056.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

Descriptors:

(U) \*ARMY EQUIPMENT, \*SHOTGUNS, TEST AND EVALUATION, OPERATIONAL EFFECTIVENESS, AMMUNITION, SYSTEMS ANALYSIS, NONLETHAL WEAPONS

Identifiers:

(U) NLA(NON-LETHAL AMMUNITION)

**System Description:**

Under the Soldier Enhancement Program, efforts are being made to provide the Army with non-lethal rounds for the 2.75- and 3.0-inch chambered 12 Gauge shotgun systems. The 12 Gauge NLA program has two cartridges. The first is designed for use against point targets, the second for use against area targets. These rounds will provide crowd control function against both individuals (point fire (PF)) or small groups (area fire (AF)) utilizing a kinetically delivered mode of incapacitation. The rounds are compatible with all standard 2.75- and 3-inch chambered 12 Gauge shotguns. The PF cartridge is a fin-stabilized rubber projectile. The AF cartridge contains 18 rubber balls that separate into a traditional shotgun pattern. Both are designed to provide a non-lethal capability for U.S. soldiers to use in Stability and Support Operations (SASO).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- SICPS-CPP

**Reference** (Benedict and James, 2003):

Benedict, J., & James, K. (2003). System Evaluation Report (SER) for the Standardized Integrated Command Post System - Command Post Platform (SICPS-CPP) Milestone B: U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB295815.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*MILITARY FACILITIES, COMMAND CONTROL COMMUNICATIONS, MILITARY OPERATIONS, DEPLOYMENT, SHELTERS, MILITARY VEHICLES, DISPLAY SYSTEMS, PLATFORMS, TRAILERS, SYSTEMS ANALYSIS, TENTS, TACTICAL WARFARE, RECONNAISSANCE, MECHANIZATION

Identifiers:

(U) \*SICPS(STANDARDIZED INTEGRATED COMMAND POST SYSTEM), \*COMMAND POSTS, CPP(COMMAND POST PLATFORM), C4ISR(COMMAND CONTROL COMMUNICATIONS COMPUTERS INTELLIGENCE SURVEILLANCE AND RECONNAISSANCE)

**System Description:**

SICPS CPP, as an umbrella program, consists of four individual systems, including the SICPS CPPs, the SICPS Family of Tents, the SICPS B-Kit, and the CLCS. The SICPS CPPs include three variants (RWS, or RWS CPP; Light CPP; and Track CPP) installed on prime movers. CPPs support the operational needs of the Current (Mechanized and Light) and SBCT Forces, with direct applicability to the Future Force. CPPs will be capable of operations at the halt and quick halt. Individual operator positions are removed from the platform into a tent or larger facility. This capability of enabling operators to perform their duties in a tent or larger facility away from the platform provides a more open workspace while enhancing staff coordination. Selected CPPs will have one operator position capable of operation during displacement to enable monitoring the COP for situational awareness. For the RWS CPP and Light CPP, this position is in the vehicle cab.

The three CPP variants, which are all C-130 deployable, are designed to best meet the mobility and workspace needs of each echelon of command and type of force. The RWS CPP and Light CPP are enclosures/platforms that are mounted on the different variants of the LTV: the RWS CPP is expected to be mounted on the M113 and the Light CPP is expected to be mounted on the M1097 or M1037. The Light CPP will also be capable of being sling-loaded by UH-60L helicopter as well as being air droppable by transport aircraft. The Track CPP transforms the M577/1068 Command Track into a CPP through the addition of an IK. Each prime mover is GFE to the SICPS CPP program.

The SICPS CPP is primarily a non-developmental effort that consists of the integration of multiple fielded ABCS/GCSS-A and other C4ISR systems (GaTS and COTS) technology into platforms. SICPS provides a LAN infrastructure, both at the Classified and Unclassified levels (to which other computers can connect) with connectivity to Army, Joint, and Coalition North Atlantic Treaty Organization tactical communications networks. The Command Post Communications System, an intercom for maneuver brigades (to include Field Artillery), Division, and Corps CPs, allows point-to-point communications and conferencing among all operators in the CP and provides operator access to any voice radio in the CP. An LSD and its associated video controller supports enhanced collaborative staff functions.

The SICPS CLCS provides a sheltered workspace mountable on the LTV and is capable of supporting the installation of Army standard C2 equipment (i.e., tactical radios, Force XXI Battle Command, Brigade and Below (FBCB2), etc.). The CLCS is designed to meet the CP requirements of SBCT RSTA troops. The SICPS Family of Tents will be a series of quickly erected tents in various sizes (Small, Medium, and Large) designed to be used either in a stand-alone mode or connected to another SICPS tent and/or CPP. Modular by design, they will be connectable end-to-end, side-to-side, or side-to-end. SICPS tents will be employed with the operational facilities of CPs to provide workspace, power distribution, lighting, environmental conditioning (heating and cooling on a trailer support system), tables, lightweight/integrated flooring, cable management system, and a common grounding system. The Small Tent is currently in the inventory. The Medium and Large tents are being developed by PM FSS for PM TOCs, using the SICPS CPP ORD as the requirement. Medium and Large tents include wiring, lighting, etc. as well as a trailer, ECU, and APU.

The SICPS B-Kit will be fielded to select Command Post Platforms to support Combat Information Center (CIC) operations. The primary component of the B-Kit is an information display (including one or more LSDs) that supports collaborative staff functions. The LSD, along with the associated video switch/controller and audio system, allows the commander and staff to simultaneously view the COP, employ collaborative tools, and directly monitor various feeds from sensors or news services to gain situational awareness/understanding. The Battle Captain will control the inputs to the display and will be capable of displaying multiple video and computer input simultaneously.

The various CPPs can rapidly combine with the SICPS Family of Tents to form an open environment for the commander and staff geared to the specific requirements of the unit's mission and echelon. When grouped together to form a larger CP, centralized power plants may be necessary (especially as prolonged usage of APUs may produce toxic fumes). Commanders and staffs at echelons of company (SBCT force) through Army will use SICPS platforms. SICPS platforms comprising CPs will be found throughout the battlefield ranging from the maneuver battalion Area of Operations (AO) through the Corps Rear Area.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- SIIRCM

**Reference** (Prather et al., 2003):

Prather, M., Swiger, A., Mobley, K., Rigler, L., & Neely, C. (2003). System Evaluation Report (SER) for the Suite of Integrated Infrared Countermeasures (SIIRCM): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 31718830. DTIC ADC070192. Report Classification: SECRET. Citation Classification: Unclassified.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

170404 - Optical Countermeasures

Descriptors:

(U) \*INFRARED COUNTERMEASURES, TEST AND EVALUATION, GUIDED MISSILES, INTEGRATED SYSTEMS, CONTROL SYSTEMS, DETECTORS, ACQUISITION, PRODUCTION, ELECTROOPTICS,

THREATS, ATTACK, ELECTRONIC EQUIPMENT, ARMY EQUIPMENT, CARGO, AMMUNITION, PROTECTION, JAMMING, SYSTEMS ANALYSIS, AUTOMATIC, LOW RATE, DISPENSERS, WARNING SYSTEMS

**System Description:**

(U) SIIRCM is designed to detect, declare, and jam/decoy inflight infrared missiles. It provides automatic protection for U.S. Army attack, utility, cargo, and special operations aircraft against Tier 1 IR-guided (heat-seeking) threat missile systems. The SIIRCM system consists of the Advanced Infrared Countermeasure Munitions (AIRCMM) and the Advanced Threat Infrared Countermeasures (ATIRCM), which includes the CMWS, SIIRCM Jammer, and the Improved Countermeasures Dispenser (ICMD). The CMWS contains an electronic control unit (ECU) and Electro-Optic Missile Sensors (EOMS). The SIIRCM Jammer consists of the infrared Jam Head (IRJH), the Jam Head Control Unit (JHCU), and the Infrared Jam Laser (IRJL).

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- SKA-CAA XM279

**Reference (Hunter, 2000):**

Hunter, L. (2000). System Evaluation Report (SER) for the Sampler Kit, Air (Ska): Chemical Agent Alarm (Caa), Xm279: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 02708303. DTIC ADB258498.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

150603 - Chemical, Biological and Radiological Warfare

Descriptors:

(U) \*CHEMICAL AGENT DETECTORS, \*WARNING SYSTEMS, TEST AND EVALUATION, ACCEPTANCE TESTS, SURVIVABILITY, SYSTEMS ANALYSIS, SAMPLERS

Identifiers:

(U) SER(SYSTEM EVALUATION REPORT), XM279 ALARM, USER DEMONSTRATION

**System Description:**

Forces opposing the United States have a near all-weather ability to contaminate personnel, materiel, and terrain with chemical agents. To effectively counter this chemical agent threat, the U.S. Armed Forces require a man-portable, automatic chemical agent alarm system. In the chemical agent monitoring survey role, the system is required to determine if the area being monitored/surveyed is contaminated.

Accordingly, the system will be used as an auxiliary component to supplement the M22 Automatic Chemical Agent Detector Alarm (ACADA). The XM279 shall be capable of vaporizing liquid deposits adsorbed on surfaces or terrain and transporting the vapor to the M88 detector for analysis. Support of the system will be supplied through the existing logistics system, and the system will be operable by soldiers of any military occupational specialty (MOS) with minimal specific training.

Key Features. The XM279 will be an auxiliary component of the M22 ACADA. It is a Pre-Planned Product Improvement (P3I) program. The market survey conducted for the M22 ACADA program documented that if the M22 system was to be procured as a NonDevelopmental Item, the XM279 would have to be procured separately. System requirements from the TEMP of the XM279 and the ACADA Operational Requirements Document (ORD) include:

- Sampling various surfaces and terrain for deposited chemical liquids.
- Transference of the chemical in vapor state to the M22.
- Provide any and all power, pneumatic, and interfacing hardware required for operation of the XM279.
- No degradation of performance of the M22.

- Capability of the system to operate in ambient atmosphere or inside Collective Protection Equipment (CPE) environments.
- Capability of the system to notify the operator of faults or operational status (built-in test).
- The system will require no unique training concepts, logistical support concepts, maintenance concepts, or any new MOS for operation.

Critical Interfaces. The XM279 shall interface with the M22 ACADA. No other system is planned to interface with the XM279; however, it should be possible for other systems (i.e., Chemical Agent Monitor/Improved Chemical Agent Monitor (CAM/ICAM) and Joint Chemical Agent Detector (JCAD)) to use the XM279.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- SMART-T

**Reference** (Rahman et al., 2002):

Rahman, M., Heuckeroth, O., Borrero, E., Andrulonis, R., Gonzales, B. P., Jones, M., Thompson, P., & Wierworka, T. (2002). System Evaluation Report (SER) for the Secure, Mobile, Anti-Jam, Reliable, Tactical Terminal (SMART-T): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC. Alexandria, VA.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

120500 - Computer Programming and Software

170401 - Radio Countermeasures

Descriptors:

(U) \*SOFTWARE ENGINEERING, \*RADIO ANTIJAMMING, MILITARY FORCES(UNITED STATES), ARMY EQUIPMENT, SYSTEMS ANALYSIS, ELECTRONIC COUNTERMEASURES, DOWNLINKS, ELECTRONIC SUPPORT MEASURES, COMPUTER PROGRAM RELIABILITY, COMMUNICATION TERMINALS, COMPUTER VIRUSES

Identifiers:

(U) EXPORT CONTROL, SMART-T(SECURE MOBILE ANTIJAM RELIABLE TACTICAL-TERMINAL)

**System Description:**

SMART-T provides range extension capability to the MSE through the MILSTAR II Medium Data Rate (MDR) satellite. It is designed to provide anti-jam, low probability of intercept/low probability of detection (LPI/LPD), secure voice and data capabilities at Echelon Corps and Below (ECB). The terminal will eventually replace the AN/TSC 85 and 93 at Division and Corps. The AN/TSC 85 and 93 are at their 15-year life cycle. In addition, they are expensive to operate and maintain, and they do not have anti-jam and LPI/LPD capability. For these reasons, the SMART-T is a critical component to the future Army Satellite Communication Architecture.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Smoke Pot M8

**Reference** (Grady and Charles, 1998):

Grady, E., & Charles, S. (1998). System Assessment (SA) for the M8 Smokepot: U.S. Army Evaluation Analysis Center., Aberdeen Proving Ground, MD 21005-3013. DTIC ADB238724.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

190101 - Pyrotechnics

Descriptors:

(U) \*TEST AND EVALUATION, \*SMOKE, \*SYSTEMS ANALYSIS, PRODUCTION, DEGRADATION, MATERIALS, LIMITATIONS, RELEASE, BIOLOGICAL WARFARE AGENTS, CHEMICAL WARFARE AGENTS

Identifiers:

(U) PPOT(PRE PRODUCTION QUALIFICATION TEST), PVT(PRODUCTION VERIFICATION TEST), SMOKE POT

**System Description:**

The M8 is a smoke pot designed to be less toxic than the standard M4A2 smoke pot. The M8 is a modified M4A2 smoke pot created by replacing the existing carcinogenic and toxic mixture, hexachloroethane (HC), with a safer and less toxic training smoke composition, terephthalic acid (TA). When burned, HC produces toxic fumes which pose a health risk to troops exposed to its smoke. TA has been identified by the US Army Chemical and Biological Defense Command (CBDCOM) as a safer training smoke formulation. TA has lower toxicity, functions without a visible flame, and is intended to provide adequate screening properties for the training environment. The M8 training device will be used for training troops to operate in smoke environments. The M8 Smoke Pot is required to be similar in size and weight to the currently fielded M4A2 smoke pot and will operate identically. Although the TA-filled device has a shorter total burning time and, therefore, produces a smaller total smoke cloud volume, the user is willing to accept these differences as long as the obscuration capabilities are the same during that shorter time interval. The M8 is filled with 29 pounds of smoke mixture. The M207A1 standard smoke pot fuze initiates a pyrotechnic delay train which ignites a starter mixture which in turn initiates the M8 smoke mixture, similar to the M4A2. In its solid state, HC is a carcinogen. This causes manufacturing concerns which translate into higher production costs. HC is not currently available in North America.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Sorbent

**Reference** (Jernigan et al., 2002):

Jernigan, R., Chipman, M., Fuller, J., Kocher, T., & Morris, J. (2002). System Evaluation Report (SER) for the Sorbent Decontamination System (SDS): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 32338857. DTIC ADB291440.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

150603 - Chemical, Biological and Radiological Warfare

Descriptors:

(U) \*DECONTAMINATION EQUIPMENT, \*ADSORBENTS, TEST AND EVALUATION, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, ABSORBERS(MATERIALS)

Identifiers:

(U) SDS(SORBENT DECONTAMINATION SYSTEM)

**System Description:**

The SDS is being developed as a potential replacement for the MII Decontamination Apparatus (DA). The SDS provides users the capability to perform immediate decontamination of chemical warfare agent (CWA) liquid depositions. The SDS kit consists of two packages, each containing one applicator mitt and one 300-gram pack of reactive, adsorptive powder designed to adsorb, remove, or neutralize CWAs on 12.5 square meters of contaminated surface. The sorbent powder is a highly porous sodium aluminosilicate mixed with carbon to add color. The SDS case is approximately the same size as the cylinder-shaped MII DA that it is designed to replace. The optional mounting bracket has the same mounting hole configuration as the bracket for the MII DA.

The SDS contains a free-flowing, reactive, highly adsorptive powder, designed to provide users the capability to perform immediate decontamination of chemical warfare agent (CWA) liquid depositions without using water. The SDS kit consists of one rectangular-shaped case containing two decontamination packages that is securely closed with two case closure straps. Each decontamination package contains one applicator mitt and one bag filled with 300 grams of sorbent powder. The sorbent powder is a highly porous sodium aluminosilicate that is physically mixed with carbon (five percent by weight) to add color. The SDS case is approximately the same size as the cylinder-shaped MII DA that it is designed to replace. The SDS also has an optional mounting bracket. The bracket has the same mounting hole configuration as the bracket for the MII DA. The SDS will be carried on all combat vehicles, crew-served weapons, and aircraft for immediate decontamination of individual equipment and weapon systems. The SDS will adsorb, remove, or neutralize CWAs from contaminated areas of equipment. The SDS will include application hardware and enough sorbent powder to complete one immediate decontamination without resupply.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Suit- Protective- JSLIST P3I

**Reference** (Beran et al., 2001):

Beran, G., Hunter, L., Holman, C., Dunn, N., Finanger, K., Fuller, J., Myers, J., Hannah, L., Kocher, T., Hall, J., Ramirez, R., Hay, L., Walker, R., Scarlett, M., Givens, C., Webster, C., Eaton, H., & Pierce, E. (2001). System Evaluation Report (SER) for the Joint Service Lightweight Integrated Suit Technology (JSLIST) Pre-Planned Product Improvement (P3I): U.S. Army Evaluation Center (AEC), Aberdeen Proving Ground, MD. Report #: 10678409. DTIC ADB264165.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

150603 - Chemical, Biological and Radiological Warfare

230400 - Protective Equipment

Descriptors:

(U) \*PROTECTIVE CLOTHING, \*COLLECTIVE PROTECTION, NUCLEAR WARFARE, LAND WARFARE, MILITARY STRATEGY, COMBAT SUPPORT, OPERATIONAL EFFECTIVENESS, AERIAL WARFARE, JOINT MILITARY ACTIVITIES, LIGHTWEIGHT, BIOLOGICAL WARFARE AGENTS, DECISION AIDS, CHEMICAL WARFARE AGENTS, HEAT STRESS(PHYSIOLOGY), SPECIAL OPERATIONS FORCES

Identifiers:

(U) JSLIST(JOINT SERVICE LIGHTWEIGHT INTEGRATED SUIT TECHNOLOGY), P3I(PRE PLANNED PRODUCT IMPROVEMENT), CPU(CHEMICAL PROTECTIVE UNDERGARMENT)

**System Description:**

The JSLIST P3I ensembles were designed to provide individuals with state-of-the-art protection against liquid, vapor, and aerosol chemical and biological agents, and radioactive dust particles by encapsulating users in a protective ensemble while simultaneously reducing heat strain and improving mission performance endurance periods compared to current protective garments. The ensemble consists of standard masks/boots and a candidate two-piece garment with an integral hood (except for the Special Operations Forces (SOF) garment, which has no hood), socks, and undergarment. The ensembles must be suitable for individuals to wear while performing mission-essential tasks in all weather conditions and combat situations. When ensembles are worn with the appropriate protective mask, they will provide protection to all areas of areas of the body during mission activities. The garments and socks must remain effective after laundering every 7 days up to the maximum design wear life (7-day garments [not laundered], 30-day garment [4 laundering], 45-day garment [6 laundering] and 60-day garment [8 Laundering]).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- TACLANE

**Reference** (Bristow et al., 2002):

Bristow, S., Wieworka, T., Bailey, R. C., Karwowski, C., Bruder, B., Robinson, J., Vincent, M., Captain, M., Jones, H., III, Doyle, K., & Manasco, C. (2002). System Assessment (SA) for the TACLANE KG-175 in-Line Network Encryptor: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report # 21548659.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

**System Description:**

The KG-175 TACLANE INE is an Internet Protocol/Asynchronous Transfer Mode In-Line Network Encryptor (IP/ATM INE) device developed by General Dynamics Communication Systems for the National Security Agency (NSA). This device supports secure transfers of both ATM cell and IP datagram traffic for tactical and strategic network applications. The tactical internet uses the Transmission Control Protocol/Internet Protocol (TCP/IP) networking protocols. Currently the only Type 1 IP encryptor used by the U.S. Army is the Network Encryption System (NES). Demand for INE security services in the tactical environment is so strong that customers have been using NBS, designed for an office environment, in tactical deployments. The Combat Service Support (CSS) community uses NBS to provide cryptographic separation between data systems at two different levels of security. TACLANE will fill the Army's need for an INE communications network.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- TC-AIMS II

**Reference** (Maddux et al., 2004):

Maddux, A. W., Everton, M. S., Newman, L., Johnson, C., Townsend, K., McCormick, J. E., Adamo, L., Gattoni, R., Gattoni, B., & Addai, W. (2004). System Evaluation Report (SER) for the Transportation Coordinators' - Automated Information for Movements System II (TC-Aims II): U.S. Army Test and

Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC,  
Alexandria, VA. Report #: 40768931 / 2003-LU-C4-TCAIM-A1202. DTIC ADB296834.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

050200 - Information Science

150500 - Logistics, Military Facilities and Supplies

150600 - Military Operations, Strategy and Tactics

Descriptors:

(U) \*INFORMATION SYSTEMS, \*INFORMATION RETRIEVAL, \*MILITARY PLANNING, \*MILITARY  
TRANSPORTATION, AUTOMATION

Identifiers:

(U) TC AIMS(TRANSPORTATION COORDINATOR'S AUTOMATED INFORMATION FOR  
MOVEMENTS SYSTEM)

**System Description:**

As a result of the Joint Transportation Corporate Information Management Study in the mid-1990s, the Joint Project Management Office (JPMO) was formed to use the "best practices" of the 149 legacy systems reviewed for developing the TC-AIMS II system. The Services and Joint agencies identified over 3,000 unique requirements, but did not address a common process or database to be used. The JPMO reviewed the myriad of Service/Joint processes and developed the modular concept (i.e., Asset Management, Movement Planning, Coordination and Execution) for TC-AIMS II to meet the Block 2 requirements of supporting Unit Movements and the CJCS 72-hour TPFDD process for all Services. TC-AIMS II Block 2 is designed to provide timely and accurate information to plan, coordinate, and execute unit movements by air, ground, and sea transportation to the right place at the right time (see figure 1-2). TC-AIMS II Block 2 will be operated and maintained by Soldiers, Sailors, Marines, and DOD civilians as transportation users, coordinators, and system administrators at unit and installation levels. It will exchange movement plans and information with a variety of Service and Joint systems via commercial and defense communications, Internet, or by floppy disk to support the in-transit visibility (ITV) of personnel, equipment, and cargo movement into the Defense Transportation System (DTS). TC-AIMS II Block 2 operates in four configurations: in garrison on a local area network (LAN), via Web-access through an Enterprise Management System, deployed on a LAN, or as a stand-alone laptop computer and will be used by Active, Reserve, and National Guard units in peace and war for mobilization, deployment, and redeployment.

