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White House Communications Agency (WHCA) Presidential Voice Communications Rack Mount System Mechanical Drawing Package

by Steven P Callaway

*Computational and Information Sciences Directorate, ARL*

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REPORT DOCUMENTATION PAGE

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14. ABSTRACT  The White House Communications Agency (WHCA) Presidential Voice Communications Rack Mount System served as an update and refurbishment of an existing system. WHCA wanted to update the radios being used in this communications system and looked to the US Army Research Laboratory to accomplish this task. The new system uses 40% less space and is packaged in a single chassis, resulting in vast improvements over the previous system.
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1. Introduction

The White House Communications Agency (WHCA) Presidential Voice Communications Rack Mount System served as an upgrade of older equipment previously used by WHCA. The customer desired to upgrade their comms equipment from Harris 117F radios to 117G radios. These radios offer a smaller package with increased capabilities. With the decreased size of the radios paired with a more efficient use of space in the units, the new Rack Mount System used 40% less rack space. The Rack Mount System was contained in a single chassis, an improvement over the previous system. This allows for easier transportation, installation, and cabling of the system.

2. Mechanical Requirements

The WHCA Presidential Voice Communications Rack Mount System was designed in 2 versions: an 11 rack unit (11U) chassis that included a fiber optic modem and fiber optic output for network communications, and a 9 rack unit (9U) chassis that did not use a fiber optic modem and instead used direct radio frequency (RF) output from the Harris 117F radio. The version used depended on the customer site requirements where the chassis were installed.

Both 11U and 9U were required to accept 120 VAC power input with a switched outlet, in order it accommodate the installation site. A 24 V AC-to-DC power supply was then required to supply 24 V power to the equipment. Four 117F Harris radios were required to be mounted in the system. The radios needed to be secured in a way that they could be removed and replaced by the user without the use of hand tools. Both 11U and 9U chassis also required a 4-port network switch for operation. A cooling fan was used in the rear of each chassis to enhance equipment cooling.

The 11U chassis required additional equipment to support the fiber optic capability. Two fiber modems were required, mounted in a way that they could be removed and replaced by the user without the use of hand tools. Each radio also required a diplexer to be able to communicate with the fiber modem. The rear panel of the 11U chassis contained the interface connections for the system. Four DB-9 and 4 DB-25 ports were required for radio fill and radio data connections, respectively. Four RJ-45 ports for audio and 1 for a network connection were also required. Four fiber optic feedthroughs were also required for the output of the fiber modem.

The 9U chassis had a shorter required equipment list because of the lack of a fiber optic capability. The same DB-9, DB-25, and RJ-45 requirements held for the 9U
chassis, though 4 N-Type RF connections were required in place of the fiber optic connections.

3. Drawing Package

The following drawing package (Table 1) was used for the fabrication and modification of parts for the WHCA Presidential Voice Communications Rack Mount System. The package was also consulted by US Army Research Laboratory (ARL) technicians for system assembly. The individual drawings are provided in the Appendix.

Table 1 WHCA Presidential Voice Communications Rack Mount System drawing index

<table>
<thead>
<tr>
<th>SK549530</th>
<th>Title</th>
<th>Dash No.</th>
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<tbody>
<tr>
<td>11U Chassis - Side Panel, Right</td>
<td>–12001</td>
<td></td>
</tr>
<tr>
<td>11U Chassis - Side Panel, Left</td>
<td>–12002</td>
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<tr>
<td>11U Chassis - Radio Tray</td>
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<tr>
<td>11U Chassis - Front Panel</td>
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<tr>
<td>11U Chassis - Rear Panel</td>
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<tr>
<td>11U Chassis - Fiber Modem Tray</td>
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<tr>
<td>11U Chassis - Fiber Modem Latch</td>
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</tr>
<tr>
<td>11U Chassis - Fiber Modem Mounting Pin</td>
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<td>9U Chassis - Side Panel, Right</td>
<td>–11001</td>
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<td>9U Chassis - Side Panel, Left</td>
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</tr>
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<td>9U Chassis - Radio Tray</td>
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<td>11U/9U Chassis - Bottom Panel</td>
<td>–13001</td>
<td></td>
</tr>
<tr>
<td>11U/9U Chassis - Radio Tray Rear Support</td>
<td>–13003</td>
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<td>11U/9U Chassis - Radio Guide, Right</td>
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<td>–13012</td>
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</tr>
<tr>
<td>11U/9U Chassis - Radio Latch 3</td>
<td>–13014</td>
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</table>
4. Conclusion