**a. Service Unit Move Processes.** It is important to note that during the preparation for the TC-AIMS II Block 1 Initial operational Test (IOT) and Block 2 LUT, ATEC conducted a front- end analysis of the unit movement business processes used by each Service. This analysis found that the Services historically have used (and continue to use) their own unique business processes to plan and execute unit moves; and, there is no common Joint unit move process (see figure 1-3). ATECs assessment of the lack of a common Joint unit move process, coupled with the lack of Joint transportation databases built on common data elements, will increasingly plague TC-AIMS II system development as additional functionality is added in future blocks. In Block 1, ATEC identified the fact that there is no agency empowered to serve as the single user representative to clarify system requirements for the JPMO or enforce priorities for development. U.S. Joint Forces Command (JFCOM) was designated as the Single User Representative, but not in time to affect Block 2 development.

**b. Unit Move CMFs.** During the front-end analysis, ATEC determined that a total of 16 fundamental major functions that must be accomplished by all Services in order to plan, coordinate, and execute movement of the right personnel, equipment, and cargo via the required modes of transportation from Point A to Point B. Each Service may use different terminology and do the functions in a slightly different order. Still, they must be performed to move a unit where they need to go. These are the unit movement CMFs. Figure 1-4 provides a diagram outlining the nominal flow of the 16 unit move CMFs. It is important to note that the TC-AIMS II Block 2 system is only required to provide 13 of the 16 total CMFs (#1 through #13). The last three CMFs (in-check personnel, in-check equipment, and report discrepancies) which provide feedback to ensure personnel and equipment arrived, were partially delivered with the Block 2 system, but unused by the Services.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- TPIAL

**Reference** (Britton et al., 2000):

Britton, D., Jones, T., Fendick, K., Myers, J., & Winters, J. (2000). System Evaluation Report (SER) for the AN/PEQ-2 Target Pointer/Illuminator/Aiming Light (TPIAL): U.S. Army Evaluation Center (AEC), Aberdeen Proving Ground, MD. Report #: 10328372. DTIC ADB262787.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

170500 - Optical Detection and Detectors

Descriptors:

(U) \*LASER TARGET DESIGNATORS, \*NIGHT VISION DEVICES, \*MOUNTING BRACKETS, TEST AND EVALUATION, TARGET ACQUISITION, ILLUMINATION, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, IMAGE INTENSIFICATION, COMMERCIAL EQUIPMENT, VISUAL SURVEILLANCE, NIGHT RECONNAISSANCE

Identifiers:

(U) EXPORT CONTROL, TPIAL(TARGET POINTER ILLUMINATOR AIMING LIGHT), AN/PEQ-2A

**System Description:**

The TPIAL is a Non-Developmental Item (NDI) that consists of a commercially available laser target pointer and illuminator device intended to be used in conjunction with image intensification systems such as night vision goggles and the monocular night vision device to conduct reconnaissance, surveillance, and target acquisition. It can be mounted on a host weapon system using a mounting bracket and the standard U.S. Army rail. The mounting bracket consists of a RG and appropriate spacers. (Mounting the TPIAL on the M249 weapon requires a modified feed tray cover.) The TPIAL can project two parallel infrared beams. A capability to illuminate targets or other areas of interest is provided by one beam. The second infrared beam can be used as a weapon mounted aiming light or as a handheld pointer to provide improved tactical command and control. The illumination and aiming light beams can be operated individually or in combination, with a maximum range of 2,000 meters. The TPIAL is a sealed unit, which requires only operator's maintenance (cleaning, battery changes and replacement of covers and filters). With the exception of operator maintenance, the system is nonreparable.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Uniform- ACU

**Reference** (Loew et al., 2004):

Loew, M. R., Farquhar, J., Zwicke, R., Krausman, A., Pieper, B., Finkel, M., Pierson, J., & Craig, D. (2004). System Assessment (SA) for the Army Combat Uniform (ACU): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB300670.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*UNIFORMS, SURVIVABILITY, ARMY PERSONNEL, ENDURANCE(GENERAL), LIGHTWEIGHT, PROTECTIVE CLOTHING

Identifiers:

(U) EXPORT CONTROL, \*COMBAT UNIFORM

**System Description:**

The ACU System is the title of an over-arching acquisition capstone program approach to improve the Army's Combat Clothing System. The CU is one of four sub-components of that capstone program. The other sub-components of the ACU not included in this evaluation are Inner Environmental Layer (IEL) (undergarments), Outer Environmental Layer (wet/cold weather gear), and the Outer Battle Layer (ballistics protection). The CU is made of the same material as the currently fielded BDU. There are several differences between the CU and the BDU; (1) The collar of the CU is more of a 70's style collar than the current BDU; (2) The CU blouse is a shorter cut than the current BDU; (3) the CU has a drawstring for waist adjustments' and the BDU has the metal fasteners; (4) the CU blouse has a zipper and Velcro for closure and the BDU has buttons; (5) the CU has changed the positioning and location of some of the pockets. All changes were focused on making the uniform more practical when used in conjunction with OCIE items.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Crew- MSS

**Reference** (Barker et al., 2007):

Barker, J., Kleist, E., Sheng, S., Juba, A., Lloyd, T., Beran, G., Campbell, S., Jones, W., Gahler, C., Garrett, C., Addison, C., Bailey, J., & Spencer, J. (2007). System Evaluation Report (SER) for the Mounted Soldier System (MSS) in Support of a Milestone B Decision: U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB332272.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

150100 - Military Forces and Organizations

190300 - Combat Vehicles

Descriptors:

(U) \*MILITARY REQUIREMENTS, \*ARMY PERSONNEL, \*COMBAT VEHICLES, TEST AND EVALUATION, SITUATIONAL AWARENESS, NETWORK CENTRIC WARFARE, RISK ANALYSIS, COMMAND AND CONTROL SYSTEMS, SURVIVABILITY

Identifiers:

(U) \*MSS(MOUNTED SOLDIER SYSTEM), RISK ASSESSMENT

**System Description:**

The MSS will provide combat vehicle crewmembers and platoon commanders with increased mission effectiveness on the network centric battlefield in the areas of command and control (C2), situational awareness (SA), communications, force protection, survivability, mobility, and sustainability. The MSS provides the combat vehicle commander increased capabilities to conduct offensive and defensive operations. The MSS will equip all Combat Vehicle Crewman (CVC) (including Abrams, Stryker, Bradley, Paladin, and Future Combat Systems (FCS) platforms) and selected Maneuver Support and Maneuver Sustainment Soldiers who perform mounted missions. Currently, the MSS is broken down into four subsystems.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Fuel- FSSP

**Reference** (Ingram, 2007):

Ingram, D. (2007). System Evaluation Report (SER) for the Fuel System Supply Point (FSSP) Type 5-800k / Abbreviated (ASER): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB327698.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

210400 - Fuels

Descriptors:

(U) \*FUEL SYSTEMS, TEST AND EVALUATION, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, FUEL TANKS, SYSTEMS ANALYSIS

**System Description:**

The FSSP is the Army's primary means for the receipt, storage, and issuance of bulk petroleum for combat forces under tactical conditions. The FSSP consists of five standard configurations, each distinguished by its storage capacity as follows: Type 1-30K, Type 2-60K, Type 3-120K, Type 4-300K, and Type 5-800K. Each system includes collapsible fabric storage tanks of various sizes; a 350 GPM or 600 GPM pump, filter separators, fittings, and hoses. The systems are containerized in International Organization of Standards (ISO) compatible modules. Each FSSP has the capability to receive, store, segregate, and issue fuel at the retail and wholesale level. In addition to the bulk fuel storage requirement, the FSSP has the capability to issue fuel into bulk containers such as 500-gallon collapsible drums or fuel tankers. Additionally, the FSSP has the capability to disperse fuel as a retail product directly into using vehicles.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Teleoperation- VTC

**Reference** (Hadjiosif et al., 1997):

Hadjiosif, L., Gage, H., Swiger, A., Maxey, G., Hannah, T., White, D., & Padgett, D. (1997). System Evaluation Report (SER) for the MS I/II for the Vehicle Teleoperation Capability (VTC): U.S. Army Test and Evaluation Command (ATEC) (Formerly U.S. Army Operational Test and Evaluation Command-OPTEC), ATTN: CSTE-EAC-CC, Park Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB228948.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

120900 - Cybernetics

230200 - Human Factors Engineering & Man Machine System

190300 - Combat Vehicles

Descriptors:

(U) \*ROBOTICS, \*MAN MACHINE SYSTEMS, \*TANKS(COMBAT VEHICLES), TEST AND EVALUATION, OFF THE SHELF EQUIPMENT, OPERATIONAL EFFECTIVENESS, MINE CLEARANCE, SYSTEMS ANALYSIS, REMOTE CONTROL

Identifiers:

(U) TELEOPERATION TECHNOLOGY, VTC(VEHICLE TELEOPERATION CAPABILITY)

**System Description:**

The VTC is an unmanned teleoperated system, which includes a teleoperated kit that can be installed on various platforms. These platforms will carry the normal payloads required for the mission. The VTC program utilizes the STS as its core teleoperation capability. The STS is manufactured by Omnitech Robotics Incorporated (ORI) and it consists of modular components for converting any vehicle to remote control, teleoperated control, or semi-autonomous control. The STS is a generic control system and can be applied to both ground vehicles and watercrafts. The main components of the STS are an operator control unit (OCU), a vehicle control unit (VCU), high integration actuators (HIA), a system input/output (SIO) device, a video transmitter unit (VTU) and a pan/tilt unit (PTU) and front and rear cameras. The STS controls and provides mobility control for the vehicle by manipulating the vehicle's starting and stopping, braking, steering, throttle, and gear shifting functions as commanded by the remote operator.

a. The operator controls the vehicle remotely by watching live video transmitted from onboard cameras and monitoring feedback from the vehicle's speedometer, tachometer, and other essential status gauges. Both video and the status information are displayed on the OCU simultaneously in real time to give the operator the information and data/status for teleoperation.

b. The STS kit allows the vehicle to be used in a manned mode at any time or to be converted to teleoperated control by manipulating a minimal number of switches. The STS provides several safety features that enhance the safety of remote control vehicle operations. The STS comes to a safe configuration if the radio communications between the OCU and the on-board systems are lost or disrupted, or if any of the safety-critical equipment on board the platform malfunctions. A "Panic Stop" button is provided on the OCU for the operator to initiate a stop with a single, simple action should the operator ever lose control or suspect problems. The STS also comes with an independent data link safety radio system that can be used to provide emergency stop capability that overrides all STS commands. The safety radio itself can be overridden by the operator prior to the start of remote operations if so desired.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Tracked- Bulldozer- DEUCE-CPK

**Reference** (Rajkowski, 2003):

Rajkowski, E. (2003). System Assessment (SA) for the Limited Procurement Decision for the Deployable Universal Combat Earthmover-Crew Protection Kit (DEUCE-CPK) / Abbreviated: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report # 30738794.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

**System Description:**

The DEUCE is the tactical earthmover that replaced the D5 bulldozer in Light-Infantry and Airborne Divisions. The DEUCE weighs approximately 35,500 pounds and is designed to meet the mobility and transportability requirements and capabilities of Light Divisions. The DEUCE is equipped with a hydraulic-powered, six-way angle/tit blade and a rear-mounted hydraulic winch. It has a dual-mode suspension

system-a self-deployed mode for smooth operation on paved highways and a locked mode for a stable base when conducting dozing operations. It can achieve speeds of over 30 miles per hour on highway in the self-deployed mode. The highway travel capability is achieved by the use of a continuous, rubber-track system.

The CPK is designed to provide protection to the DEUCE operator from 7.62-mm Armor Piercing Incendiary (API) rounds. Steel components of the standard DEUCE cab, including the floor, were replaced with aluminum armor plate, and glass windows were replaced with transparent polycarbonate. The CPK weighs approximately 1,500 pounds more than the standard cab. It is designed to be physically and functionally interchangeable with the standard cab.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Tracked- Engineer- HYEX

**Reference** (Dillen et al., 2000):

Dillen, M., Stevens, J., & Knuckles, S. (2000). System Evaluation Report (SER) for the Hydraulic Excavator (HYEX): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA DTIC ADB253700.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

130900 - Machinery and Tools

200400 - Fluid Mechanics

Descriptors:

(U) \*ENVIRONMENTAL TESTS, \*HYDRAULICS, \*EXCAVATION, \*ROCK DRILLING, TEST AND EVALUATION, MATERIEL, IMPACT, MODELS, ENERGY, ROCK, TRANSPORTABLE, DIRT, RELEASE, SYSTEMS ANALYSIS, AIR CONDITIONING EQUIPMENT, SUSPENSION DEVICES, SUPPLIES, ARMY, HEAVY DUTY, DRILLING, SEATS, PNEUMATIC EQUIPMENT

Identifiers:

(U) EXPORT CONTROL, HYYEX(HYDRAULIC EXCAVATOR)

**System Description:**

a. Type I. The Type I HYEX consists of a model 230LCR John Deere machine powered by a 414-cubic-inch diesel engine. The HYEX can be equipped with either a heavy-duty dirt bucket with a hydraulic thumb clamp or a utility bucket. The operator's cab is totally enclosed and equipped with heating and air conditioning and a suspension seat for comfort.

b. Type II. The Type II HYEX consists of a model 230LC-RD John Deere machine that is identical to the Type I model except that it can also be equipped with a Montabert rock drill and a rear-mounted Ingersoll-Rand air compressor to supply pneumatic energy to the rock drill.

c. Type III. The Type III HYEX consists of a model 330LCR John Deere machine powered by a 494-cubic-inch diesel engine. The HYEX can be equipped with a heavy-duty dirt bucket, a rock bucket, or a hydraulic impact breaker. The operator's cab is totally enclosed and equipped with air conditioning and a suspension seat for comfort.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Tracked- Engineer- HYEX

**Reference** (Mikolinis, 2007):

Mikolinis, T. E., Sr. (2007). System Evaluation Report (SER) for the Hydraulic Excavator (HYEX), Crawler Mounted, Type I / Abbreviated (ASER): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB334826.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

130300 - Construction Equipment, Materials & Supplies

Descriptors:

(U) \*TEST AND EVALUATION, \*EXCAVATION, \*EARTH HANDLING EQUIPMENT, ARMOR, SURVIVABILITY, KITS, HYDRAULIC EQUIPMENT, COMPARTMENTS, PROTECTION

Identifiers:

(U) \*HYEX(HYDRAULIC EXCAVATOR), CRAWLERS

**System Description:**

(1) The HYEX Type I is a crawler mounted, hoe type, diesel engine driven excavation machine. The HYEX has an upper structure capable of continuous 3600 rotation, which digs, elevates, swings, and dumps material by action of the boom, the arm, and the bucket. It is transportable by C-5 / C-17 aircraft, and has quick connect/disconnect attachment capability. The HYEX Type I consists of a 1.5-cubic yard Heavy Duty Bucket and a 1.33-cubic yard utility bucket, and ditching bucket with hydraulic thumb clamp that is capable of use with all bucket configurations. When specified, the HYEX type I will include a 20-foot long deep digging attachment arm, hydraulic impact breaker, hydraulic driven plate compactor, crushing attachment, and barrier grapple.

(2) The HYEX Type I will have the following military unique requirements:

- Military Lifting and tie down provisions (MIL-STD-209).
- NATO Slave Connector, 24 Volt System.
- Bracket Assembly, Rifle Stowage.
- Chemical Agent Resistive Coating paint (tan or green).
- Armored Crew Protection Kit (CPK).
- High-Altitude Electromagnetic Pulse (HEMP) Resistance.

(3) The HYEX Type I will enhance the Future Engineer Force (FEF) Horizontal Companies, Multi-Roll Bridging Companies (MRBC), Pipeline Companies and supported forces in the area of combat support, combat service support, mobility, deployability, countermobility, and general construction missions. The HYEX will provide the Commander with the flexibility to accomplish many tasks, starting at initial entry into theater and well into conflict termination. It will provide the FEF the ability to repair and improve combat roads and trails, railroads, and airfields, to allow the speedy flow of personnel, supplies and equipment into and within theater. The HYEX will also provide the FEF with the capability to: rapidly repair and expand operating capacities of ports of embarkation, intermediate and forward staging bases, ports of debarkation; conduct rapid runway repair; initial base camp construction, repair, and maintenance of ground lines of communication; non-explosive area clearing; construction of tactical Unmanned Air Vehicle strips, helicopter and aircraft landing zones, and force protection. The HYEX will also be employed in support of reconstruction operations to: prepare/fill craters and potholes; clean, clear, repair drainage and drainage systems; clean, lift, crush, loading/dumping debris and rubble; loading/unloading various aggregates and raw materials; and digging trenches/ditches. It will replace outdated resources in the current force structure and fill shortfalls generated in the FEF restructuring.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

**System Short Name:** SER- Vehicle- Tracked- IFV- Bradley BFVS Linebacker M-6

**Reference (OPTEC, 1997):**

OPTEC. (1997). System Evaluation Report (SER) for the Bradley Linebacker Weapon System: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. HQ, OPTEC, Attn: CSTE-OEC-ADE, Park IV, Alexandria, VA 22303-1458. USAEC, APG, MD. DTIC ADC060293

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

150302 - Antiaircraft Defense Systems

190300 - Combat Vehicles

190500 - Fire Control and Bombing Systems

Descriptors:

(U) \*AIR DEFENSE, \*COMBAT EFFECTIVENESS, \*FIRING TESTS(ORDNANCE), \*SURFACE TO AIR MISSILES, \*ARMORED PERSONNEL CARRIERS, INTEGRATED SYSTEMS, ARMY RESEARCH, DECISION MAKING, STRATEGY, SURVIVABILITY, THREATS, BATTLEFIELDS, HUMANS, MAINTAINABILITY, RELIABILITY, INTEGRATION, TRANSPORTABLE, LOGISTICS, LETHALITY, SYSTEMS ANALYSIS, MANEUVERS, CONTAMINATION, FRATRICIDE

**System Description:**

The Linebacker, M-6, National Stock Number (NSN) 2350-01-448-0368 will provide US Army heavy armored maneuver forces with dedicated air defense against a variety of threat platforms. The M-6 Linebacker also provides improved crew survivability, increased mobility, improved target acquisition and night-fighting capabilities. The Linebacker is an upgrade to the existing Bradley Fighting Vehicle with the addition of the Linebacker modification system, FAADS Command, Control, Communications and Intelligence (C3I), and the Bradley ODS Kit. The Linebacker team consists of a four-man crew: commander, gunner, driver, and crew member to provide the primary means for fire support planning of various types for the US Army maneuver forces. The Bradley-Linebacker system allows the gunner to engage low-altitude, high-speed, fixed-wing and rotary-wing aircraft, cruise missiles, and unmanned aerial vehicles with Stinger missiles while remaining under armor. The Stinger system replaces or modifies components of the TOW system.

**Report Availability:**

Secret/NoForN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Tracked- IFV- Bradley BFVS Linebacker M-6

**Reference (Cunningham et al., 1998):**

Cunningham, E., Wald, L., Harris, L., Raleigh, D., Reza, J., Raleigh, D., Hess, L., & Roberts, B. (1998). System Assessment (SA) for the Bradley Linebacker (Training Release): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. USAEC, APG, MD. DTIC ADB236184

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

190300 - Combat Vehicles

Descriptors:

(U) \*WEAPON SYSTEMS, \*COMBAT VEHICLES, \*ARMORED VEHICLES, SURVIVABILITY, ARMY TRAINING, OPERATIONAL EFFECTIVENESS, ANTI-AIRCRAFT WEAPONS, SYSTEMS ANALYSIS, ELECTROMAGNETIC ENVIRONMENTS

Identifiers:

(U) TRAINING VEHICLE, \*BRADLEY LINEBACKER WEAPON SYSTEM

**System Description:**

The Linebacker, M-6, National Stock Number (NSN) 2350-01-448-0368 will provide US Army heavy armored maneuver forces with dedicated air defense against a variety of threat platforms. The M-6 Linebacker also provides improved crew survivability, increased mobility, improved target acquisition and night-fighting capabilities. The Linebacker is an upgrade to the existing Bradley Fighting Vehicle with the addition of the Linebacker modification system, FAADS Command, Control, Communications and Intelligence (C3I), and the Bradley ODS Kit. The Linebacker team consists of a four-man crew: commander, gunner, driver, and crew member to provide the primary means for fire support planning of various types for the US Army maneuver forces. The Bradley-Linebacker system allows the gunner to engage low-altitude, high-speed, fixed-wing and rotary-wing aircraft, cruise missiles, and unmanned aerial vehicles with Stinger missiles while remaining under armor. The Stinger system replaces or modifies components of the TOW system.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Tracked- IFV- Bradley BFVS M2A3/M3A3

**Reference (OPTEC, 1997):**

OPTEC. (1997). System Assessment (SA) for the Bradley Fighting Vehicle System A3 (BFVS-A3) Low Rate Initial Production 1 Decision: U.S. Army Operational and Test Evaluation Command (OPTEC), Attn: CSTE-OEC-CCE-I, Park Center IV, Alexandria, VA 22302-1458. DTIC ADB226725.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

190300 - Combat Vehicles

Descriptors:

(U) \*COMBAT VEHICLES, TEST AND EVALUATION, MILITARY REQUIREMENTS, RISK, PRODUCTION, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, SYSTEMS ANALYSIS, LOW RATE

Identifiers:

(U) M-2 VEHICLES, M-3 VEHICLES

**System Description:**

The BFVS-A3 includes improvements in lethality, survivability, mobility, sustainability, and command and control required to defeat current and future threat forces while remaining operationally and digitally compatible with the main battle tank in the combined arms force. Where possible, existing BFVS-A3 line replacement items will be used. The BFVS-A3 contains the following key systems:

**a. Vehicle Control and Operations System (VCOS).** The VCOS provides coherent, integrated crew stations for the vehicle commander, gunner, and driver. The system allows the crew to optimally flight the vehicle by controlling and automating many of the functions. The commander's controls and displays allow the preparation, transmission, reception, storage and display of digital messages, to include the disposition of friendly and enemy forces. The VCOS is supported by the following:

**(1) Commander's Tactical Display (CTD) and Data Entry Tool (keyboard).** This color flat panel display conveys the tactical situation to the commander and allows him to prepare and display tactical messages. Via the CTD and keyboard, the commander is able to send and receive operational information through the VCOS to and from other vehicles. Operation of the command and control (C2) system, control of the Single Channel Ground and Airborne Radio System (SINCGARS), display and control of the position/navigation (POS/NAV) sensor unit information, execution and display of built in test/diagnostics, and display for embedded training and technical manuals (TM's) are all possible using these components.

**(2) Gunner's Biocular Display and Sight Control Panel.** This system provides the gunner an Improved Bradley Acquisition System (IBAS) interface for the Improved Forward Looking Infrared (IFLIR), day television or direct view optics as well as the capability to control sight picture clarity and quality.

**(3) Squad Leader's Display Unit.** A CTO placed in the Bradley squad compartment. This display unit enables the mounted squad leader to monitor images relayed from the Commander's Independent Viewer (CIV), CTO, IBAS, or the driver's viewer enhancer (DVE)

**(4) Mass Memory Unit (MMU).** This device stores digital maps and technical manuals.

**(5) Turret Processor Unit (TPU).** The TPU provides the battlefield command and control system (BCCS), data communication and information management, power management, system diagnostics, POS/NAV, fire control integration of sensors, weapons controls, automatic target tracking, automatic super elevation and lead through the 1553 data bus. The TPU manages system/subsystem status and modes as well the tactical display and map graphics.

**(6) Hull Processor Unit (HPU).** The HPU integrates hull sensors and input devices for inclusion on the 1553 data bus. The HPU also provides for redundant bus data communication and fire control functions.

**(7) Built in Diagnostics.** Facilitated by the vcas, this improvement offers built in fault detection and preventive maintenance checks and services (PMCS). These checklists expedite checks and isolation of maintenance problems.

**(8) System Software.** System software is organized hierarchically. The main functional groups are fire control (ballistic solution of weapon control) and command and control (acquire data and direct action). The first level of support is the soldier-machine interface which manages the collection of operator inputs and display of information to the operator. The next level of support is diagnostics, power management and navigation. Lastly, the system manager and operating environment provide functions for all software applications.

**b. IBAS.** The IBAS is equipped with a dual axis stabilized head assembly, second generation Horizontal Technology Integration (HTI) FLIR, a charged coupled device (CCO) camera, and direct view optics (DVO) to provide an all weather capability to acquire and aid in target tracking. The IBAS also incorporates an eyesafe laser rangefinder (LRF) to provide the gunner and commander accurate range and selected target location data. Both the gunner and commander can display range information and control use of the range finder. A missile control subsystem with reprogrammable memory provides capability for dual target tracking and quick upgrade for future missiles. IBAS will increase target engagement capability by improving target detection. The aided target tracking provides a dual tracking capability reduces engagement times increases combat effectiveness. The A3 will provide significant visibility improvement over the Bradley A2. Apart from target acquisition, target engagement capability is enhanced by the following:

**(1) Aided Target Tracking.** An improvement which allows the sight reticle to remain stabilized on the target while the target is being engaged.

**(2) Automatic Target Super-Elevation.** A system improvement for the BFVS M242 25mm gun that uses range data and ammunition specific ballistic data to automatically super-elevate the gun barrel for the selected target.

**(3) Automatic Target Lead.** A system improvement for the 25mm gun that uses range data, ammunition specific ballistic data and target relative rate of return to automatically lead a target.

**(4) Automatic Boresight.** A system improvement that aligns the IFLIR and LRF with the day sight. It also allows boresighting the IFLIR and range finder during darkness. Manual boresighting of the day sight is still required.

**(5) Dual Tracking (TOW missile and 25mm cannon).** This improvement enables the gunner to acquire and track two targets within the same field of view simultaneously. The gunner may engage one target with a TOW missile and as soon as the missile impacts, immediately engage the other target with a second missile. The 25mm cannon may be used in a similar manner.

**c. Commander's Independent Viewer (CIV).** Provides the commander the capability to search for targets independently of the gunner's field of view and automatically hand off the designated target to the gunner (hunter-killer). The CIV incorporates a CCD television camera and second generation IFLIR for use under all vision conditions.

**d. Position / Navigation System (POS/NAV).** With a global positioning system (GPS) receiver, the POS/NAV system provides accurate location determination. The POS/NAV system and the GPS provide grid coordinates on the commander's display. The vehicle location, waypoints, and steer-to information are provided at both the commander's and the driver's displays. This capability will enable the A3 crew to pinpoint their position at all times and to navigate to any predetermined destination under all weather conditions.

**e. Gas Particulate Filter Unit (GPFU).** Ventilated face piece GPFU for the mounted squad. This system provides the same ventilated face piece GPFU to the dismount element that is now provided to the vehicle crew.

**f. Improved Driver's Vision.** The all weather DVE, coupled with the POS/NAV information at the driver's station, will enhance the driver's situational awareness and consequently improve the mobility of the vehicle.

**g. Fire Control/Missile Guidance System.** The IBAS, CIV, turret drive subsystem, and the fire control software combine to provide stabilized sights, automatic target tracking, and ballistic offsets for gun and missile guidance.

**h. Roof Fragmentation Protection.** Application of additional armor to the roof of the turret gives added protection against fragments from air burst artillery rounds.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Tracked- IFV- Bradley BFVS M2A3/M3A3

**Reference** (DeLuca et al., 2000):

DeLuca, C., Fillingier, L., Jenkins, H., Marshall, W., Musser, D., Myers, J., Portz, B., Satterthwaite, J., Vegoda, R., & White, D. (2000). System Assessment (SA) for the Bradley Fighting Vehicle System - M2a3: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB252718.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

190300 - Combat Vehicles

Descriptors:

(U) \*COMBAT VEHICLES, TEST AND EVALUATION, COMPUTER PROGRAMS, MANUFACTURING, SURVIVABILITY, INFANTRY, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, COMMAND AND CONTROL SYSTEMS, SYSTEMS ANALYSIS

Identifiers:

(U) \*BRADLEY INFANTRY FIGHTING VEHICLE SYSTEM, BRADLEY CAVALRY FIGHT VEHICLE SYSTEM, M2 COMBAT VEHICLE, M3A3 COMBAT VEHICLE, IC3(INTEGRATED COMBAT COMMAND AND CONTROL SYSTEM), FBCB2(FORCE XXI BATTLE COMMAND BRIGADE AND BELOW), PVT(PRODUCTION VERIFICATION TESTING), FBCB2 COMPUTER PROGRAM

**System Description:**

**a. General.** The BFVS consists of the M2 Infantry Fighting Vehicle (IFV) and the M3 Cavalry Fighting Vehicle (CFV). The IFV and the CFV are fully tracked, medium armored fighting vehicles intended to provide protected, superior cross-country mobility and vehicular mounted firepower to infantry/cavalry units. The IFV is designed to support the mounted combat infantry squad. The CFV is modified to accommodate armored cavalry missions of reconnaissance, security, and economy of force operations. Both vehicles are designed to operate compatibly with other platforms on the digitized battlefield, when operated by typical soldiers within IIB, 11M, and 19D Military Occupational Specialties (MOS).

**b. Critical System Characteristics.**

(1) Provide the capability to host an Integrated Combat Command and Control (IC3) system that is compliant with the Joint Technical Architecture - Army (JTA-A). The design must allow interface of critical information between the vehicle and the Tactical Internet and allow the A3 platform to interface with the other Force XXI Battle Command Brigade and Below (FBCB2) platforms. The vehicle must have the capability to send and receive digital messages using the Joint Variable Message Format (JVMF).

- (2) Improve the capability of the A3 target acquisition and fire control systems, include a ballistic fire solution for the main gun system and add a Commander's Independent Viewer (CIV) for the vehicle commander.
- (3) Improve survivability.
- (4) Provide ventilated face pieces for NBC protection of dismount element personnel while they are in the vehicle.
- (5) Provide a primary Position Navigation (POS/NAV) System consisting of a primary global positioning system (GPS), and a backup inertial navigation system.
- (6) Maintain cross-country mobility with the MBT in forward speeds.
- (7) Provide integrated diagnostic/BIT/BITE as a cost-effective means of fault detection/isolation for the upgraded portions of the vehicle.
- (8) Cause no changes in crew and support personnel requirements.

**c. Key Sub-systems and Objective Functionality.**

- (1) Vehicle Control and Operations (VCO). Provide coherent, integrated crew stations for the vehicle commander, gunner, and driver. The system must allow the crew to optimally fight the vehicle by controlling and automating as much of the functionality as possible. The commander's controls and displays must allow the preparation, transmission, reception, storage and display of digital messages, to include the disposition of friendly and enemy forces. The VCO is supported by the following:
  - (a) Commander's Tactical Display (CTD) and Commander's. Data Entry Unit. The CTD hardware will consist of an IC3 Central Processing Unit (CPU), a color flat panel display, the Commander's Hand Station (CHS), and a back-lit keyboard which connects to the display unit. This equipment, in conjunction with the Commander's Independent Viewer (CIV), biocular display and controls is intended to provides the tactical situation to the commander and allow him to prepare and display tactical messages. The commander is able to send and receive operational information to and from other vehicles. Operation of the IC3 system, control of the Single Channel Ground/Air Radio System (SINCGARS), display and control of the POSINAV sensor unit information, and execution and display of Built-In-Test/Diagnostics are all possible using these units.
  - (b) Gunner's Biocular Display and Sight Control Panel. Provides a day/night sight display for the gunner, as well as the capability to select weapon/ammunition.
  - (c) Squad Leader's Display Unit. Enables the squad leader to receive selected information relayed from the CIV, and from the commander's tactical display or Integrated Bradley Acquisition System (IBAS), while the dismount unit leader is in the vehicle. The intent is to improve situational awareness of the dismount element and ease personnel transition from mounted to dismounted operations.
  - (d) Turret Processor Unit (TPU). The TPU provides the IC3 system interface to the vehicle, data communication and information management, power management, system diagnostics, POSINAV, fire control integration of sensors, weapons controls, automatic target tracking, automatic super-elevation and lead through the 1553 bus. The TPU manages system/subsystem status and modes, and interfaces among the IC3 components.
  - (e) Hull Processor Unit (HPU). The HPU integrates hull sensors for inclusion on the 1553 bus.
  - (f) Built-In-Test Diagnostics. Facilitated by the Vehicle Diagnostics and Maintenance System (VDMS), this improvement offers built-in fault detection and preventive maintenance checks and services (PMCS) checklists to expedite checks and isolation of maintenance problems.
  - (g) System Software. System software is organized hierarchically, the main functionality groupings are: fire control (ballistic solution of weapon control) and command and control (acquire data, direct action). The first level of support is the Soldier-Machine Interface (SMI) which manages the collection of operator inputs and display of information to the operator. The next level of support is diagnostics, power management, and navigation. Finally, the system manager and operating environment provide functions for all software applications.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

**Reference** (Deluca et al., 2001):

Deluca, C., Fillinger, L., Jenkins, H., Musser, D., & Myers, J. (2001). System Evaluation Report (SER) for the Bradley Fighting Vehicle System (BFVS) - M2/M3A3: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 10878424 / 2001-SER-1785B. DTIC ADB264900.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190300 - Combat Vehicles

Descriptors:

(U) \*COMBAT VEHICLES, TEST AND EVALUATION, COMPUTER PROGRAMS, INTEGRATED SYSTEMS, SURVIVABILITY, MILITARY VEHICLES, OPERATIONAL EFFECTIVENESS, COMMAND AND CONTROL SYSTEMS, SYSTEMS ANALYSIS

Identifiers:

(U) BRADLEY FIGHTING VEHICLES, M-2 VEHICLES, M-3 VEHICLES

**System Description:**

1.4.1 General. The BFVS family consists of the M2 Infantry Fighting Vehicle (IFV) and the M3 Cavalry Fighting Vehicle (CFV). The IFV and the CFV are fully tracked, medium armored fighting vehicles intended to provide protected, superior cross-country mobility and vehicular-mounted firepower to infantry and cavalry units. The IFV is designed to support the mounted combat infantry squad. The CFV is modified to accommodate armored cavalry missions of reconnaissance, security, and economy of force operations. Both vehicles are designed to operate with other platforms on the digitized battlefield, when operated by typical soldiers within 11 H, 11M, and 19D MOSs.

1.4.2 BFVS A3. The A3 version of the BFVS includes improvements in lethality, survivability, sustainability, and command and control (C2) required to defeat current and future threat forces while remaining operationally and digitally compatible with the main battle tank in the combined arms force. The BFVS A3 contains the following key components:

1.4.2.1 Vehicle Control and Operating System (VCOS). The VCOS provides coherent, integrated crew stations for the vehicle commander, gunner, dismounted squad and driver. The system allows the crew and dismounts to optimally fight the vehicle by controlling and automating as much of the functionality as possible. The commander's controls and displays allow the preparation, transmission, reception, storage and display of digital messages, to include the disposition of friendly and enemy forces. The VCO is supported by the following:

1.4.2.1.1 Commander's Tactical Display (CTD) and Data Entry Tool (CDET). The CTD, a color flat-panel display, provides the tactical situation to the BFVS commander and allows him to prepare and display tactical messages. The commander is able to transmit and receive operational information to and from other vehicles. Operation of the C2 system, control of the radios, display and control of the POSINAV sensor unit information, execution and display of Built-In-Test/Diagnostics, and display of embedded training and technical manuals (TMs) are provided by these units. .

1.4.2.1.2 Gunner's Biocular Display and Sight Control Panel. These units provide a day and/or thermal sight display for the gunner, as well as the capability to select weapons and ammunition.

1.4.2.1.3 Squad Leader's Display (SLD) Unit. The SLD enables the squad leader to receive selected information relayed from the CIY, CTD, IBAS and Driver Vision Enhancer (DVE) (when available), while the dismount leader is in the vehicle. This capability provides situational awareness to the dismount element and eases personnel transition from mounted to dismounted operations.

1.4.2.1.4 Turret Processor Unit (TPU). The TPU provides the integrated command, control, and communications (IC3) system interface to the vehicle, data communication and information management, power management, system diagnostics, POSINAV, integration of fire control sensors, weapons controls, automatic target tracking and automatic superelevation and lead through 1553 and Ethernet data buses. The TPU manages system and subsystem state and modes, and interfaces among the IC3 components.

1.4.2.1.5 Hull Processor Unit (HPU). The HPU integrates hull sensors for inclusion on the 1553 data bus.

1.4.2.1.6 Built-In-Test Diagnostics. Facilitated by the Vehicle Diagnostics and Maintenance System (VDMS), this improvement offers built-in fault detection and preventive maintenance checks and services (PMCS) checklists to expedite checks and isolation of maintenance problems.

1.4.2.1.7 System Software. System software is organized hierarchically. The main functionality groupings are: fire control (ballistic solution, servo control, and weapon control) and command and control (interface to/from Applique CPU running FBCB2 software). The first level of support is the soldier-machine interface (SMI) which manages the collection of operator inputs and display of information to the operator. The next level of support is diagnostics, power management, and navigation. Finally, the system manager and operating environment provide functions for all software applications.

1.4.2.2 Improved Bradley Acquisition System (IBAS). The mAS is the integrated improved forward-looking infrared (I-FUR), Day TV, and Direct View Optics (DVO) designed to increase the effective target acquisition range for longer-range cannon and missile shots. It is also designed to add to the target acquisition capability for indirect and close air engagement.

1.4.2.3 Commander's Independent Viewer (CIV). The CIV is designed to allow the BFVS A3 commander to search for targets independently of the turret position.

1.4.2.4 Position/Navigation System (POSINAV). The POSINAV is an embedded global positioning and inertial navigation system designed to increase the accuracy of vehicular mounted navigation, increase lethality of call-for-fire support, and reduce the incidents of fratricide attributable to poor position reporting and situational awareness.

1.4.2.5 Ventilated Face Pieces. The ventilated face pieces for the squad are designed to increase the fighting capability of the BFVS A3 in nuclear, biological and chemical (NBC) battlefield environments.

1.4.2.6 Fire Control and Missile Guidance System. The fire control and missile guidance system is designed to allow the BFVS A3 gunner to engage targets with the 25mm cannon; the 7.62mm coaxial mounted machinegun; and the TOW.

1.4.2.7 Single Channel Ground and Airborne Radio System (SINCGARS). The system improvement program, internet controller (SINCGARS SIP INC) is designed to allow the BFVS A3 commander to interface digitally with other elements on the battlefield.

1.4.2.8 Roof Fragmentation Protection. Roof fragmentation protection is designed to provide improved survivability for crewmembers from top-attack munitions over that of previous BFVS models.

1.4.3 Critical System Characteristics.

a. Provide Integrated Combat Command and Control (IC3) by hosting an Applique CPU running FBCB2 software that is compliant with the Joint Technical Architecture-Army (JTA-A). The design must allow interface of critical information between the vehicle and the tactical internet and allow the A3 platform to interface with the other Force XXI Battle Command Brigade and Below (FBCB2) platforms. The vehicle must have the capability to send and receive digital messages using the Joint Variable Message Format (JVMF).

b. Improve the capability of the BFVS target acquisition and fire control systems, include a ballistic fire solution for the main gun system and add a Commander's Independent Viewer (CIY) for the vehicle commander.

c. Improve survivability.

d. Provide ventilated face pieces for NBC protection of dismount element personnel while they are in the vehicle.

e. Provide a Position Navigation (POSINAV) System consisting of a primary global positioning system (GPS) and a backup inertial navigation system.

f. Maintain cross-country mobility with the Abrams tank in forward speeds.

g. Provide integrated diagnostic/built-in test/built-in test equipment (BIT/BITE) as a cost-effective means of fault detection/isolation for the upgraded portions of the vehicle.

h. Cause no changes in crew and support personnel requirements.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Tracked- IFV- Bradley BFVS ODS-E

**Reference** (Faker et al., 2002):

Faker, D., Rouse, J., White, D., Vegoda, R., Reich, P., Fillinger, L., Jenkins, H., & Hawley, B. (2002). System Evaluation Report (SER) for the M2A2 Bradley Fighting Vehicle System (BFVS) Operation Desert Storm-Engineer (ODS-E): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 21898692. DTIC ADB280934.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

150606 - Land Mine Warfare

190100 - Ammunition and Explosives

190300 - Combat Vehicles

Descriptors:

(U) \*EXPLOSIVE CHARGES, \*MINE CLEARANCE, \*ARMORED VEHICLES,

Identifiers:

(U) BFVS(BRADLEY FIGHTING VEHICLE SYSTEM), M2A2 BRADLEY FIGHTING VEHICLE SYSTEM, ODS-E(OPERATION DESERT STORM- ENGINEER), MICLIC(MINE CLEARING LINE CHARGE)

**System Description:**

The M2A2 BFVS ODS-E (herein referred to as the ODS-E) incorporates all of the features of the Digitized M2A2 BFVS ODS vehicle, providing the same level of mobility and digitized information as the units it is supporting. The ODS-E is a basic M2A2 BFVS ODS Platform with the Applique 'A Kit' (Model # IK with an FBCB2 V4 computer installed). The 1-22 Infantry Battalion at Fort Hood is the only unit which has the Applique 'A Kit' installed. Unlike the basic M2A2 BFVS ODS, the ODS-E has no dismount squad leader's display, video amplifier box, or cursor control box. In addition, the M2A2 BFVS ODS has been modified to a combat engineer configuration to allow engineers to stow their special equipment such as demolitions, chain saws, mine detectors, Bangalore torpedoes, C-4, and tool kits. To accommodate the stowage of the engineer equipment, the Tube-launched Optically tracked Wire-guided (TOW) Missile racks under the right side squad seat were modified from the M2A2 BFVS ODS stowage.

The ODS-E will be capable of self-defense. Self-defense is defined as two TOW missiles (in launcher), 300 25mm rounds (all in the ready box), and 2,200 7.62mm rounds (800 ready and 1,400 stowed). At the task force level, the ODS-E synchronizes with the Wolverine to fully modernize divisional combat engineers. The ODS-E provides maneuverability, speed, and ballistic protection in addition to improved situational awareness. The ODS-E will have increased Command, Control, Communications, Computers, and Intelligence (C4I) and maneuver capabilities. The engineers will continue to conduct their primary mobility, counter-mobility, and survivability tasks as listed in the Army Universal Task Lists (AUTLs). As such, the ODS-E will be the front-line battlefield M2A2 BFVS. Therefore, the concepts on the employment of engineers remain unchanged; there will be only a minor impact on doctrine. The MICLIC is a rocket-projected explosive line charge that provides a "close-in" breaching capability for maneuver forces. It is effective against conventionally fused mines and, when detonated, provides a lane 8 meters wide by 100 meters long. The MICLIC system consists of an M353 3 1/2-ton or M200A1 2 1/2 ton trailer (or M200A1 tracked trailer) chassis, a launcher assembly, an M147 firing kit, an M58A3 line charge and a 5-inch MK22 Mod 4 rocket. The M200A1 tracked trailer uses a rubberized Mobile Track System (MTS) to enhance mobility in marginal terrains and reduces the shock and vibration environment. The line charge is 350 feet long and contains 5 pounds of composition C-4 explosive per linear foot. The firing cable to fire the MICLIC is routed through the ODS-E firing port weapon aperture, which allows it to be deployed and fired with the crew protected inside the ODS-E.

Engineer units employ MICLIC in response to minefield breaching requirements identified by the maneuver unit. A typical mission is as follows: the Engineer Company's MICLIC trailers are moved to a position designated by the maneuver commander and the line charge prepared for firing by an Engineer squad. Suitable combat vehicles tow the MICLIC trailers to the Tactical Assembly Area (TAA). The ODS-E tows the MICLIC trailer from the TAA to the point of the breach.