In order to upgrade the WHCA Presidential Voice Communications Rack Mount System, the next-generation Harris radio was installed, the 117G. With the new system, a 40% size reduction was realized, and installation was simplified. A single chassis was used for each system, allowing the majority of cabling to be completed before installation. To date, the systems continue to be deployed in order to keep the entire system current.
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Appendix. WHCA Presidential Voice Communications Rack Mount System Drawings
1. Make modification to stainless steel piano hinge, Monica
   case part number 17722A
2. Remove all burrs and break sharp edges

BU Chassis - Rear Hinge

S. Callaway
5/26/01

US Army Research Laboratory
2900 Parmer Bell Road
Adams, WA 98603

5040-7

S. Callaway
5/26/01

SOS#9550.11006

5040

D. Callaway
5/26/01

SOS#9550.111006

5040-7

D. Callaway
5/26/01
1. Make modifications to fasteners on side panel.
2. Remove all burrs and sharp edges.
NOTES
1. MATERIAL: LGD DELUXE PLASTIC SHEET STOCK, 1/8" THICKNESS
2. REMOVE ALL BURRS AND BROKEN SHARP EDGES

DIMENSIONS DO NOT INCLUDE CLEARANCE FOR MOUNTING HOLES. CLEARANCE NEEDED FOR MOUNTING HOLES.

1.25

S. CALLAWAY
11/9/2003

11U/9U Chassis - Radio Guide, Center

S. CALLAWAY
11/9/2003

SPECS 1300

SPECS 49530.13010
NOTES:
1) MATERIAL: ALUMINUM 2024 ALLOY SHEET STOCK, .125 THICKNESS
2) REMOVE ALL BURRS AND BEND SHARP EDGES
3) ALL DIMENSIONS TO PRECISION: .125 UNLESS OTHERWISE NOTED
4) CHEMICAL CONVERSION COATING PER MIL-C-5541 TYPE II
5) EXTERIOR POWDER COAT ALL SURFACES PER BEST COMMERCIAL PRACTICES
BLACK TEAL-0737. COATER FS-3778

DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED
TOLERANCES
SEE A & B UNLESS OTHERWISE NOTED

US ARMY RESEARCH LABORATORY
2800 FORDLAND MILL ROAD
AUGUSTA, GA 30903

11U/9U Chassis - Radio Latch 3

DATE: 11/20/14

C SRS49530.13014
PAGE 1 OF 1

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1. MATERIAL: USE ALUMINUM ALLOY 6061 T62 SHEET STOCK, OR THICKNESS
2. REMOVE ALL BURRS AND BURP SHARP EDGES
3. BEND RADIUS TO MEASURE OR UNLESS OTHERWISE NOTED
4. CHEMICAL COMPOSITION CONFORMS PER MIL-C-4N41

DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED
TOLERANCE:
+ .010 - .003
+.001 -.000 UNLESS OTHERWISE NOTED

DRAWN: S. COLUMBIA
3/26/2011

REVIEWED: US DÉP'T RESEARCH LABORATORY
2820 M fondle RESEARCH ROAD
ANDREWS, NC 28105

11U/9U Chassis - Radio Tray Rear Support

REV

C

SRS-49510-13003

SCALE

3/4
NOTES:
1. MATERIAL: 6061 ALUMINUM ALLOY, SOLID BAR STOCK, .20 THICKNESS
2. REMOVE ALL BURRS AND BEVEL SHARP EDGES
3. CHIMNEY CONSTRUCTION COATING PER MIL-C-3841
1. MATERIAL: USE ALUMINUM ALLOY 6061, ROG STOCK, 25 DIA.
2. REMOVE ALL BURRS AND BURSHFED EDGES
3. CHROMATE CONVERSION COATING PER MIL-C-5141
INTENTIONALLY LEFT BLANK.