Movement to the firing site and execution is done under control of the breach force commander. A second MICLIC may be fired from the breached lane if a longer breach is required. If additional breaching missions are anticipated after firing, the empty trailer is reloaded with another line charge brought forward from the supply trains. It may also be towed to a preselected position and dropped for later recovery by support elements.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Tracked- IFV- Bradley LBR-6

**Reference** (ATEC, 2006):

ATEC. (2006). System Assessment (SA) for the Bradley Fighting Vehicle System LBR-6 Reactive Armor Test Program: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report # 62909196. Report Classification: SECRET/NOFORN. Citation Unclassified.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

**System Description:**

Bradley Fighting Vehicle System LBR-6 Reactive Armor Test Program

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Tracked- Tank- Abrams M1A2 SEP

**Reference** (Snyder et al., 1997):

Snyder, S. D., Figueroa, L. A., March, A. D., & Portz, B. (1997). Test and Evaluation Report (Ter) for the Follow-on Test of the M1A2 Abramstank System Enhancement Program: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. CCTD, Fort Hood, TX. DTIC ADB221469.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

190300 - Combat Vehicles

Descriptors:

(U) \*OPERATIONAL EFFECTIVENESS, \*TANKS(COMBAT VEHICLES), TEST AND EVALUATION, MILITARY REQUIREMENTS, ARMY TRAINING, OPERATIONAL READINESS, MACHINE GUNS, FUEL CONSUMPTION, ARMY OPERATIONS, INTERCOMMUNICATION SYSTEMS, TARGET POSITION INDICATORS, TANK ENGINES, TANK TURRETS, TANK WARFARE

Identifiers:

(U) M1A2 TANKS, LPN-OPTEC-1996-FO-CMBT-1358C

**System Description:**

The M1A2 tank is a full-tracked, low profile, armored, land combat assault vehicle that is designed to increase the tank fleet's useful life by enabling it to defeat the threat through the year 2000. The 4-man crew has the capability to engage the full spectrum of enemy ground targets with a variety of accurate point and area fire weapons. The M1A2 is an enhancement of the M1A1 Abrams tank in the areas of lethality, fightability, and survivability. The M1A2s evaluated were conversion models with software version 2.4.3, equipped with External Auxiliary Power Unit (EAPU) and modified with the addition of the Touch Temperature Reduction Kit.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Tracked- Tank- Abrams M1A2 SEP

**Reference** (Gill II and Schmidt, 2001):

Gill II, L. E., & Schmidt, R. C. (2001). System Evaluation Report (SER) for the M1A2 Abrams System Enhancement Package (SEP): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 11628491 / 2001-FO-CMBT-1358E. DTIC ADB267258.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190300 - Combat Vehicles

Descriptors:

(U) \*TANKS(COMBAT VEHICLES), TEST AND EVALUATION, OPTIMIZATION, ACQUISITION, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, SYSTEMS ANALYSIS, TANK GUNS

Identifiers:

(U) M1A2 TANKS, SEP(SYSTEM ENHANCEMENT PACKAGE), RCA(REQUIREMENTS COMPLIANCE ASSESSMENT)

**System Description:**

The Abrams M1A2 SEP tank is a full-tracked, armored, land combat vehicle operated by a four-man crew consisting of a commander, gunner, loader, and driver. It upgrades the M1A2 by providing increased memory and processor speeds, full color tactical display, digital map capability with the Army Technical Architecture, improved target detection, recognition, and identification through incorporation of 2nd Gen FLIR technology, and electronics and crew compartment cooling by the addition of an air conditioning system called the TMS. Lengthened Mounted Surveillance Mode (MSM) capability, through the addition of an UAAPU, was originally part of the M1A2 SEP tank, but, due to technical difficulties, has been delayed to a later cut-in time. The M1A2 was an enhancement of the M1A1 Abrams tank in the areas of survivability, lethality, and fightability through the utilization of state-of-the-art electronics and ammunition, plus the integration of currently developed tank technology. The M1A2 SEP has a high degree of software reuse with the M1A2.

**1.4.2 Key Hardware Systems.** The key hardware systems are described below:

**1.4.2.1 Commander's Independent Thermal Viewer (CITY).** The CITY is a fully-integrated, full-target backup engagement sight designed to provide the commander, through the Commander's Display Unit (CDU) with a surveillance capability equivalent to that of the GPS Thermal Imaging System (TIS). SEP incorporates the 2nd Gen FLIR TIS into the CITY. The tank commander can independently acquire targets (hunter) with the CITY while the gunner engages targets (killer), thereby increasing survivability by more rapidly destroying targets. In addition to independent target acquisition, the CITY provides the commander the ability to hand-off targets to the gunner or to independently engage targets as the necessity arises.

**1.4.2.2 Commander's Control Handle Assembly (CCHA).** The CCHA gives the tank commander the ability to override the gunner and permits him to operate the Laser Range Finder (LRF) and to aim and fire the main gun or coax machine gun. It also provides the controls to operate the CITY and to position/control a cursor on the CDU. The CCHA has a newly designed button and switch positioning when compared to the existing Commander's Weapon Station Handle (CWSH).

**1.4.2.3 Hull-Turret Position Sensor (HTPS).** The HTPS provides a signal to the Fire Control Electronics Unit (FCEU), which indicates the relative angle of the hull and turret. This angle is used with the POSINAV hull roll and pitch angles to provide a turret dynamic cant signal. This replaces the cant sensor signal because POSINAV is integrated into the M1A2 fire control. The cant sensor is still present and serves as a backup unit for stationary firing.

**1.4.2.4 Gunner's Primary Sight (GPS).** The M1A2 SEP GPS is a further enhancement of the M1A1 GPS. The M1A2 SEP GPS upgrade included a Dual Axis Head Assembly (DAHA), which enables head mirror movement in azimuth as well as elevation. The greater responsiveness of this system is designed to improve target tracking and give a more stable azimuth scene and reticle. The M1A2 SEP GPS enhancement includes a 2nd Gen TIS, incorporating a Biocular Display. This enhancement was included to improve the M1A2 SEP's detection, recognition and identification range capabilities.

**1.4.2.5 Under Armor Auxiliary Power Unit (UAAPU).** The UAAPU was designed to provide auxiliary electrical and hydraulic power for tank's MSM operational scenarios. The primary components of the UAAPU were a single-stage gas turbine engine with regenerative heat exchanger, air filtration system, gear assembly, hydraulic pump and electrical generator. The UAAPU was designed for mounting in the left rear sponson of the chassis under existing am10r and replaces the left rear sponson fuel tank. The UAAPU did not successfully complete developmental testing and was subsequently dropped from both FOTE evaluations. The left rear sponson fuel tank was not replaced, decreasing the available engine fuel supply by 59 gallons.

**1.4.2.6 Thermal Management System (TIYIS).** The TMS provides macro cooling of the crew compartment to reduce crew fatigue due to heat stress and reduce Line Replaceable Unit (LRU) operating and touch temperatures. The primary components of the TMS are the VCSU and the ABU. The VCSU is mounted in the turret bustle rack and contains the vapor compression refrigeration system loop and a portion of the Propylene Glycol and Water (PGW). The AHU is mounted inside the turret in front of the GPS. The AHU absorbs heat from the crew compartment via a PGW-air heat exchanger, which is then transferred to the external VCSU and exhausted to the ambient atmosphere. The TMS is electronically controlled and powered by the tank's hydraulic system when the main engine is running. During main engine-off operation, the TMS will also be powered by the UAAPU when it is installed. The TMS was initially fielded with a VCSU rated at 5.25 kW cooling capacity. A future upgrade will increase this to 7.5 kW.

**1.4.3 Key Software Systems.** The M1A2 SEP has an updated digital electronics system. The primary design feature of the M1A2 SEP electronics system is modularity. Ten (10) Computer Software Configuration Items (CSCI) linked by a MIL-STD-1553B Data Bus comprise the entire software portion of the M1A2. An exception is the Force XXI Battle Command Brigade and Below (FBCB2) software. (Originally the M1A2 SEP used interim command and control software called Embedded Battle Command (EBC). Following FOTE III, the M1A2 SEP migrated directly to FBCB2 software.) This software and the Solaris operating system software are stored on the Mass Memory Unit (MMU). Upon power up, the Intel card loads the Solaris operating system from the MMU and then starts the FBCB2 application. The FBCB2 software is executed out of the Intel card Random Access Memory. Each CSCI is housed in a single Hardware Configuration Item (HWCI) except the Line of Sight (LOS) CSCI, which is housed together within the FCEU CSCI in the FCEU HWCI and the FBCB2 software. Further breakdown of the CSCI's to computer software units (CSU) and components is defined in the Computer Resource Lifecycle Management Plan (CRLCMP). A non-developmental graphics kernel was used for real time graphic display. Application Specific Integrated Circuit (ASIC) technology was used in the Utility Bus Interface Chip (UBIC) of the Power Management subsystem. The M1A2 system is implemented as a distributed set of multi-tasking processors, with one or more processors per LRU. Versa Module European (VME) backplane is used to achieve modularity. The software is fielded in the tank as downloadable software within nonvolatile memory. Software improvements will occur at roughly one-year intervals. They will be safety released by the US Army Developmental Test Command (DTC) and released to the field for downloading into tanks. Approximately fifty percent of the M1A2's SEP memory has not been utilized and is available for use (see M1A2 CRLCMP for details on read only memory (ROM) usage). A listing of key LRUs follows.

**1.4.3.1 Mass Memory Unit (MMU).** (New in the M1A2 SEP.) The MMU provides a source of 2 Gigabytes of secondary storage to the system architecture. The MMU will store Computer Aided Design Raster Graphics (CADRG) NIMA map products and the US Army's FBCB2 software. In addition, the MMU provides a Type II or a Type III Personal Computer Module Card Interface Adapter (PCMCIA) interface, which will provide the architecture with another path of data downloading. The data from the MMU is connected to the Commander's Electronic Unit (CEU) via a Small Computer System Interface (SCSI) -II interface.

**1.4.3.2 Turret Mission Processing Unit (TMPU).** (Called the Turret Electronics Unit (TEU) prior to the M1A2 SEP.) The TMPU is the control, communications, and processing heart of the electronics system. It manages a MIL-STD-1553B Data Bus, which provides communication among the LRUs of the system. The TMPU also provides resources for the fire control computations and system diagnostics. The TMPU

is designated as the backup for functions primarily performed in the Hull Mission Processing Unit (HMPU) providing a dual redundancy capability that enhances fightability and survivability. The TMPU differs from the HMPU in that it also houses the Abrams Embedded Global Positioning Satellite Receiver (AEGR), which updates the POSINAV system

**1.4.3.3 Hull Mission Processing Unit (HMPU).** (Called the Hull Electronics Unit (HEU) prior to the M1A2 SEP.) The HMPU is the power controller of the tank and processing core of the hull electronics system. The HMPU controls power management on the utility bus. The HMPU provides computational resources for automotive management, POSINAV, Nuclear, Biological and Chemical (NBC) Collective Protective System, and power management. It also is designated as the backup for functions primarily performed in the TMPU, including backup bus controller for the MIL-STD-1553B Data Bus.

**1.4.3.4 Commander's Electronics Unit (CEU).** (New in the M1A2 SEP.) The CEU provides processing capability that supports all Command, Control, and Communications (C3) as well as CDU functions. The CEU provides hardware interface to the CDU, Keyboard, MMU, and Internet controller, which in turn interfaces with Single Channel Ground Airborne Radio System (SINCGARS) and Enhanced Position Location Reference System (EPLRS). The CEU functionality previously resided in the Commander's Integrated Display (CID), HEU/TEU and the Radio Interface Module (RIM).

**1.4.3.5 Commander's Display Unit (CDU).** (Called the CID prior to the M1A2 SEP.) The CDU provides the soldier/machine interface between the commander and the tank, which includes displays and controls for the CITY. The SEP integrates a 2nd Gen FUR flat panel display.

**1.4.3.6 Driver's Integrated Display (DID).** The DID provides control and monitoring functions for the vehicle powerpack. It also monitors engine system status and control signals transmitted from the Digital Electronic Control Unit (DECU) and communicates with the HMPU. The DID also provides the driver with navigation information.

**1.4.3.7 Gunner's Control and Display Panel (GCDP).** The GCDP replaces the existing M1AI Computer Control Panel (CCP) and provides the gunner with control and display functions required for the gunnery task. It interfaces the vehicle through the MIL-STD-1553B data bus, providing the FCEU and TMPU data to calculate and resolve ballistics.

**1.4.3.8 Fire Control Electronics Unit (FCEU).** The FCEU controls the operation of the main gun, coaxial machine gun, and grenade launchers plus controlling the motion of the Gun and Turret, GPS, and the CITY. The FCEU also performs current mode determination and data gathering functions in addition to providing for dynamic cant data from the POSINAV system and the HTPS. These data are provided to the TMPU and HMPU, which then generates a ballistic solution.

**1.4.3.9 Position/Navigation System (POS/NAV).** The POSINAV provides data indicating the position and heading of the tank, the hull roll, and pitch angles for dynamic cant, the azimuth rate, and align count. The POSINAV includes provisions for rapid initialization of heading, and for initialization of position by reference to known waypoints, both adjacent and remote. Vehicle position is displayed on the CDU, stored in the FCEU and CEU and is manipulated by the DID. The POSINAV is updated with position and velocity by the AEGR.

**1.4.3.10 Gunner's Primary Sight/Line-of-Sight (GPS/LOS).** The LOS CSCI interfaces with the DAHA hardware through the following modules: LOS Digital Processor, LOS Analog Interface, and LOS Power Amplifier. The DAHA receives and transmits the line-of-sight position and rate information from and to the FCEU system processor via the combination of the above modules. FCEU system processor commands the DAHA via the VME backplane and the three LOS modules.

**1.4.3.11 Digital Electronic Control Unit (DECU).** The DECU is an upgrade from the current Electronic Control Unit (ECU) in the areas of engine maintainability, recuperator life, fuel consumption, and survivability. A Universal Asynchronous Receiver/Transmitter is the I/O port. The DECU provides a backup MIL-STD-1553B interface and an RS-232 interface.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Tracked- Tank- HAB- Wolverine M1A2 SEP

**Reference** (Kravitz and Tarquina, 1999):

Kravitz, L., & Tarquina, K. (1999). System Assessment (SA) for the Phase 2 of the Vulnerability Test (Including Live Fire) for the Wolverine Heavy Assault Bridge (HAB) (U): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. DTIC ADC062567. Report Classification: SECRET/NOFORN. Citation Unclassified.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)  
Fields and Groups:

131200 - Safety Engineering

Descriptors:

(U) \*DAMAGE ASSESSMENT, \*MILITARY BRIDGES, MATHEMATICAL MODELS, FIRING TESTS(ORDNANCE), FINITE ELEMENT ANALYSIS, VULNERABILITY, TERMINAL BALLISTICS

Declassification:

OADR

Identifiers:

(U) LIVE FIRE TESTS, HAB(HEAVY ASSAULT BRIDGE), WOLVERINE HEAVY ASSAULT BRIDGE, CDT(CONTROLLED DAMAGE TESTING)

**System Description:**

Wolverine Heavy Assault Bridge (HAB).

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Tracked- Tank- HAB- Wolverine M1A2 SEP

**Reference** (Stevens et al., 2000):

Stevens, J., Moul, T., Dillen, M., Finkel, M., Hawley, B., Brabson, G., & Reza, J. (2000). System Evaluation Report (SER) for the System Evaluation Report for the Heavy Assault Bridge (HAB), XM104 (Wolverine) in Support of the Limited Fielding in-Process Review U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ECSTD, Ft. Hood, TX. DTIC ADB260255.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

130200 - Civil Engineering

Descriptors:

(U) \*FIELD TESTS, \*MILITARY BRIDGES, MOBILITY, LOGISTICS SUPPORT, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, MAINTAINABILITY, RELIABILITY, TRANSPORTABLE, SYSTEMS ANALYSIS

Identifiers:

(U) EXPORT CONTROL, XM-104 BRIDGE, ILS(INTEGRATED LOGISTICS SUPPORT), PVT(PRODUCTION VERIFICATION TESTS)

**System Description:**

The XM104 Wolverine system is built upon the M1A2 Abrams Tank chassis with system enhancement package upgrades, a 26-meter bridge, and launch mechanism. The system also includes a stabilization spade that provides support during bridge launching and also cleans accumulated mud, snow, and/or ice from the bridge to permit retrieval.

The system is designed to be capable of spanning gaps up to 24 meters wide to allow the crossing of 70-ton vehicles at 10 miles per hour (16 kilometers per hour). The bridge structure is designed to withstand 5,000 crossings of 70-ton vehicles and at least 1,100 launch and retrieve cycles without major repair. After positioning the launcher at the gap to be spanned, the system launches the bridge within 5 minutes through automatic sequencing of the launch mechanism using vehicle electronics controls from either of the crew stations. The total retrieval time requirement is less than 10 minutes, which includes 5 minutes for hookup and 5 minutes for transitioning to travel mode. The Wolverine has a redundant launch and retrieve capability which can use either hydraulic power from the vehicle's primary launch power unit (LPU) or hydraulic power from a backup pump on the vehicle's internal power pack as the secondary power source. As a back-up capability, launch may also be accomplished by slaving hydraulic power from another Wolverine.

The Wolverine is operated by a crew of two and is logistically compatible with the Abrams chassis. The HAB capabilities are comparable to the Abrams Tank in mobility and survivability. The program goal is for 90-percent commonality between the Wolverine and the Abrams chassis at the piece-part level.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Tracked- Tank- Patton M60A1E3

**Reference** (Blalock et al., 1979):

Blalock, D. N., Morgan, T. J., Scales, R. A., Wisdom, J. L., Smith, L. G., Ritchey, H. P., Morgan, T. J., Deleon, H., Nitzband, H. C., & Gedelman, J. (1979). System Evaluation Report (SER) for the M60A1E3 Tank IOC(U): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. TCATA DTIC ADC019522.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

190300 - Combat Vehicles

Descriptors:

(U) \*TANKS(COMBAT VEHICLES), MAINTENANCE, SIMULATION, PERFORMANCE TESTS, BATTLEFIELDS, MODIFICATION, TARGET ACQUISITION, FIRING TESTS(ORDNANCE), FIELD TESTS, FAILURE, LASERS, RELIABILITY, OPTICAL SIGHTS, PARTS, RANGE FINDING, GRENADE LAUNCHERS, SMOKE BOMBS

Identifiers:

(U) \*M60A1E3 TANKS, \*M-60 TANKS, M-239 GRENADE LAUNCHERS, M-21 FIRE CONTROL COMPUTERS, LASER RANGEFINDERS

**System Description:**

The M60A1E3 tank is an improvement of the M60A1 reliability improvement selected equipment (RISE) (passive) tank. The improvements include a laser rangefinder (LRF). an XM21 computer, an M239 smoke grenade launcher. the tank engine exhaust smoke system (TEESS). a driver night viewer (AN/VVS-2), and the tank thermal sight (TTS).

**Report Availability:**

Report Classification: Unclassified/FOUO. Declassified from Confidential to Unclassified 1 Mar 1994, per document markings. Distribution limited to U. S. Gov't. agencies only; Test and Evaluation; Oct 79. Other requests for this document must be referred to Commander, TRADOC Combined Arms Test Activity, Attn: ATCT-SPT-S. Fort Hood, TX 76544. :

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**System Short Name:** SER- Vehicle- Tracked- USMC AAV EFV

**Reference** (Ploskonka, 2004):

Ploskonka, D. (2004). System Assessment (SA) for the U.S. Marine Corps Advanced Amphibious Assault Vehicle Ballistic Hull and Turret Vulnerability Test (U): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report # 43587948. DTIC ADC071290. Report Classification: SECRET. Citation Classification: Unclassified.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

130601 - Surface Effect Vehicles & Amphibious Vehicles

190300 - Combat Vehicles

Descriptors:

(U) \*AMPHIBIOUS VEHICLES, \*TANK TURRETS, TEST AND EVALUATION, VULNERABILITY, COMBAT VEHICLES, HIGH EXPLOSIVES, HULLS(STRUCTURES), ANTITANK AMMUNITION

**System Description:**

U.S. Marine Corps Advanced Amphibious Assault Vehicle. Subsequent to this test effort the Advanced Amphibious Assault Vehicle was renamed the Expeditionary Fighting Vehicle.

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- VLAD

**Reference** (Fendick et al., 2004):

Fendick, K., Sokolis, B., & Leadore, G. (2004). System Evaluation Report (SER) for the Vehicle Lightweight Arresting Device (VLAD): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 43087919. DTIC ADB303793.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

130600 - Surface Transportation and Equipment

Descriptors:

(U) \*MILITARY VEHICLES, \*LIGHTWEIGHT, TEST AND EVALUATION, ACCEPTANCE TESTS, PORTABLE EQUIPMENT, OPERATIONAL EFFECTIVENESS, HUMAN FACTORS ENGINEERING, BARRIERS, GROUND VEHICLES

Identifiers:

(U) ORD(OPERATIONAL REQUIREMENTS DOCUMENT), PVAB(PORTABLE VEHICLE ARRESTING BARRIER), PQT(PRODUCTION QUALIFICATION TEST), TRANSPORTABILITY, VLAD(VEHICLE LIGHTWEIGHT ARRESTING DEVICE), RWD(REAR WHEEL DRIVE), MOPP(MISSION ORIENTED PROTECTIVE POSTURE), HMMWV(HIGH MOBILITY MULTIPURPOSE WHEELED VEHICLE), SOMTE(SOLDIER OPERATOR MAINTAINER TESTER EVALUATOR)

**System Description:**

The current VLAD candidate consists of a net forming a 2.9- by 6.1 meter rectangle weighing approximately 45 pounds, which comes folded in a 0.6- by 0.4- by 0.2-meter package. One edge of the long side of the net has two rows of barbed spikes (2 inches long) with large bases knotted into the rope. The net fiber consists of 1/4-inch thick cords made of Dyneema polyethylene. Four strips of 3-inch wide strapping or webbing are integrated lengthwise into the rope matrix to provide additional strength. The spikes are spaced so that several of them will perforate each of the front tires. The spikes are barbed to

help them remain embedded in the tire tread. The net is then pulled up and around the front wheels, which prevents the front axle from rotating and impedes steering.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Bridge- REBS

**Reference** (Link et al., 2006):

Link, R., Bindel, S., Merchant, D., Catalano, E., Sweeney, C., Saubier, L., & Hensley, S. (2006). System Assessment (SA) for the Rapidly Emplaced Bridge System (Rebs): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB315377.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

150600 - Military Operations, Strategy and Tactics

140200 - Test Facilities, Equipment and Methods

Descriptors:

(U) \*SYSTEMS ANALYSIS, \*MILITARY BRIDGES, \*RISK ANALYSIS, TEST AND EVALUATION, COMBAT EFFECTIVENESS, INTEGRATED SYSTEMS, SURVIVABILITY

Identifiers:

(U) REBS(RAPIDLY EMPLACED BRIDGE SYSTEM), SER(SYSTEM EVALUATION REPORTS) STRYKER

**System Description:**

The REBS is a self-deployable/retrievable tactical gapcrossing capability that can maintain pace and support the operational tempo of the SBCT. The bridge in place can provide nonnal crossings of MLC 30-wheeled and tracked-loads for singlelane traffic. The REBS consists of the following components:

- Transport pallet/flatrack.
- Launcher system (integrated into the pallet).
- Launch beam (integrated into each bridge half).
- A REB consisting of two bridge halves.
- Hydraulic system electrical control system.
- Diesel-hydraulic power source.
- Tooling and accessory kit.

The REB consists of two bridge halves, each consisting of two aluminum welded bridge quarters coupled together. The use of high-tensile aluminum results in low weight, along with resistance to corrosion. Each ramp (designed as a U-shaped structure) is open at the bottom to achieve the torsion flexibility required to provide for optimum adjustment of the ramp ends to the banks. The ramp end is closed at its bottom to establish the supporting surface on the bank to dissipate the forces generated by crossing vehicles. The two bridge halves of the REBS load on the transport pallet and integrated launcher, ready for travel on the M1977 Common Bridge Transporter (CBT). The M1977 CBT consists of a remanufactured and modified heavy expanded mobility tactical truck (HEMTT) equipped with a load handling system (LHS), which together are called the M1977 CBT host vehicle. The bridge deploys across a gap of up to 13 m with unprepared banks.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

**System Short Name:** SER- Vehicle- Wheeled- Cargo- 2 1/2 Ton ESP Van

**Reference** (Stolarz and Gadd, 1998):

Stolarz, B., & Gadd, J. (1998). System Evaluation Report (SER) for the 2 1/2 Ton Extended Service Program (ESP) Shop Van, M109A4: U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 82526062 / SEP 98-97. DTIC ADB237412.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

130600 - Surface Transportation and Equipment

130900 - Machinery and Tools

Descriptors:

(U) \*SHOPS(WORK AREAS), \*VANS, SURVIVABILITY, DECONTAMINATION, OPERATIONAL EFFECTIVENESS, MOBILE, SAFETY, SYSTEMS ANALYSIS, CHASSIS

Identifiers:

(U) \*SHOP VANS

**System Description:**

The M109A4 2-1/2-Ton ESP Shop Van is a follow-on effort to the M35A3 "2-1/2-Ton ESP Cargo Truck as part of "a refurbishment program of the 2-1/2-ton " vehicle fleet to enhance performance and supportability, and conform to safety and environmental standards. The M109A4 combines the chassis of the 2-1/2-Ton ESP Cargo Truck with the van body of the M109A3 Shop Van. The M109A3 currently uses the M44 2-1/2-Ton chassis which has exceeded its useful life and is unsupported. Approximately 38 vehicles will be fielded under this effort.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Cargo- Dump Truck M917A1

**Reference** (Stolarz and Stevens, 1998):

Stolarz, B., & Stevens, M. (1998). System Evaluation Report (SER) for the M917A1 Dump Truck, 18.5 Ton, 14 Cubic Yard: U.S. Army Test and Evaluation Command (ATEC) (Formerly U.S. Army Operational Test and Evaluation Command- OPTEC), ATTN: CSTE-EAC-CC, Park Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB233383.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

130300 - Construction Equipment, Materials & Supplies

130600 - Surface Transportation and Equipment

Descriptors:

(U) \*CONSTRUCTION EQUIPMENT, \*DUMP TRUCKS, COMPATIBILITY, TIRES, CHASSIS

Identifiers:

(U) \*M917A1 TRUCK, ENGINEERING EQUIPMENT, EVALUATION

**System Description:**

The M917A1 dump truck is a 6x6 vehicle having a gross vehicle weight of 68,000 pounds. It has a heavy duty steel dump body, with 18.5-ton, 12-cubic-yard capacity. The M917A1 has the same basic chassis

and drive train components as the M916A1 truck tractor (already fielded) but also has a central tire inflation system (CTIS) and air conditioning. The dump body on selected vehicles is equipped with a material control system (MCS) tailgate that replaces the standard tailgate assembly. The MCS provides the capability to distribute the payload material through four individually controlled gates. The M917A1 dump truck will be used by engineer units to load, transport, dump, and spread payloads of sand and gravel aggregates, crushed rock, hot paving mixes, earth, clay, mbble, and large boulders at engineering and construction sites.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Cargo- FMTV 10 Ton Dump Truck

**Reference** (Sykes et al., 2008):

Sykes, M., Powell, S., Horn, C., White, D., Bowman, J., Halcisak, S., Rouse, J., Harpel, B., Otsby, C., Fruge, K., Hirt, D., & Raymond, M. E. (2008). System Evaluation Report (SER) for the Family of Medium Tactical Vehicles A1 Rebuy (FMTV A1R) 10-Ton Dump Truck: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 8092100037. DTIC ADB337443.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

130600 - Surface Transportation and Equipment

Descriptors:

(U) \*MILITARY VEHICLES, \*TRUCKS, \*DUMP TRUCKS, ARMOR, VARIATIONS, TRAILERS, HANDLING, CHASSIS, MOLDINGS, MILITARY PROCUREMENT, SYSTEMS ANALYSIS, DRIVES, CONTRACTS

Identifiers:

(U) FMTV(FAMILIY OF MEDIUM TACTICAL VEHICLES)

**System Description:**

**FMTV Overview.** FMTV is a family of 2.5- and 5-ton capacity tactical wheeled vehicles built with a common chassis, truck cab, engine, and drive-train components. The total FMTV program objective is for 83,000 trucks and 25,000 trailers. A total of 22,418 FMTV trucks have been produced and fielded as A0 and A1 models. The current FMTV AIR contract mandated 27 relatively minor hardware changes from the existing FMTV A1 fleet and included procurement of the three new FMTV variants (i.e., Expansible Van, Load Handling System (LHS), and 10-Ton Dump). BAE (formerly Armor Holdings and Stewart and Stevenson ) produces the FMTV AIR. As of December 2007, 15,279 IFMTV AIR trucks have been produced. A total of 5,251 FMTV trailers have also been produced to date.

**Dump Variant Overview.** During FMTV A0 model production 256 5-Ton Dump and 189 Low Velocity Airdrop (LVAD) 5-ton Dump variants were produced, tested, and fielded. The new 10-Ton Dump variant was designed with numerous improvements over the previous FMTV 5-Ton Dumps. FMTV A1R improvements incorporated since FMTV A0 production were incorporated into the 10-Ton Dump along with increased payload capacity, improved dump bed durability, increased dump bed hydraulic lift capacity, and reduced overload I potential with the addition of a load sensor. The 10-Ton Dump variant uses the same common power train as other FMTV A1R 5-ton variants. The 10-Ton Dump bed is a slightly modified version of a commercially available dump bed built by Crysteel. The 14-foot dump bed has a single piece 1/4 inch thick 145 thousand pounds per square inch (ksi) steel floor and a 10-cubic yard capacity. The dump bed is raised by two hydraulic cylinders and has a lift capacity of 25 tons. The dump bed is operated from within the cab and is used to transport and spread aggregate (e.g., dirt, sand, gravel, rock, and construction debris) up to 20,000 pounds. A tiedown bar was welded to the dump bed exterior side walls to secure construction and Class V 3 material for transport. Additionally, a kit was

provided which when installed allows for transport of up to 12 Soldiers. Current plans are to produce and field 2,950 10-Ton Dump trucks. The 10-Ton Dump truck did not include LVAD requirements.

**Cab Armor Kit Overview.** The Low Signature Armored Cab (LSAC) is a replacement cab for FMTV variants fabricated with High Hard Steel (HHS) with Kevlar backing and ballistic glass to provide small arms and blast fragment protection for the crew. The LSAC kit includes an armored cab with air conditioner, 19,000-pound front axle with air over hydraulic braking (same as with Long Term Armor Strategy (LTAS)), and coil over shocks at the front axle to accommodate the additional armor weight. Approximately 2,035 LSAC kits have been installed on different FMTV models (i.e., A0, A1, A1R) and variants (i.e., cargo trucks, vans, tractors, and wreckers) in support of Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF). For each FMTV variant, a separate LSAC integration and expedited test to support a Safety Confirmation was conducted. LSAC with applique is a follow-on effort to bolt 12 plates of RHA over the LSAC cab to provide increased ballistic protection. The next generation of armor protection for FMTV is LTAS, which has completed the majority of its testing with cargo truck variants.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Cargo- FMTV EV

**Reference** (Sykes et al., 2006):

Sykes, M., Catalano, E., Horn, C., Emery, B., Halcisak, S., Raymond, M. E., Rouse, J., & Padgett, D. (2006). System Evaluation Report (SER) for the Family of Medium Tactical Vehicles A1 Rebuy (FMTV A1R) Expandable Van (EV) Variant: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. DTIC ADB322995.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

130600 - Surface Transportation and Equipment

130900 - Machinery and Tools

Descriptors:

(U) \*CARGO VEHICLES, TEST AND EVALUATION, DECISION MAKING, OPERATIONAL EFFECTIVENESS, COMBAT VEHICLES, MATERIALS HANDLING EQUIPMENT, ARMORED VEHICLES, CLASSIFICATION, MILITARY VEHICLES, ARMOR

Identifiers:

(U) SER(SYSTEM EVALUATION REPORT), FMTV(FAMILY OF MEDIUM TACTICAL VEHICLES), A1R(A1 REBUY), EV(EXPANSIBLE VAN), ARMOR KITS, LSAC(LOW SIGNATURE ARMORED CAB)

**System Description:**

FMTV is a family of 2 1/2-ton and 5-ton capacity tactical wheeled vehicles built with a common chassis, truck cab, engine, and drive-train components. The total FMTV program objective is for 83,000 trucks and 10,000 trailers. A total of 23,000 FMTV trucks and trailers have already been produced and fielded as A0 and A1 models. The current FMTV A1R contract mandated 27 relatively minor hardware changes from the existing FMTV A1 fleet and included procurement of the three new FMTV variants (i.e., EV, Load Handling System (LHS), and 10-Ton Dump). As of early October 2006, a total of 6,478 FMTV A1R trucks and 3,004 trailers have been produced. Armor Holdings, Inc. (includes recent acquisition of Stewart and Stevenson Tactical Vehicles Systems) produces the FMTV A1R and is the overall integrator for the EV. Association of American Railroads (AAR) Mobility Systems produces the EV body. The EV is mounted on the FMTV M1086 A1 (5-ton Long Wheel Base Cargo with Materiel Handling Equipment) chassis and will replace the current M934 EVs in a variety of different units. The van body expands with a manual hand crank to the required 1,450 cubic feet, has a payload capacity of 2.5 tons, and provides a climatically controlled work space with lighting (normal and blackout) and power outlets. The EV is issued to a variety of units, including maintenance and multifunctional logistics, medical, field artillery, military

police, and military intelligence. It is envisioned to be a mobile office used at various echelons in a field environment to support deploying units to a new theater of operations, establishing unit area of operations, relocating units to a new operating site, defending unit areas, providing field and sustainment maintenance and repair parts supply service, and redeploying units to home stations.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Cargo- FMTV LHS

**Reference** (Sykes et al., 2006):

Sykes, M., Catalano, E., Horn, C., Emery, B., Halcisak, S., Rouse, J., Jennings, S., & Raymond, M. E. (2006). System Evaluation Report (SER) for the Family of Medium Tactical Vehicles A1 Rebuy (FMTV A1R) Load Handling System (LHS) Variant: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 62779190. DTIC ADB321112.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

130600 - Surface Transportation and Equipment

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*CARGO VEHICLES, \*MILITARY VEHICLES, LOADING(HANDLING), TRAILERS, SYSTEMS ANALYSIS, TRUCKS

**System Description:**

FMTV is a family of 2½-ton and 5-ton capacity tactical wheeled vehicles built with a common chassis, truck cab, engine, and drive-train components. The total FMTV program objective is for 83,000 trucks and 10,000 trailers. A total of 23,000 FMTV trucks and trailers have already been produced and fielded as A0 and A1 models. The current FMTV AIR contract mandated 27 relatively minor hardware changes from the existing FMTV A1 fleet and included procurement of the three new FMTV variants (i.e., expandable van (EV), LHS, and 10-ton dump). As of early August 2006, 5,500 FMTV A1R trucks and 2,660 trailers have been produced. Armor Holdings, Inc. (includes recent acquisition of Stewart and Stevenson Tactical Vehicles Systems LP) produces the FMTV A1R and is the overall integrator for the LHS. Hiab Ltd. produces the unique handling components for the LHS, and Landoll Corporation produces the LHS trailer. The LHS variant consists of an LHS mounted on a medium tactical vehicle (MTV) M1089A1 Wrecker truck chassis and the companion LHS trailer. The LHS truck and trailer each have a payload rating of 8.8 tons (17,600 pounds). The FMTV LHS trailer is designed to load and unload bulk material from the truck and trailer using standard M1077, M1, and M3/M3A1 Flatracks. (M3/M3A1 is also known as a Container Roll-In/Out Platform (CROP)), 20-foot International Standards Organization (ISO) containers (8'x8'x20'), and Deployable Medical Systems (DEPMEDS). Flatracks are loaded without any support equipment, and ISO containers and DEPMEDS are loaded using the LHS lift frame. The FMTV LHS is similar in design to the M1075/M1076 Palletized Load System (PLS) Container Handling Unit truck and trailer, but the LHS is able to transport ISO containers and DEPMEDS without first loading them on a flatrack. The FMTV LHS will replace the current M1022/M1022A1 Dolly Wheeled Hydraulic System (Dolly Set) in medical units.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

**System Short Name:** SER- Vehicle- Wheeled- Cargo- FMTV LVAD

**Reference** (Sykes et al., 2007):

Sykes, M., Powell, S., Horn, C., Emery, B., Halcisak, S., Canty, H., Hirt, D., & Raymond, M. E. (2007). System Evaluation Report (SER) for the Family of Medium Tactical Vehicles (FMTV) A1 Low Velocity Airdrop (LVAD): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 8010100013. DTIC ADB334370.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

130600 - Surface Transportation and Equipment

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*TEST AND EVALUATION, \*AIR DROP OPERATIONS, \*TRUCKS, SURVIVABILITY, AUTOMOTIVE ENGINEERING, UTILITY VEHICLES, RIGGING, MAINTAINABILITY, RELIABILITY

Identifiers:

(U) \*LVAD(LOW VELOCITY AIRDROP), \*M1081A1 TRUCKS, \*M1093A1 TRUCKS, \*FMTV(FAMILY OF MEDIUM TACTICAL VEHICLES), PVT(PRODUCTION VERIFICATION TESTS), SUITABILITY, C-130 AIRCRAFT

**System Description:**

FMTV is a family of 2.5- and 5-ton capacity tactical wheeled vehicles built with a common chassis, truck cab, engine, and drive-train components. The total FMTV program objective is for 83,000 trucks and 10,000 trailers. A total of 22,418 FMTV trucks have already been produced and fielded as A0 and A1 models. The current FMTV A 1R contract mandated 27 relatively minor hardware changes from the existing FMTV A1 fleet and included procurement of the three new FMTV variants (i.e., Expansible Van, Load Handling System (LHS), and 10-Ton Dump). BAE (formerly Armor Holdings and Stewart and Stevenson ) produces the FMTV AIR. As of November 2007, 10,430 FMTV AIR trucks have been produced. A total of 4,931 FMTV trailers have also been produced to date. The FMTV LVAD cargo trucks differ from the other cargo trucks, due to modifications made to meet airdrop requirements. These modifications include a removable cab top, folding cab walls, folding windshield, and parachute suspension assembly in the cargo bed. With the cab roof removed and cab walls and windshield folded down, the overall height of a LVAD vehicle rigged for airdrop is less than 100 inches to meet aircraft extraction requirements. During FMTV A0 production LVAD 2.5 and 5 ton cargo and dump trucks were previously tested, airdrop certified, and competed fielding in FY97. The primary modifications made since previous LVAD production were the new EPA engine, transmission upgrade, 260-amp alternator, anti-lock brakes, new windshield bumper rests on front bumper, front engine mounting bracket, new rear cab support, and top feed axle. The FMTV A1 LVAD 2.5-ton cargo truck nomenclature is M1081A1 and the LVAD 5-ton cargo truck is a M1093A1. Current plans are to produce and field 216 M1081A1s and 216 M1093A1s to the 18th Airborne Corps.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Cargo- HEMTT-LHS

**Reference** (Brown et al., 2000):

Brown, P. L., Rouse, J. M., Cieslak, A. J., Fujiwara, M. F., & Myers, J. F. (2000). System Evaluation Report (SER) for the XM1120 Heavy Expanded Mobility Tactical Truck-Load Handling System (HEMTT-

LHS): U.S. Army Evaluation Center (AEC), Aberdeen Proving Ground, MD. Report #: 11138441. DTIC ADB265477.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

150500 - Logistics, Military Facilities and Supplies

190300 - Combat Vehicles

Descriptors:

(U) \*LOADING(HANDLING), \*MILITARY VEHICLES, \*TRUCKS, TEST AND EVALUATION, SURVIVABILITY, OPERATIONAL EFFECTIVENESS

Identifiers:

(U) HEMTT(HEAVY EXPANDED MOBILITY TACTICAL TRUCK), XM-1120 TRUCK

**System Description:**

The HEMTT-LHS system consists of a mature tactical wheeled vehicle chassis, the M977 HEMTT with upgraded rear springs, the PLS LHS, the North Atlantic Treaty Organization (NATO) standard M1077 Flatrack and M3/M3A1 Container Rollin/ Out Platform (CROP), and the M1076 PLS trailer. Each HEMTT-LHS component is a fully developed and TC-Standard/Materiel Released and fielded vehicle or system subcomponent. The risk involved in the program relates to the integration of these major components and subsystems to meet the required technical characteristics and to capture existing PLS capabilities on the HEMTT series trucks.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Cargo- Trailer- CBC

**Reference** (Brown et al., 2000):

Brown, P. L., Riddick, R. L., Finkel, M. G., Fujiwara, M. M., & Hannah, L. T. (2000). System Evaluation Report (SER) for the M105A2 1 1/2-Ton Cargo Trailer Cargo Bed Cover (CBC): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 02568289. DTIC ADB257630.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

130600 - Surface Transportation and Equipment

Descriptors:

(U) \*PORTABLE SHELTERS, \*CARGO VEHICLES, \*MILITARY VEHICLES, \*TRAILERS, \*VEHICLE EQUIPMENT, TEST AND EVALUATION, SURVIVABILITY, OPERATIONAL EFFECTIVENESS

Identifiers:

(U) M-105A2 TRAILER

**System Description:**

The M105A2 Trailer CBC is a removable, box-like shelter designed to protect, store, and secure equipment, tools, and pilferable supplies while being transported on the M105A2 1 1/2-Ton Cargo Trailer. It is not used to transport personnel; however, once deployed, it can be used as a work area. The CBC is mountable on and removable from the cargo bed of the M105A2 by the owning unit, using organizational-level maintenance top lift capabilities. The CBC is rigid; made of "rib stiffened" fiberglass reinforced plastic (FRP) with an integral floor; has a lockable rear door, an escape hatch, dual vent ports, and the maximum internal volume that the M105A2 cargo bed will allow. It does not require special tools to install, remove, or attach. Periodic maintenance consists of a daily inspection (when in use), before, during, and after

preventive maintenance checks and services (PMCS), and inspection after field training exercises. Repair of minor structural damage will be accomplished at the direct support maintenance level. No maintenance is envisioned for general support or depot levels.

The family of CBCs is being developed in response to an immediate need within Army units for lightweight, removable, and inexpensive shelters for tactical wheeled vehicles (TWVs), including the M105A2 Trailer. Shelters are needed by combat, combat support, and combat service support units to transport, store, and safeguard their repair parts, maintenance tools, petroleum products, mission-essential equipment, and all classes of supply. Shelters are also needed for the general transport of other items to include military working dogs, official mail, and distribution. Shelters of this type must meet the operational needs of the using unit as well as DA transportability and physical security requirements. Built-up shelters will maximize the capability to conduct substantive and effective operations while minimizing the cost. Alternatives such as existing Department of Defense shelters do not meet the requirements due to cost and deployability, and locally fabricated built-up shelters are nonstandard, unstable, bulky, costly, nondeployable, and often unsafe. CBCs will be operated worldwide with their companion vehicles by the full spectrum of combat, combat support, and combat service support units. They will be used with their companion vehicles on all surface types of primary and secondary roads as well as cross-country terrain. They will be used in temperatures from -60 to 120 deg F. They will be exposed to the same threats as their companion vehicles.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Cargo- Trailer- LTT-R

**Reference** (Rymarz, 2005):

Rymarz, S. (2005). System Evaluation Report (SER) for the Light Tactical Trailer-Rebuy (LTT-R) Program / Abbreviated (ASER): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. DTIC ADB307271.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)  
Fields and Groups:

120400 - Operations Research

130600 - Surface Transportation and Equipment

Descriptors:

(U) \*TRAILERS, \*SYSTEMS ANALYSIS, HIGH RATE, SURVIVABILITY, TRANSPORTABLE, RELEASE, FRICTION

Identifiers:

(U) LTT-R(LIGHT TACTICAL TRAILER-REBUY), HMT(HIGH MOBILITY TRAILER), ASER (ABBREVIATED SYSTEM EVALUATION REPORT)

**System Description:**

The LTT-R is considered to be effective and suitable and ready for full materiel release provided the improved friction material is incorporated in the LTT Technical Data Package (TDP) and LTT-R production. No formal survivability requirements for the LTT-R exist. The LTT-R is fully capable of performing its intended mission and is equal to the fielded High Mobility Trailer (HMT) in performance and reliability.

(1) The M1101, M1102, and chassis are highly mobile, all-terrain trailers capable of operating on cross-country, unimproved roads, and improved roads. These are compatible with the HMMWV throughout the HMMWV Mission Profile with minimal degradation of system performance.

(2) The LTT-R series includes the following variants:

MODEL NUMBER      NOMENCLATURE

M1101                      Cargo Trailer, Light, 3;400 lbs GVW  
M1102                      Cargo Trailer, Heavy; 4200 lbs GVW  
Chassis                    Chassis Trailer, 4200 lbs GVW  
NOTE: GVW - gross vehicle weight

(3) The LTT-R program is the second reprocurienient of the HMT. The first reprocurement was the LTT program and was limited to 1 year and a quantity ceiling of 1,032 trailers. This reprocurement extends over the next 5 years with a ceiling of 12,805 trailers. The nomenclature for the HMT was changed to LTT during the second quarter FY03. No changes to user requirements, hardware cOIJ.figuration, trailer national stock numbers (NSNs), technical manuals (TMs), or model numbers are associated with this nomenclature change. The LTT-R is being:procured based on the HMT level III Technical Data Package (TDP). The requirements for the LTT-R program are based on the existing HMT requirements. Based on the fact that the selected manufacturer has not produced the HMTILTT within the last 2 years, a new materiel release decision is warranted.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Cargo- Truck Tractor M915A3

**Reference** (Stolarz et al., 2000):

Stolarz, B., Cieslak, A., Mackenzie, M., Harrison, L., & Strawbridge, D. (2000). System Evaluation Report (SER) for the M915A3 Truck Tractor. Line Haul: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 10128363. DTIC ADB261517.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

130600 - Surface Transportation and Equipment

Descriptors:

(U) \*TEST AND EVALUATION, \*TRUCKS, MILITARY VEHICLES, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT

Identifiers:

(U) M915A3 VEHICLE

**System Description:**

The M915A3 is a 6x4 line haul truck tractor with a two-passenger cab powered by a Detroit Diesel electronic controlled (DDEC) IV 435 horsepower diesel engine, Allison model HD4560P six-speed electronic-controlled automatic transmission, Meritor axles, Freightliner Tuf Trac suspension, antilock brakes, air conditioning, an Eaton VORAD collision warning system, and a Holland Hitch 2-inch sliding fifth wheel with a Teflon face insert. It has a gross vehicle weight rating (GVWR) of 52,000 pounds, a gross combination vehicle weight (GCVW) rating of 105,000 pounds, and a fifth wheel capacity of 30,000 pounds. The M915A3 primarily tows the M871 22 1/2.-ton flatbed semitrailer, the M872 34-ton flatbed semitrailer, and the M1062/A1 7,500-gallon fuel tanker.

Other configuration enhancements to the M915A3 since fielding of the M915A2 include: axle ratio change from 4.56 to 5.29 for improved pulling power (with some reduction of top speed); hub-piloted wheels for increased clamping force from lug nuts (reduce likelihood of lug nuts loosening); driver-controlled differential locks for improved traction; adjustable tilt steering to accommodate different size drivers; Webasto heater kit (replaces Southwind heater kit) for low temperature operations; heated "west coast" style rearview mirrors for improved visibility; battery cut-off switch for safety, ease of maintenance, and prolonged battery life; electrical connections for driver's vision enhancer (DVE), movement tracking system (MTS), and identifying friend or foe (IFF).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Cargo- Truck Tractor M915A4

**Reference (Stolarz, 1999):**

Stolarz, B. (1999). System Evaluation Report (SER) for the M915a4 Truck Tractor Upgrade Program: U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 92428124. DTIC ADB246541.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

130600 - Surface Transportation and Equipment

140200 - Test Facilities, Equipment and Methods

Descriptors:

(U) \*LOGISTICS SUPPORT, \*TRUCKS, \*MILITARY PROCUREMENT, \*TRACTORS, MANUFACTURING, DECISION MAKING, PERFORMANCE TESTS, TEST EQUIPMENT, ENDURANCE(GENERAL), FUEL TANKS, MAINTENANCE MANAGEMENT

Identifiers:

(U) EXPORT CONTROL

**System Description:**

The M915A4 is a 6x4 line haul truck tractor with a two passenger cab powered by a Cummins Big Cam I (or Big Cam III) 400 horsepower diesel engine, Allison model 4560P electronic automatic transmission, Rockwell axles and a Holland Hitch 2-inch sliding fifth wheel. It has a gross vehicle weight rating (GVWR) of 52,000 pounds, a gross combination vehicle weight (GCVW) rating of 105,000 pounds and a fifth wheel capacity of 30,000 pounds. The M915A4 primarily tows the M871 22-1/2-ton flatbed semitrailer, the M872 34-ton flatbed semitrailer, and the M1062/A1 7500 and 9200-gallon fuel tanker.

The M915A4 upgrade configuration contains specific features to extend its mission capable life and reduce life cycle costs. The program retains those components which still have significant serviceable life and replaces those components and assemblies which have significant wear, are unserviceable or require excessive manhours and cost to maintain. The only components to be retained are the dressed engine, rear boggy axle, pintle, and batteries. This group of new components is referred to as the upgrade kit. The upgrade kit resolves the three primary areas of hardware deficiency causing non-mission capable status, i.e., the transmission, cab, and electrical system. The existing Caterpillar 7155 power shift transmission is replaced with a fully automatic transmission, the metal cab is replaced with a corrosion-resistant cab, and the new wiring harness contains water-proof quick disconnect couplers. A collision warning system, anti-lock brake system (ABS), and air conditioning were added to enhance safety and operator comfort.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Cargo- Water Trailer XM1112

**Reference (Stolarz et al., 1999):**

Stolarz, B., Cieslak, A., & Fujiwara, M. (1999). System Evaluation Report (SER) for the XM1112 Water Trailer, 400-Gallon, 8-Wheeled: U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 91328030. DTIC ADB243554.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

130600 - Surface Transportation and Equipment

Descriptors:

(U) \*TRAILERS, TEST AND EVALUATION, ACCEPTANCE TESTS, STABILITY, MOBILITY, TERRAIN, SUSPENSION DEVICES, ROUGHNESS, CHASSIS, WATER TANKS

Identifiers:

(U) XM1112 WATER TRAILER, PQT(PRODUCTION QUALIFICATION TEST)

**System Description:**

The XM1112 incorporates a walking beam suspension system intended to provide greater mobility and stability than the M149-series water trailer when traversing rough terrain. It has eight tires with each set bridged to a central structural beam. It has leaf-spring suspension, air-over-hydraulic service brake system, and a handoperated parking brake. The 400-gallon stainless steel water tank is the same as that used on the M149A2. The trailer is equipped with fenders, a 24-volt electrical system, and tail, stop, and blackout lights.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Crane- ATEC

**Reference** (Dillen et al., 1998):

Dillen, M., Stevens, J., & Knuckels, S. (1998). System Evaluation Report (SER) for the All-Terrain Crane (ATEC): U.S. Army Evaluation Analysis Center (EAC)., ATTN: CSTE-EAC-AV/CS, Aberdeen Proving Ground, MD 21005-3013. DTIC ADB238957.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

131300 - Structural Engineering and Building Technology

Descriptors:

(U) \*TEST AND EVALUATION, \*CLASSIFICATION, \*CRANES, TEMPERATURE, LOGISTICS SUPPORT, MATERIEL, RECOVERY, INTEGRATED SYSTEMS, PRODUCTION, SURVIVABILITY, PERFORMANCE TESTS, CONTRACTORS, TERRAIN, HUMAN FACTORS ENGINEERING, ELECTROMAGNETIC INTERFERENCE, TRANSPORTABLE, RELEASE, SYSTEMS ANALYSIS, TEST FACILITIES

**System Description:**

The ATEC is a Grove AT400 Series Crane powered by a Cummins 5.9L 6BTA engine coupled to a six-speed electronically controlled transmission. Planetary drive axles provide four-wheel drive capability. The crane is a high-mobility, pneumatic-tired vehicle with a fully revolving superstructure and cab and hydraulically powered telescoping boom. The crane is capable of operating with a hydraulic clamshell, a hydraulic grapple, pile drivers, and a concrete bucket.

**Report Availability:**

Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Engineer- Forklift- ATLAS

**Reference** (Valentine et al., 1998):

Valentine, J., Fujiwara, M., Cieslak, A., Reid, M., & Jastrab, G. (1998). System Evaluation Report (SER) for the All-Terrain Lifter, Army System (ATLAS): U.S. Army Operational Test and Evaluation Comd., ATTN: CSTE-XXX-XXX, Part Center IV, 4501 Ford Ave., Alexandria, VA 22302-1458. USAEAC, APG, MD. Report #: 82526063 / SER 98-06. DTIC ADB236314.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

140200 - Test Facilities, Equipment and Methods

150600 - Military Operations, Strategy and Tactics

Descriptors:

(U) \*MILITARY REQUIREMENTS, \*TEST EQUIPMENT, \*ARMY EQUIPMENT, \*FORKLIFT VEHICLES, MILITARY STANDARDS, CLASSIFICATION, GROUND VEHICLES, SYSTEMS ANALYSIS, ARMY OPERATIONS, REGULATIONS

Identifiers:

(U) ATLAS(ALL TERRAIN LIFTER ARMY SYSTEM), ARMY REGULATION 700 142

**System Description:**

The ATLAS is an integrated, rough terrain forklift for Combat Service (CS) and Combat Service Support (CSS) units with C130 air deployability, rough terrain mobility, and the ability to stuff and unstuff 20-foot International Standardization Organization (ISO) containers. It is capable of lifting the following loads at the reach requirements specified: 4,000 pounds at 21.5 feet, 6,000 pounds at 13 feet, and 10,000 pounds at 4 feet. It is capable of speeds of 23 miles per hour (mph) minimum; can complete day and night operation in all expected weather conditions; is operable in surf zones at depths of 30-36 inches; and is operable and maintainable in basic, hot, and cold climates. (Cold operations require an arctic kit.)

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Engineer- HMEE

**Reference** (Mikolinis, 2008):

Mikolinis, T. E. (2008). Operational Test Agency Evaluation Report (OER) for the High Mobility Engineer Excavator (HMEE) Type I System: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. ARMY EVALUATION CENTER ALEXANDRIA VA. DTIC ADB343232.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA), OTA Assessment Report (OAR), OTA Milestone "x" Assessment Report (OMAR), OTA Evaluation Report (OER), OTA Follow-on Evaluation Report (OFER), Operational Test Report (OTR), Abbreviated Operational Test Report (AOTR), Army Input to the OTA Report (AIOR)

\*earth handling equipment, \*test and evaluation, modification kits, excavation, survivability, armor, operational effectiveness

\*hmee type i, \*excavators, hmee(high mobility engineer excavator), suitability, cpk(crew protection kit)  
Fields and Groups:

130300 - Construction Equipment, Materials & Supplies

Descriptors:

(U) \*EARTH HANDLING EQUIPMENT, \*TEST AND EVALUATION, MODIFICATION KITS,  
EXCAVATION, SURVIVABILITY, ARMOR, OPERATIONAL EFFECTIVENESS

Identifiers:

(U) \*HMEE TYPE I, \*EXCAVATORS, HMEE(HIGH MOBILITY ENGINEER EXCAVATOR), SUITABILITY,  
CPK(CREW PROTECTION KIT)

**System Description:**

The HMEE Type I is an ACAT III, NDI program that supports the heavy combat engineer excavation requirements of the U.S. Army. The HMEE Type I base system, non-armored weight not to exceed 26,000 pounds, is an all-wheel-drive, diesel engine, general construction vehicle with precision excavation, lift and load, and forklift capabilities, and can use a variety of other special-purpose attachments (snow plow, rotary sweeper, crane, dump body, roto-tiller, liquid dispenser, sandbag filler, etc.) as identified by the receiving unit's mission. The system has a hydraulic capability to operate a rock drill, chain saw, tamper/ compactor, pavement breaker, picket driver, and other tools as necessary to support the unit mission. The HMEE Type I will be used for ditching, trenching, loading, lifting, and other related operations supporting unit mobility, counter mobility, survivability, and general engineer missions and have standard military lifting and tie-down provisions required for worldwide deployment by highway, rail, air, and marine modes of transport. The HMEE Type I system is a highly mobile, self-deployable excavator system, is compatible with current Test, Measurement, and Diagnostic Equipment, and has limited operational capability in a HEMP or a nuclear, biological and chemical contamination survivability environment. The environmentally conditioned cab in the base systems and the armored CPK are suitable for employment in all required operating environments. Military modifications include:

- A NATO slave receptacle (24 volts).
- A mounting bracket for the operator's defensive weapon.
- Blackout drive lights.
- Chemical agent resistive coating (CARC) paint.
- Standard military lifting and tie-down provisions.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Engineer- I-HMEE

**Reference** (Smyers et al., 2002):

Smyers, P., Landy, K., Matthews, S., Fujiwara, M., & Mallamo, J. (2002). System Assessment (SA) for the Interim High Mobility Engineer Excavator (I-HMEE): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB275401.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)  
Fields and Groups:

130600 - Surface Transportation and Equipment

Descriptors:

(U) \*ACCEPTANCE TESTS, \*VEHICLES, \*EXCAVATION, TEST AND EVALUATION, REQUIREMENTS,  
MANAGEMENT PLANNING AND CONTROL, ACQUISITION, PRODUCTION, HUMAN FACTORS  
ENGINEERING, SAFETY, CLASSIFICATION, PROCUREMENT, USER NEEDS, SYSTEMS ANALYSIS

Identifiers:

(U) I-HMEE(INTERIM HIGH MOBILITY ENGINEER EXCAVATOR)

**System Description:**

The I-HMEE is an Acquisition Category III, Commercial-Off-The-Shelf (COTS) program that will support the heavy excavation requirements of the Interim Brigade Combat Team (IBCT). The I-HMEE, weighing 30,000 pounds maximum, will be an all-wheel-drive, diesel engine, general construction vehicle available with a backhoe, bucket loader, and forklift as well as other special-purpose attachments. The I-HMEE can be used for ditching, trenching, loading, and other related combat engineer missions. The I-HMEE must be deployable worldwide by highway, rail, air, and marine modes of transportation. It shall have standard military lifting and tie-down provisions.

The I-HMEE candidate presented for testing and assessment is the HSEV that is currently in production for use by the Australian Army. The HSEV was tested by the U.S. Army in November 1988 in a limited user experiment with the Canadian Armed Forces. The HSEV is a medium weight, hydraulically controlled excavation system with all-terrain capability. Attachments include the forklift, the 4-in-1 multi-function bucket (utility bucket, clam shell, dozing blade, and lift platform) and the rear mounted backhoe. [Note: the 4-in-1 bucket will be purchased in lieu of a front-end loader.] Other attachments are also available. All attachments, both front and rear mounted, can be operated from the driver's position. The HSEV is capable of speeds up to 65 mph on improved roads.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Engineer- I-HMEE

**Reference (Smyers, 2003):**

Smyers, P. (2003). System Evaluation Report (SER) for the Interim High Mobility Engineer Excavator (I-HMEE) (Phase II): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 32248846. DTIC ADB291362.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

130300 - Construction Equipment, Materials & Supplies

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*MILITARY VEHICLES, \*FORKLIFT VEHICLES, TEST AND EVALUATION, DIESEL ENGINES, RELIABILITY, DRAINAGE, LOADERS, MISSIONS, SYSTEMS ANALYSIS, EXCAVATION, MILITARY ENGINEERING

Identifiers:

(U) \*I HMEE(INTERIM HIGH MOBILITY ENGINEER EXCAVATOR), ALL WHEEL DRIVE VEHICLE, CONSTRUCTION VEHICLE, BACKHOE, BUCKET LOADER, SEE(SMALL EMPLACEMENT EXCAVATOR), EXCAVATORS, SBCT(STRYKER BRIGADE COMBAT TEAM), ORD(OPERATIONAL REQUIREMENTS DOCUMENT)

**System Description:**

The I-HMEE, weighing 30,000 pounds maximum, is an all-wheel-drive, diesel engine, and general construction vehicle available with a backhoe, bucket loader, and forklift as well as other special-purpose attachments. The I-HMEE is an Acquisition Category III COTS program that will support the heavy excavation requirements of the SBCT. The I-HMEE, weighing 30,000 pounds maximum, is an all-wheel-drive, diesel engine, and general construction vehicle available with a backhoe, bucket loader, and forklift as well as other special-purpose attachments. The I-HMEE can be used for ditching, trenching, loading, and other related combat engineer missions. The I-HMEE is deployable worldwide by highway, rail, air, and marine modes of transportation. It has standard military lifting and tie-down provisions. The I-HMEE will be operated in all types of environments and terrain, across the full spectrum of military operations.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Engineer- Trailer- Towed Roller

**Reference** (Brooks and Knuckles, 1998):

Brooks, C. W., Jr., & Knuckles, S. (1998). System Assessment (SA) for the Towed Roller, Pneumatic Tire, Hopper Body, Oscillating Wheels (R03402): U.S. Army Evaluation Analysis Center (EAC)., ATTN: CSTE-AEC-AV/CS, Aberdeen Proving Ground, MD 21005-3013. DTIC ADB233213.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

130300 - Construction Equipment, Materials & Supplies

**System Description:**

The towed roller is a soil compactor consisting of a hopper with pneumatic tires, oscillating wheels. The roller is capable of compacting soil with an operating ballast weight of from 4,600 to 20,300 pounds. It is capable of being transported worldwide by highway, rail, marine, and air modes to include the ability to be airdropped by C-130 or larger aircraft and externally air transported by CH-47 and UH-60 helicopters. The towed roller is a commercial product modified with military sling and tie-down provisions..

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Engineer- Vibration Roller

**Reference** (Dillen et al., 2000):

Dillen, M., Stevens, J., & Knuckles, S. (2000). System Evaluation Report (SER) for the Vibration Roller: U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADB252067.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

130300 - Construction Equipment, Materials & Supplies

Descriptors:

(U) \*TRACTORS, \*CONSTRUCTION EQUIPMENT, TEST AND EVALUATION, VIBRATION, LOGISTICS SUPPORT, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, HUMAN FACTORS ENGINEERING, ARMY EQUIPMENT, LIGHTWEIGHT, SYSTEMS ANALYSIS, ROLLERS, COMPACTING, SELF PROPELLED

Identifiers:

(U) \*VIBRATORY ROLLERS, EXPORT CONTROL

**System Description:**

Types I and III Vibratory Rollers are lightweight (16,000 to 18,000 pounds), self-propelled Caterpillar systems powered by a four-cylinder, turbocharged diesel engine. The Rollers incorporate a 24-volt direct

electrical starting system and hydrostatic drive of both rear axle and drum through dual variable displacement piston pumps and separate dual displacement piston motors. The articulated frame is steered with hydraulic power steering and the rear axle incorporates a no-spin differential. Safety features include a roll-over protective structure (ROPS), falling object protective system (FOPS), back-up alarm, seat belt, and halogen headlights. The compacting function is accomplished with a dual-amplitude/variable frequency vibratory system, using either a smooth drum or a bolt-on pad foot drum. The Type III Roller is the same as the Type I Roller except that it is air-droppable and has interchangeable smooth and pad foot drums (instead of a bolt-on pad foot drum).

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- FMTV- CK

**Reference** (Dunn et al., 1998):

Dunn, N., Beran, B., Finkel, M., Fujiwara, M., Lewis, P., Reid, J., & Evaro, V. (1998). System Evaluation Report (SER) for the Containerized Kitchen (CK) (Type Classification-Generic): U.S. Army Evaluation Analysis Center (EAC)., ATTN: CSTE-EAC-AV/CS, Aberdeen Proving Ground, MD 21005-3013. DTIC ADB233859.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

060800 - Food, Food Service and Nutrition

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*TRANSPORTABLE, \*KITCHENS, PORTABLE EQUIPMENT, ARMY FACILITIES, MEALS, ARMY OPERATIONS, FOOD SERVICE, KITCHEN EQUIPMENT AND SUPPLIES, CONTAINERIZING

Identifiers:

(U) CONTAINERIZED KITCHEN

**System Description:**

The CK will be the next-generation field kitchen capable of feeding up to 550 soldiers. The CK will utilize MIL-STD field tables, griddles, cook pot cradles, field ovens, steam tables, burners, and cooling racks. These items will be integrated with nondevelopmental item (NDI) components using new technologies in refrigeration and power generators. All of these items will be sheltered within a hybrid expandable International Organization for Standardization (ISO) container and placed on top of a modified M1073 trailer towable by the new Family of Medium Tactical Vehicles (FMTV) 5-ton.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- FTTS MSV

**Reference** (Sykes et al., 2007):

Sykes, M., White, D., Emery, B., Koch, S., Barnhart, D., Hilton, K., Ingram, D., Nicholson, N., Wise, B., Martish, J., Raymond, M. E., & Forbes, K. (2007). System Assessment (SA) for the Future Tactical Truck System (FTTS) Maneuver Sustainment Vehicle (MSV) Advanced Concept Technical Demonstration: U.S.

Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB331855.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

130600 - Surface Transportation and Equipment

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*MOBILITY, \*SURVIVABILITY, \*SYSTEMS ANALYSIS, \*UTILITY VEHICLES, \*MAINTAINABILITY, \*TRUCKS, TEST AND EVALUATION, DEMONSTRATIONS, ERGONOMICS, MATERIALS HANDLING EQUIPMENT, COMMAND CONTROL COMMUNICATIONS

Identifiers:

(U) \*TWV(TACTICAL WHEELED VEHICLES), \*MSV(MANUEVER SUSTAINMENT VEHICLE), FTTS(FUTURE TACTICAL TRUCK SYSTEM), TRANSPORTABILITY, NETWORK CENTRICITY, SUSTAINMENT

**System Description:**

The FTTS MSV is a technology demonstrator vehicle developed by Armor Holdings with a payload capacity of approximately 13 short tons (ST), similar to the Heavy Expanded Mobility Tactical Truck (HEMTT). The MSV is a two-axle steer TWV with four axles (8 x 8), is equipped with air-over hydraulic brakes, has a diesel engine/hybrid-electric drive system, and is equipped with Material Handling Equipment (MHE). The MHE includes a telescoping boom crane, forklift attachment, and Load Handling System (LHS). The hybrid-electric motor components include four high voltage battery packs and ancillary high voltage components. The cab of the truck is an FTTS cab that has integral ballistic and mine-blast protection. The MSV also includes a Companion Trailer (CT). Both the MSV and CT are capable of carrying flatracks, each with a 13-ton payload.

The CT has its own onboard diesel engine and can be operated in an autonomous mode, of the prime mover at low speeds by a remote control unit. The CT is a three-axle trailer that steers with both the first and third axles.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- FTTS UV IMG

**Reference** (Rymarz et al., 2007):

Rymarz, G., Ingram, D., Koch, S., Emery, B., White, D., Nicholson, N., Strawbridge, D., Martish, J., & Brewer, G. (2007). System Assessment (SA) for the Future Tactical Truck System (FTTS) Utility Vehicle (UV) International Military Group (IMG) Advanced Concept Technical Demonstration (ACTD): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB333808.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA) Fields and Groups:

140200 - Test Facilities, Equipment and Methods

190300 - Combat Vehicles

Descriptors:

(U) \*TEST AND EVALUATION, \*TRUCKS, \*UTILITY VEHICLES, HUMAN FACTORS ENGINEERING, RANGE(DISTANCE), TECHNOLOGY ASSESSMENT, TACTICAL WARFARE, SAFETY, TRANSPORTABLE

Identifiers:

(U) \*UV(UTILITY VEHICLES), FTTS(FUTURE TACTICAL TRUCK SYSTEMS), TWV(TACTICAL WHEELED VEHICLES)

**System Description:**

The IMG UV is the manufacturer's solution to an ACTD vehicle program that explores the latest technology and design options available for a light tactical vehicle capable of providing the responsiveness, deployability, ability, versatility, survivability, and sustainability required by the Future Combat Systems (FCSs). Some features of the International FTTS-UV truck are:

- \* Mid-engine design.
- \* All-wheel drive.
- \* Pneumatically locking transfer case and differentials.
- \* Four-wheel steering.
- \* Carbon dioxide-based air conditioning system.
- \* Material handling crane.
- \* Four-wheel independent torsion bar suspension with adjustable ride height.
- \* Hydraulically actuated disc brakes.
- \* Anti-lock Brake System (ABS).
- \* Automatic Fire Extinguishing System (AFES).
- \* Central Tire Inflation System (CTIS).
- \* Gross vehicle weight (GVW) of 22,000 pounds.

The International FTTS-UV uses a common chassis and unique mission modules to support a variety of mission roles including C2; ambulance; and other support roles such as the transporting of materials, weapon systems, equipment, and personnel. While supporting mission operations, the International FTTS-UV is required to perform on primary and secondary roads, trails, and off-road terrain. The International FTTS-UV is capable of fording water and operating in extreme hot and cold temperatures. With the application of kits, the vehicles are also capable of Artic operation and deep-water fording. The IMG UV truck is powered by a parallel diesel-electric, hybrid drive train consisting of a 100-kilowatt electric generator/motor and an International 3.0-liter, four-cylinder diesel engine routing power through a five-speed automatic transmission and two-speed transfer case. These two engines can operate independent of each other or combine to produce approximately 387 horsepower and 564 foot-pounds of torque.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- FTTS UV LM

**Reference** (Rymarz et al., 2007):

Rymarz, G., Ingram, D., Nicholson, N., Koch, S., Emery, B., White, D., Strawbridge, D., Martish, J., & Brewer, G. (2007). System Assessment (SA) for the Future Tactical Truck System (FTTS) Utility Vehicle (UV) Lockheed Martin (Lm) Advanced Concept Technical Demonstration (ACTD): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. DTIC ADB333807.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

**System Description:**

a. The LM FTTS-UV is the manufacturer's solution to an ACTD vehicle program that explores the latest technology and design options available for a light tactical vehicle capable of providing the responsiveness, deployability, ability, versatility, survivability, and sustainability required by the Future Combat Systems. Some features of the LM FTTS-UV truck are:

- space-frame design.

- all-wheel drive.
- combined rear differential/transfer case assembly.
- 18,000-pound hydraulic winch.
- material handling crane.
- four-wheel independent suspension.
- air-bag springs with leveling and adjustable ride height.
- dual shocks at each wheel station.
- air modulated hydraulic disc brakes.
- Anti-lock Brake System (ABS).
- a gross vehicle weight (GVW) of 25,000 pounds.

The LM FTTS-UV uses a common chassis and unique mission modules to support a variety of mission roles including C2, ambulance, and other support roles such as the transporting of materials, weapon systems, equipment, and personnel. While supporting mission operations, the LM UV is required to perform on primary and secondary roads, trails, and off-road terrain. The LM UV is capable of fording water and operating in extreme hot and cold temperatures. With the application of kits, the vehicles are also capable of arctic operation and deep-water fording.

b. The LM FTTS-UV truck is powered by a parallel hybrid drive train consisting of a 44 kilowatt electric motor and a Cummings 5.9-liter, six-cylinder diesel engine routing power through a six-speed, computer-controlled autoshift transmission and two-speed transfer case. These two engines can operate independent of each other or combine to produce approximately 400 horsepower (HP) and 780 foot-pounds of torque. There are two sets of batteries in the vehicle, a small set of lead acid batteries, and the main hybrid battery. The main electrical breaker switch located behind the driver seat can be used to mechanically isolate the hybrid battery from the rest of the truck during some operational modes or to support maintenance actions.

c. The LM FTTS-UV system includes a CT specifically designed for the vehicle. The CT is capable of carrying 6,100 pounds of payload. The CT also utilizes independent suspension and air springs to provide leveling and ride height adjustment.

#### **Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- IFV- 120mm- Stryker Mortar Carrier-B

#### **Reference** (Barrett et al., 2006):

Barrett, C. J., Modica, A., Avallone, S., Rose, A., Garfinkel, G., Rouse, J., Smoot, D., White, D., Hendrickson, D., McCall, P., Hoffman, D., Irr, K., Douglas, J., Silva, R., Schiffner, F., & Stafki, L. (2006). System Assessment (SA) for the Stryker Mortar Carrier - B Vehicle Post Milestone III Testing (Get-Well Plan): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report # 61989154. DTIC ADB319208.

#### **Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

190300 - Combat Vehicles

190600 - Guns

Descriptors:

(U) \*ARMORED PERSONNEL CARRIERS, \*MORTARS, TEST AND EVALUATION, PRODUCTION, ARMY TRAINING, ACCURACY, FIRE CONTROL SYSTEMS, GROUND CREWS, LOW RATE, TIMELINESS, OPERATIONAL EFFECTIVENESS, ARMY EQUIPMENT, SYSTEMS ANALYSIS

Identifiers:

(U) M-1129A1 VEHICLES

#### **System Description:**

The Stryker MC-B, M1129AI:

- Is designed to provide rapid and lethal indirect fires to support assaulting infantry of the Stryker Brigade Combat Team (SBCT).
- Is a configuration of the Stryker Infantry Carrier Vehicle variant.
- Integrates a Mission Equipment Package (MEP) that includes a 120mm Recoil Mortar System (RMS), the M95 Mortar Fire Control System (MFCS), and a variety of dismounted mortar systems.
- Will fire the full family of U.S. standard conventional mortar ammunition: M933, M934, M934AI, High Explosive (HE), M930 visible illumination, M983 Infrared (IR) illumination, M929 Smoke, and M931 Full Range Practice Cartridge (FRPC).
- Hosts and integrates the Driver's Vision Enhancer (DVE), Enhanced Position Location Reporting System, Force XXI Battle Command Brigade and Below (FBCB2), and Global Positioning System as Government-Furnished Equipment (GFE).
- Will integrate, at the battalion and company level, a mounted 120mm mortar system.
- Will store and transport a dismounted 81mm mortar system at the battalion and company level.
- Is equipped only with the 120 mm mortar system when with Cavalry Troops of the SBCT Reconnaissance, Surveillance, and Target Acquisition Squadron.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- IFV- Stryker FOV

**Reference** (Barrett et al., 2004):

Barrett, C. J., Brown, C. L., Meshesha, D., Jackson, H., & Garfinkel, G. (2004). System Evaluation Report (SER) for the Stryker Family of Vehicles (for Milestone III Decision): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 40378920. DTIC ADC070741. Report Classification: SECRET. Citation Classification: Unclassified.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER  
Fields and Groups:

010305 - Transport Aircraft

130600 - Surface Transportation and Equipment

Descriptors:

(U) \*COMBAT VEHICLES, \*ARMORED VEHICLES, MOBILITY, SURVIVABILITY, OPERATIONAL EFFECTIVENESS, HUMAN FACTORS ENGINEERING, MAINTAINABILITY, RELIABILITY, LETHALITY, SITUATIONAL AWARENESS

**System Description:**

The family of Interim Armored Vehicles (IAV) includes ten separate systems organized under two basic variants: the Infantry Carrier Vehicle (ICV) and the Mobile Gun System (MGS). The ICV is the core vehicle for nine configurations that share the same platform to optimize commonality and reduce logistics support requirements. Non-developmental mission equipment packages are applied to the basic ICV to establish the other configurations. The MGS variant has no related configurations.

Infantry Carrier Vehicle (ICV). The ICV is designed to operate during all conditions of weather and illumination. As the baseline vehicle for the IAV family, it maintains maximum commonality at the system, subsystem, essential Line Replaceable Unit (LRU), and spare and repair part level with other variant/configurations of the family.

Mortar Carrier (MC) Vehicle. The MC is designed to provide immediate and responsive indirect fire support to the maneuver forces in the conduct of its operations. The approved IAV System Acquisition

Strategy requires that the contractor provide vehicles that meet the Key Performance Parameters (KPP) initially, and that meet all non-KPP by the fielding of the fifth brigade. The contractor is therefore providing a dismounted Mortar Carrier solution initially, and will meet all of the requirements of the Mortar Carrier as a part of the Block Improvement Program to be delivered in time for third brigade fielding. The initial Delivery Mortar Carrier is essentially an ICV chassis that has the capability to transport a 120-mm mortar system that is fired dismounted, and that is equipped with the appropriate racks for stowing the mortar ammunition. At battalion level, the initial MC will store and transport a 120-mm mortar system (fired dismounted) and an 81-mm mortar system (fired dismounted). At company level, the initial MC will store and transport a dismounted 120-mm mortar system and a dismounted 60mm mortar system. The Block Improvement MC to be delivered in time for the third brigade will have an integrated (mounted) 120-mm mortar system, and an integral Mortar Fire Control System (MFCS). At battalion level, the MC will be integrated with a mounted 120-mm mortar system and will store and transport a dismounted 81-mm mortar system. At company level, the MC system will be integrated with a 120-mm mortar system and will store and transport a dismounted 60mm mortar system.

Antitank Guided Missile (ATGM) Vehicle. The ATGM vehicle is designed to provide the BCT with its primary tank killing capability. It possesses the means to defeat any armored threat out to extended ranges. The ATGM provides standoff for the force by use of its precision long-range fire control and weapons capable of destroying enemy armor beyond tank gun effective ranges.

Fire Support Vehicle (FSV). The FSV provides automation-enhanced surveillance, target acquisition, target identification, target designation, and communications necessary to support the BCT with accurate fire support from all available means.

Engineer Squad Vehicle (ESV). The ESV transports the engineer squad personnel and equipment and is equipped to perform mobility and counter-mobility missions. It is based on the ICV variant, and will accept mission packages for obstacle neutralization and marking, mine detection, and a control device for remote system operations.

Medical Evacuation Vehicle (MEV). The MEV is designed to have the capability to move forward covered by over-watching fires, recover casualties, and protect the patient and medical team during evacuation operations. The medical team will be able to use on-board medical equipment to perform emergency care with adequate lighting and power while en route to field medical sites.

NBC Reconnaissance Vehicle (NBCRV). The NBCRV incorporates existing and planned NBC sensor suite detection packages to enable it to perform NBC reconnaissance missions as required.

Mobile Gun System! (MGS) The MGS provides integral weapons designed to provide rapid and lethal direct fires to supported assaulting infantry. The primary weapon is designed to defeat bunkers and create openings in reinforced concrete walls through which infantry can pass to accomplish their missions. It is also required to defeat Level II armor up to the T-62 tank.

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- IFV- Stryker MGS

**Reference** (ATEC, 2008):

ATEC. (2008). *System Evaluation Report (SER) for the Stryker Mobile Gun System*: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 8064100026.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

**System Description:**

The family of Interim Armored Vehicles (IAV) includes ten separate systems organized under two basic variants: the Infantry Carrier Vehicle (ICV) and the Mobile Gun System (MGS). The ICV is the core vehicle for nine configurations that share the same platform to optimize commonality and reduce logistics support requirements. Non-developmental mission equipment packages are applied to the basic ICV to establish the other configurations. The MGS variant has no related configurations.

Mobile Gun System! (MGS) The MGS provides integral weapons designed to provide rapid and lethal direct fires to supported assaulting infantry. The primary weapon is designed to defeat bunkers and create openings in reinforced concrete walls through which infantry can pass to accomplish their missions. It is also required to defeat Level II armor up to the T-62 tank.

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- MRAP- MPCV Buffalo

**Reference (ATEC, 2001):**

ATEC. (2001). System Assessment (SA) for the Buffalo, Mine Protected Control Vehicle (MPCV): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report # 20608613. Report Classification: SECRET/NOFORN. Citation Unclassified.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

**System Description:**

The Buffalo MPCV system is a blast protected vehicle that will operate in explosive hazardous environments to conduct route clearance operations. The system will have an articulating arm with an attachment for digging or lifting and a camera to remotely interrogate a suspected explosive hazard and allow the crew to confirm, deny and or classify the explosive hazard. It will provide a blast protected platform to transport Soldiers and to allow Soldiers to dismount in order to neutralize or mark explosive hazards. (From ARL-HRED MANPRINT Assessment, 2007)

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- MRAP- MPCV CASSPIR

**Reference (ATEC, 2002):**

ATEC. (2002). System Assessment (SA) for the CASSPIR, Mine Protected Control Vehicle (MPCV): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 20608614. Report Classification: SECRET/NOFORN. Citation Unclassified.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

**System Description:**

CASSPIR, Mine Protected Control Vehicle (MPCV).

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Rocket- HIMARS

**Reference** (Choung et al., 2003):

Choung, J. K., Tierney, R., Fatula, E., Davis, A., & Shandle, G. (2003). System Evaluation Report (SER) for the High Mobility Artillery Rocket System (HIMARS): U.S. Army Test and Evaluation Command (ATEC), ATTN: CSTE-AEC-CCED, 4501 Ford Ave., Alexandria, VA 22302-1458. DTIC ADC070159.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

Fields and Groups:

190700 - Rockets

Descriptors:

(U) \*MOBILITY, \*ARTILLERY ROCKETS, GUIDED MISSILES, THREATS, THRESHOLD EFFECTS, ESTIMATES, RELIABILITY, ARMY EQUIPMENT, COMMAND AND CONTROL SYSTEMS, AMMUNITION, TRAILERS, TACTICAL ANALYSIS, SYSTEMS ANALYSIS, ORDNANCE, ARMY PLANNING, TRANSPORT AIRCRAFT, GUNFIRE, REPLENISHMENT, MULTILAUNCHING, ROCKET LAUNCHERS

Identifiers:

(U) NOFORN, HIMARS(HIGH MOBILITY ARTILLERY ROCKET SYSTEM), MLRS(MULTIPLE LAUNCH ROCKET SYSTEM), ATACMS(ARMY TACTICAL MISSILE SYSTEM), C-130 AIRCRAFT

**System Description:**

The HIMARS system includes the launcher, resupply vehicles (RSV) and resupply trailers (RST), Multiple Launch Rocket System (MLRS) Family of Munitions (MFOM), and the command and control system. A HIMARS launcher is capable of firing all fielded MFOM, both rockets and Army Tactical Missile System (ATACMS), and is effective with unguided rockets (i.e., Dual Purpose Improved Conventional Munitions) against targets that require up to one volley of fires. The launcher's reliability estimates are assessed above the threshold value planned for Milestone (MS) C, but the cumulative effect of repeated live firing on reliability remains undetermined until post MS C. HIMARS can be rigged/loaded and off-loaded/derigged for C-130 transportability within required time. The launcher can also reload within the required time, minimizing susceptibility to counterfire threat.

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Rocket- HIMARS

**Reference** (ATEC, 2005):

ATEC. (2005). System Evaluation Report (SER) for the High Mobility Artillery Rocket System (HIMARS): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 50457960. DTIC ADC071379.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190700 - Rockets

Descriptors:

(U) \*ARTILLERY ROCKETS, TEST AND EVALUATION, LIFE EXPECTANCY(SERVICE LIFE), SURVIVABILITY, OPERATIONAL EFFECTIVENESS, EXTERNAL STORES, FIRE CONTROL SYSTEMS, INDIRECT FIRE, ROCKET LAUNCHERS

Declassification:

31 Jan 15

Identifiers:

(U) HIMARS(HIGH MOBILITY ARTILLERY ROCKET SYSTEM), ESS(EFFECTIVENESS SUITABILITY AND SUVIVABILITY)

**System Description:**

High Mobility Artillery Rocket System (HIMARS).

**Report Availability:**

Secret/NoFORN- Report Classification: SECRET. Citation Classification: Unclassified. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Trailer- Low Bed Semitrailer M870A3

**Reference** (Mikolinis, 2003):

Mikolinis, T. E. (2003). System Evaluation Report (SER) for the Type Classification (TC)-Standard and Materiel Release/Fielding Decisions of the M870A3 Semitrailer, Low Bed, 40 Ton / Abbreviated (ASER): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report # 32338856.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA)

**System Description:**

The M870A3 lowbed semitrailer is 42 feet 4 inches long, 8 feet 6 inches wide (expandable to 10 feet 6 inches wide), has three axles and a hydraulically detachable gooseneck. Power for the trailer hydraulic system is provided through an interface with the prime mover. The M870A3 has a required payload capacity of 40 tons, has a 3.5-inch kingpin, and can operate over primary, secondary and limited trail terrain profiles in climatic conditions ranging from -25 to 120 degrees F. The M870A3 is being procured to fill shortfalls in the existing Engineer units that use the M870A1 semitrailer as their primary equipment hauling system. The M870A3 is a commercially produced semitrailer with a military modification package (consisting of a 12 / 24-volt electrical system, CARC paint, blackout light capability, and sling lifting shackles). Most of the trailer subsystems are covered by the system or component manufacturers' standard commercial warranties. Procurement of the M870A3 will be through a bulk purchase from the GSA schedule for commercial off-the-shelf/non-developmental items.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Trailer- TMWSS

**Reference** (Matthews et al., 2002):

Matthews, S., Walker, T., Mallamo, J., Smith, F., & Owens, M. (2002). System Assessment (SA) for the Trailer-Mounted Welding Shop Set (TMWSS): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. report # 20518604.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

**System Description:**

The Shop Equipment, Welding, is an enclosure with welding equipment mounted on a M103A3 Trailer, National Stock Number (NSN) 2330-00-141-8052. The enclosure contains tools, welding equipment, consumables, and technical manuals. Owning units will be able to make battlefield weld repairs in all weather, climatic, and light conditions.

The Shop Equipment, Welding, consists of a plastic enclosure with a lift-up roof and welding curtains to provide a shaded area to perform welding on a provided bench area. The enclosure also contains welding supplies accessible by four side doors and a front and rear door.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Utility- HMMWV CBC

**Reference** (Brown et al., 2000):

Brown, P. L., Riddick, R. L., Finkel, M. G., Fujiwara, M. M., & Hannah, L. T. (2000). System Evaluation Report (SER) for the High Mobility Multipurpose Wheeled Vehicle (HMMWV) Cargo Bed Cover (CBC): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 02718307. DTIC ADB257375.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

130600 - Surface Transportation and Equipment

140200 - Test Facilities, Equipment and Methods

150500 - Logistics, Military Facilities and Supplies

Descriptors:

(U) \*PORTABLE SHELTERS, \*PERFORMANCE TESTS, \*MILITARY VEHICLES, \*CARGO HANDLING, \*VEHICLE EQUIPMENT, TEST AND EVALUATION, CARGO VEHICLES, VERIFICATION, SURVIVABILITY, MILITARY EQUIPMENT, OPERATIONAL EFFECTIVENESS

Identifiers:

(U) HMMWV(HIGH MOBILITY MULTIPURPOSE WHEELED VEHICLE), CBC(CARGO BED COVER), SUITABILITY

**System Description:**

The HMMWV CBC is a removable, box-like shelter designed to protect, store, and secure equipment, tools, and pilferable supplies while being transported on the HMMWV. It will also be used for the general transportation of scout [military working] dogs and official mail. It is not used to transport personnel; however, once deployed, it can be used as a work area. The CBC is mountable on and removable from the cargo bed of the HMMWV by the owning unit, using organizational-level maintenance top lift capabilities. The CBC is rigid; made of "rib stiffened" fiberglass reinforced plastic (FRP) with an integral floor; has a lockable rear door, an escape hatch, dual vent ports, access to the driver's compartment of the HMMWV, and the maximum internal volume that the HMMWV cargo bed will allow. It does not require special tools to install, remove, or attach. Periodic maintenance consists of a daily inspection (when in use), before, during, and after preventive maintenance checks and services (PMCS), and inspection after

field training exercises. Repair of minor structural damage will be accomplished at the direct support maintenance level. No maintenance is envisioned for general support or depot levels.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Utility- HMMWV ECV XM1113

**Reference** (Grady and Cieslak, 1998):

Grady, D. M., & Cieslak, A., Jr. (1998). System Evaluation Report (SER) for the High Mobility Multipurpose Wheeled Vehicle (HMMWV) XM1113 Utility Truck, Expanded Capacity Vehicle (ECV): U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 83007016 / SEP 98-08. DTIC ADB238696.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190300 - Combat Vehicles

Descriptors:

(U) \*COMBAT VEHICLES, \*ARMORED PERSONNEL CARRIERS, TEST AND EVALUATION, DIESEL ENGINES, PREVENTIVE MAINTENANCE, FIELD TESTS, OPERATIONAL EFFECTIVENESS, REPAIR, MULTIPURPOSE

Identifiers:

(U) XM-1113 VEHICLES, HMMWV(HIGH MOBILITY MULTIPURPOSE WHEELED VEHICLE)

**System Description:**

The XM1113 ECV is an upgraded version of the M1097 HMMWV Heavy Variant with a gross vehicle weight of 11,500 pounds and major component changes to include a 6.5L turbo charged diesel engine and a four speed transmission.

The ECV consists of two models: the XM1114 up-armored variant and the XM1113 utility variant. Excluding the armor package on the XM1114, both models have the same basic drive train and subsystem components. The XM1113 ECV is an upgraded version of the M1097 HHV shelter carrier. The XM1113 has a gross vehicle weight (GVW) rating of 11,500 pounds versus 10,000 pounds for the M1097 and 10,300 pounds for the M1097A2 HMMWVs. Major component changes of the XM1113 vehicle include a 6.5L turbocharged diesel engine and a four-speed automatic transmission. The visual configuration of the XM1113 is the same as the M1097.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Utility- HMMWV ECV XM1114

**Reference** (Grady et al., 1999):

Grady, D. M., Cieslak, A., & Riddick, R. (1999). System Evaluation Report (SER) for the High Mobility Multipurpose Wheeled Vehicle (HMMWV) XM1114 Up Armored Expanded Capacity Vehicle (ECV): U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 91338033. DTIC ADB243151.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

130600 - Surface Transportation and Equipment

Descriptors:

(U) \*OPERATIONAL READINESS, \*MILITARY VEHICLES, ACCEPTANCE TESTS, REQUIREMENTS, MATERIEL, PRODUCTION, SURVIVABILITY, PERFORMANCE TESTS, PERFORMANCE(ENGINEERING), MAINTAINABILITY, RELIABILITY, ENDURANCE(GENERAL), CLASSIFICATION, USER NEEDS, SYSTEMS ANALYSIS

Identifiers:

(U) HMMWV(HIGH MOBILITY MULTIPURPOSE WHEELED VEHICLE), XM-114 VEHICLES

**System Description:**

The ECV consists of two models: the XM1114 up-armored variant and the XM1113 utility variant. Excluding the armor package on the XM1114, both models have the same basic drive train and subsystem components. This evaluation applies to the XM1114 variant only.

a. The XM1114 ECV is an upgraded version of the M1097 HHV armament carrier. The XM1114 has a gross vehicle weight (GVW) rating of 12,100 pounds versus 10,000 pounds for the M1097, 10,300 pounds for the M1097A2, and 11,500 pounds for the XM1113 HMMWVs. Major component changes of the XM1114 vehicle include a 6.5L turbocharged diesel engine, a fourspeed automatic transmission, and upgraded brake and suspension systems. The XM1114 is a four-door vehicle designed to provide ballistic protection for the crew against 7.62 AP direct fire and mine blast.

b. Because of urgent cost and schedule issues, the ECV Purchase Description was Type Classified (TC) Generic in December 1994. Thus, the total production contract for the ECV was awarded prior to any system testing.

c. An initial emergency release of 41 0 XM1114s was approved in February 1996 to support US Army peacekeeping operations in Bosnia. The XM1113 was not released. Testing continued after the initial release and disclosed problems with the power train, brake, and suspension components, which resulted in numerous hardware modifications to the initial design of the ECV.

d. It should be noted that during the 3 1/2 years of testing, approximately 500 (of a total contract buy of 1,350 vehicles) have been built, released to the field, and are in various configuration stages.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Utility- HMMWV- JSLNBCRS

**Reference** (Webster et al., 2003):

Webster, C., Brown, T., Parks, A., Fuller, J., chipman, M., Chan, C., Thurston, S., Simmons, R., Donaldson, R., McDowell, J., Dawdy, E., Sears, L., Foster, M., Klein, M., & Wisniewski, K. (2003). System Assessment (SA) for the Joint Service Light Nuclear, Biological, Chemical, Reconnaissance System (JSLNBCRS): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report # 31638827.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

From DTIC ADB316690

Fields and Groups:

150603 - Chemical, Biological and Radiological Warfare

190300 - Combat Vehicles

Descriptors:

(U) \*SURVIVABILITY, \*ARMY EQUIPMENT, \*ARMORED VEHICLES, \*RECONNAISSANCE, TEST AND EVALUATION, NUCLEAR WARFARE, JOINT MILITARY ACTIVITIES, MULTIPURPOSE, CHEMICAL

## WARFARE, BIOLOGICAL WARFARE, OPERATIONAL EFFECTIVENESS, MOBILITY, DEFENSE SYSTEMS

### Identifiers:

(U) SYSTEM ASSESSMENTS, LRIP(LOW RATE INITIAL PRODUCTION), JSLNBCRS(JOINT SERVICE LIGHT NUCLEAR BIOLOGICAL AND CHEMICAL RECONNAISSANCE SYSTEM), \*JOINT SERVICE LIGHT NUCLEAR BIOLOGICAL AND CHEMICAL RECONNAISSANCE SYSTEM

### System Description:

**Key Features.** The major system segments are the base vehicle, command and control, and NBC equipment suite. Below each segment are the major functions performed by that segment. Within each function box, the equipment that performs that function is listed.

Three different types of equipment are being used within the JSLNBCRS system. As shown in the legend, they are: Non-developmental items - designated by a box with dotted border. Items being developed within the JSLNBCRS program - designated by a box with solid outline. Items being developed by other programs - designated by a shaded box with solid outline.

### Major System Segments.

**Base Vehicle.** The base vehicle segment consisted of the vehicle, life support subsystem, and power supply subsystem.

**a. Vehicle.** The HMMWV model M1113 was chosen because of its expanded payload capacity. The HMMWV is equipped with a hard cab and an S788 shelter that was extended by 11 inches to provide sufficient space for the Environmental Control Unit (ECU).

**b. Life Support System (LSS).** The life support subsystem consists of two M-93 Gas Particulate Filter Units (GPFUs) and an ECD. The GPFUs provide filtered, pressurized air for collective protection of the shelter and vehicle cab. The ECU provides climatic conditioning of the shelter and cab air for the crew and equipment.

**c. Power Supply.** The power supply function is fulfilled by a variety of sources, including an Auxiliary Power Unit (APU) being developed within the JSLNBCRS program (consisting of a diesel engine/generator), non-developmental auxiliary batteries, shore power, and the vehicle alternator (while the vehicle engine is operating). The power sources are conditioned and controlled by the Power Distribution Module (PDM)/Power Converter Module (PCM), which supplies 28 volts direct current (VDC) power to the on-board equipment and 230 volts alternating current (VAC) to the ECU. The PCM is being developed within the JSLNBCRS program.

**NBC Equipment Suite.** The NBC equipment suite performs the vital functions of detecting, identifying, collecting, and marking NBC and toxic industrial chemical hazards. These functions have been subdivided into the ten areas described below:

**a. Radiation Detection.** Radiation detection will be performed by the ADM-300 on U.S. Air Force systems and the AN/VDR-2 on Army and Marine Corps systems. The ADM-300 and ANNDR-2 can both be used as battery operated hand held devices or they can be mounted in the shelter and monitored/controlled by the JSLNBCRS Central Data Processing Units (CDPUs). They are used to locate and measure low and high intensity radioactivity in the form of gamma rays or beta particles, and the ADM-300 can be equipped with external probes to locate and measure alpha, beta, gamma, x-ray, and neutron radiation. The ADM-300 is currently in service with the US Air Force and the AN/VDR-2 with the Army and Marine Corps.

**b. Biological Agent Detection and Identification.** The Joint Biological Point Detection System (JBPDS), currently under development within another program office, provides point detection of biological aerosols. The system continuously monitors the environmental background for changes consistent with a biological attack; collects, concentrates, and preserves a sample for analysis; and identifies which agents are present. It is designed to detect concentrations as low as 15-25 agent containing particles per liter of air (ACPLA) and identify ten different biological warfare agents. The system can be operated via integral controls and displays or through the JSLNBCRS CDPUs.

**c. Chemical Vapor Detection and Identification.** The point detection and identification function for chemical vapors is performed by the Automatic Chemical Agent Detector Alarm (ACADA / M88). The ACADA is a type classified, fielded system that uses ion mobility spectrometry (IMS) technology to concurrently detect and identify nerve and blister agents under all environmental conditions, while mobile or stationary. The ACADA has a standard communication interface to support integration with the central data processing system within the JSLNBCRS. The ACADA can also be operated as a standalone unit using built-in controls and displays.

**d. Standoff Chemical Agent Detection and Identification.** The Joint Service Lightweight Standoff Chemical Agent Detector (JSLSCAD), currently under development within a separate program, is designed to provide stationary and on-the-move detection of nerve, blister, and blood agent vapors using a passive infrared detector operating in the 8-12 micron band. The scanner provides the azimuth and elevation of the cloud. The sensor can be operated from its integral controls and displays or from the JSLNBCRS CDPU.

**e. Surface Chemical Agent Detection and Identification.** The Chemical Biological Mass Spectrometer (CBMS) Block II, which is currently being developed by the US Army is designed to detect persistent chemical agents (nerve and blister) and Toxic Industrial Chemicals (TICs) on the ground. The chemical agent is picked up by a sampler arm/wheel (described in the next section) and presented to the CBMS Block II sampler port, where it is vaporized. The vaporized sample travels through a sampling probe, where the molecules separate due to differences in molecular weight. Once the molecules are separated, they are ionized within the CBMS Block II and the chemical compound is identified, based upon the relative intensity of the ions. The system can be operated using its integral controls and displays or from the JSLNBCRS CDPU.

**f. Surface Contamination Sampling.** The Surface Contamination Sampler (SCS) consists of two arms and wheels that are alternately extended from the vehicle to obtain ground samples of chemical agents and TICs for analysis by the CBMS Block II. The SCS is being developed within the JSLNBCRS program. It uses the proven silicone wheels from the FOX vehicle. The system will be capable of operating over primary, secondary, or cross-country routes at speeds up to 45 kph, depending upon surface conditions. The system can be operated manually or automatically from the JSLNBCRS central data processing system.

**g. Sample Collection and Retention.** The sample collection and retention system consists of 24 sealed vials that are filled by the operator using a gloveport on the rear floor of the vehicle. Using the vials, a 50 cc sample can be collected and stored in a rack on the rear of the vehicle for post mission laboratory analysis. Egress from the vehicle is not required to use the sample collection and retention system.

**h. Handheld Chemical Agent Detection and Identification.** JSLNBCRS is equipped with the fielded Improved Chemical Agent Monitor (ICAM) for dismounted detection and identification of nerve and blister agents.

**i. Area Marking.** The JSLNBCRS contains 175 markers (conforming to STANG 2002 guidelines) for marking areas contaminated with radiological, biological, or chemical hazards. A total of 20 markers and flags are provided for hard surface emplacement. These markers (flags) are connected to weighted bases that are deployed from a chute in the rear of the vehicle. A total of 155 soft terrain marker flags with pointed staffs are also stored on the platform.

**j. Meteorological Data Collection.** The METSMAN meteorological sensor provides air and ground temperatures, relative humidity, wind speed and direction, and atmospheric pressure. It can be operated from its own controls and displays or from the JSLNBCRS central data processing system. The system is a non-developmental item currently fielded in the United Kingdom.

**Command and Control.** The command and control segment consists of the navigation, internal communications, external communications, interface control, and central data processing functions.

**a. Navigation.** The Position Location and GPS Receiver (PLGR) provides navigation data. The PLGR model being used is the ANIPSN-II, which is a non-developmental item. The PLGR can be operated from its integral controls and displays or from the JSLNBCRS central data processing unit.

**b. Internal Communications.** A Vehicular Intercom (VIC-3) system is used for internal communications. The VIC-3 is a non-developmental item.

**c. External Communications.** External communications are provided by two short range voice communication radios (ANNRC-89D, SINCGARS) and a secure jam resistant digital communication radio (ANNSQ-2C (VI), EPLRS). The radios are non-developmental items.

**d. Interface Control.** The VERSA Module Eurocard chassis consists of plug in modules connected to two display/keyboard units which are used as the Man Machine Interface (MMI). The VME chassis contains the necessary software for communications, status, and system control. Two other peripheral items interface to the VME chassis: an inkjet printer and a compact disk read-write (CD-RW) device. The VME chassis interfaces with communications equipment, NBC sensors, SCS Actuator Control Box, driver's warning lights, and other vehicle sensors as well as the two display/keyboard units which are being developed by the JSLNBCRS program.

**e. Central Data Processing.** The Central Data Process Unit (CDPU) is a centralized VME chassis with two workstations, configured with SOLARIS 7 and Windows NT operating systems, which controls the central data processing functions. The CDPU is networked to vehicle sensors, detectors, and EPLRS

radio for external data communication. The CDPU interfaces directly with the position location and GPS receiver (PLGR) and intercom. The central data processing function contains three major Computer Software Configuration Items (CSCI), the Joint Detections Analysis Communications Suite (JDACS), Command and Control Personal Computer (C2PC), and the Nuclear Biological, and Chemical Analysis (NBC-A). The JDACS CSCI provides the interface between the CDPU and the system sensors and data management functions. The NBC-A CSCI provides the NBC message generation and reporting. The C2PC CSCI provides the command and control functions and performs both message handling and tactical communications. Operator's commands are entered using either the touch screen or keyboard. A printer, located at the surveyor's station, is also available through the parallel port on the surveyor's CDPU.

**f. Display/Keyboard.** The display/keyboard is a portable unit with carrying handle. It is mounted into the commander and surveyor's workstation and is adjustable for personal comfort. The display is located on the top cover with the keyboard in the bottom section. The unit can be opened and closed as needed. The display contains a 14 inch 1024 x 768 pixel touch panel liquid crystal display (LCD) with its associated controls to the right of the display. The keyboard is a sealed Personal System/2 (PS/2) keyboard with three button trackball. The JSLNBCRS system will contain two of these units, one for the commander in the cab and one for the surveyor or operator in the shelter.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Utility- HMMWV- JSLNBCRS-HMMWV

**Reference** (Webster et al., 2006):

Webster, C., Parks, A., Wetzel, R., Meirose, S., Heaps, E. L., & Spear, G. (2006). System Assessment (SA) for the Joint Service Nuclear, Biological, and Chemical Reconnaissance System (JSLNBCRS) High Mobility Multipurpose Wheeled Vehicle (HMMWV) Variant: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report # 61219121. DTIC ADB316690.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, (SER), System Assessment (SA) for the (SA)

Fields and Groups:

150603 - Chemical, Biological and Radiological Warfare

190300 - Combat Vehicles

Descriptors:

(U) \*SURVIVABILITY, \*ARMY EQUIPMENT, \*ARMORED VEHICLES, \*RECONNAISSANCE, TEST AND EVALUATION, NUCLEAR WARFARE, JOINT MILITARY ACTIVITIES, MULTIPURPOSE, CHEMICAL WARFARE, BIOLOGICAL WARFARE, OPERATIONAL EFFECTIVENESS, MOBILITY, DEFENSE SYSTEMS

Identifiers:

(U) SYSTEM ASSESSMENTS, LRIP(LOW RATE INITIAL PRODUCTION), JSLNBCRS(JOINT SERVICE LIGHT NUCLEAR BIOLOGICAL AND CHEMICAL RECONNAISSANCE SYSTEM), \*JOINT SERVICE LIGHT NUCLEAR BIOLOGICAL AND CHEMICAL RECONNAISSANCE SYSTEM

**System Description:**

The JSLNBCRS major system segments are the base vehicle, command and control, and NBC equipment suite. The three different types of equipment being used within the JSLNBCRS system are: 1) Non-developmental items; 2) Items being developed within the JSLNBCRS program; & 3) Items being developed by other programs.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Vehicle- Wheeled- Utility- HMMWV MCCM-VMS

**Reference** (Abeyta and Zwicke, 2000):

Abeyta, R., & Zwicke, R. (2000). System Evaluation Report (SER) for the Modular Crowd Control Munition (MCCM) Vehicle Mount System (VMS): U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. Report #: 00568200 / NA. DTIC ADB251415.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

190300 - Combat Vehicles

Descriptors:

(U) \*AMMUNITION, \*COMBAT VEHICLES, \*MOUNTS, TEST AND EVALUATION, CONTROL, RISK, PRODUCTION, MODULAR CONSTRUCTION, PLANNING, SYSTEMS ANALYSIS, PERSONNEL DETECTORS

Identifiers:

(U) MCCM-VMS(MODULAR CROWD CONTROL MUNITION-VEHICLE MOUNT SYSTEM), M998 VEHICLES, M1025 VEHICLE, M1026 VEHICLES, HMMWV(HIGH MOBILITY MULTIPURPOSE WHEELED VEHICLES)

**System Description:**

The MCCM-VMS is a set of components which allows the M998, M1025, and M1026 High Mobility Multipurpose Wheeled Vehicles (HMMWV) and 2.5 and 5.0-ton cargo trucks to be fitted with a means to mount and fire MCCM munitions. The VMS consists of four blast boxes, Velcro™-type material for box attachment to vehicle surfaces, lengths of Velcro™-type folding/padded conduit for munition initiation system (100-foot length of Modernized Demolition Initiator (MDI) M17 shock tube/blasting cap) routing/attachment to vehicle surfaces, a shock tube junction (shock tube/MDI initiator housing) box, and a control (arming selector/firing) box.

The blast boxes hold the munitions in fixed orientations with respect to the blast box mounting surface and have vented sides/top which are designed to redirect the detonation backblast to make the munition recoilless. The back surface of each blast box is fitted with the "loop" portion of a hook-and-loop (Velcro™-type) attachment system, which allows the blast box to be quickly affixed to any point on a vehicle where the matching "hook" surface has been attached. The VMS also includes lengths of padded conduit (Velcro™ sandwich) which are routed and attached to appropriate vehicle surfaces to provide a protected channel for the munition shock tube. The M17 shock tubing transmits the firing impulse from the M81 initiators in a four-way junction box triggered by an electrical arming/firing selector/control box in the vehicle cab.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Volcano- CLADS

**Reference** (Romanko et al., 1999):

Romanko, T., White, D., Laughman, R., Zwicke, R., & Tierney, R. (1999). System Evaluation Report (SER) for the Canister Launched Area Denial System (Clads): U.S. Army Operational Test and Evaluation Command, ATTN: CSTE-OEC-ECC-I, Park Center IV, Alexandria, VA 22302-1458. OPTEC, Alexandria, VA. Report #: 92728140. DTIC ADB247619.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

190100 - Ammunition and Explosives

050500 - Sociology and Law

Descriptors:

(U) \*AREA DENIAL, \*CANISTER PROJECTILES, \*NONLETHAL WEAPONS, TEST AND EVALUATION, THREAT EVALUATION, SUBMUNITIONS, RIOT CONTROL, RISK ANALYSIS

Identifiers:

(U) CLADS(CANISTER LAUNCHED AREA DENIAL SYSTEM)

**System Description:**

The CLADS design leverages the VOLCANO system to the maximum extent possible. The CLADS canister will pack five non-lethal sub-munitions into the same canister and packaging configuration that is used for VOLCANO. The canister launch will be controlled in the same manner as VOLCANO, using a modified 20 port launcher rack, the existing Dispenser Control Unit (DCU), the existing Hand Control Unit (HCU), the existing power and launcher rack cables, and a special mounting kit designed for the High Mobility Multipurpose Wheeled Vehicle (HMMWV) cargo bed and HMMWV trailer.

**Report Availability:**

Report Classification: Unclassified/FOUO. Distribution Limited to U.S. Government agencies only in order to protect information and technical data that address current technology in areas of significant or potentially significant military application. Other requests for this document must be referred to Commander, U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458:

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**System Short Name:** SER- Volcano- Towed

**Reference** (Faker et al., 2002):

Faker, D., Meirose, S., Walker, T., Landy, K., & Hawley, B. (2002). System Evaluation Report (SER) for the Towed Volcano: U.S. Army Test and Evaluation Command, (CSTE-AEC-ITED), 4501 Ford Avenue, Alexandria, VA 22302-1458. ATEC, Alexandria, VA. Report #: 21168640. DTIC ADB278303.

**Key Words:**

MANPRINT, MA, HFEA, System Evaluation Report, SER

Fields and Groups:

150606 - Land Mine Warfare

Descriptors:

(U) \*WEAPON DELIVERY, \*ANTITANK MINES, \*MINELAYING EQUIPMENT, TEST AND EVALUATION, RELIABILITY, TRACKED VEHICLES, CANISTERS, ARMORED VEHICLES, TOWING

Identifiers:

(U) MINE CANISTERS

**System Description:**

The VOLCANO is a modular mine delivery system for rapid dispensing of M87A1 Anti-tank (AT) mines. The Towed VOLCANO is an adaptation for mounting the VOLCANO System on an M200A1 MTS tracked trailer. The Towed VOLCANO delivery system consists of the existing VOLCANO Dispenser Control Unit (DCU), a Hand Control Unit (HCU), two VOLCANO launcher racks (as compared to four racks for all other Ground VOLCANO configurations), and a mounting frame (referred to as the A-frame) for mounting the two launcher racks and DCU on the M200A1 MTS tracked trailer. Each launcher rack provides mounting for up to 40 expendable mine canisters, each holding a stack of six M87A1 AT mines.

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**Report Availability:**

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#### **14. Summary of Volume III.**

It has been the intent of this report to consolidate and preserve the historical knowledge contained in previous MANPRINT and MANPRINT related investigations and assessments conducted by the U.S. Army up to the date of this bibliography for use as a reference tool by future MANPRINT practitioners and principal investigators.

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