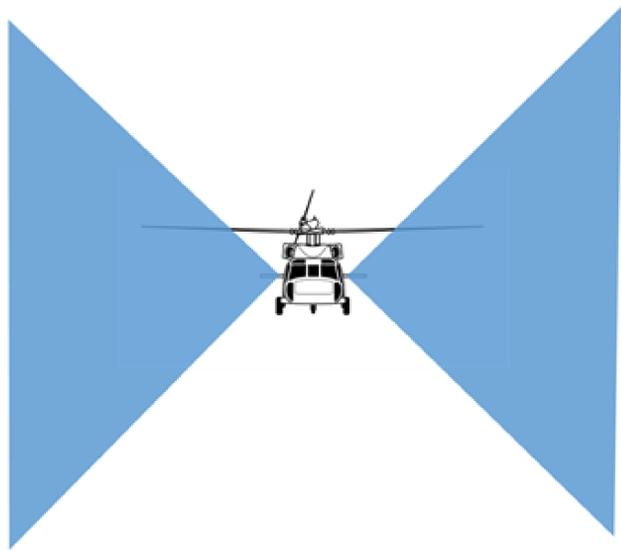


S&T Campaign: Information Sciences *Sensing and Effecting*

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Research Objective

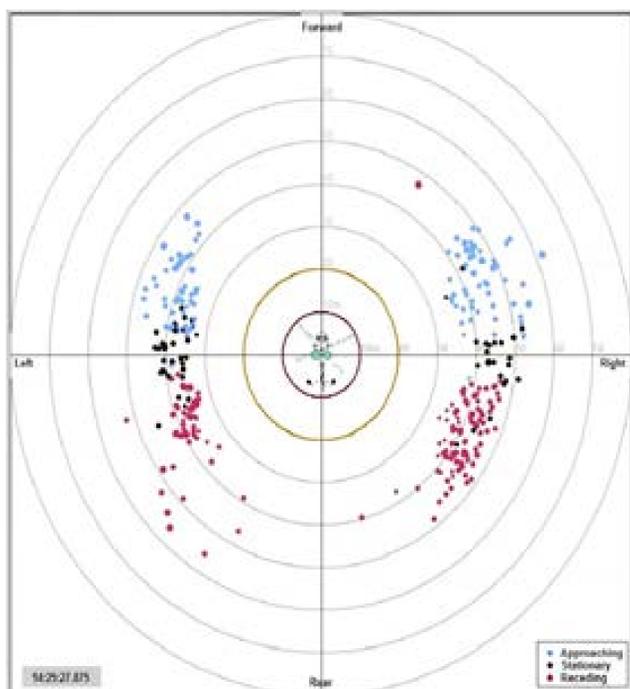
- Design and demonstrate small, inexpensive, but capable radars to perform a collision avoidance function for helicopters in degraded visual environments (DVEs).
- This work supports a large, comprehensive Army effort in DVE-Mitigation.



A short range collision avoidance radar will should operate around the entire helicopter during low-altitude maneuvers.

Challenges

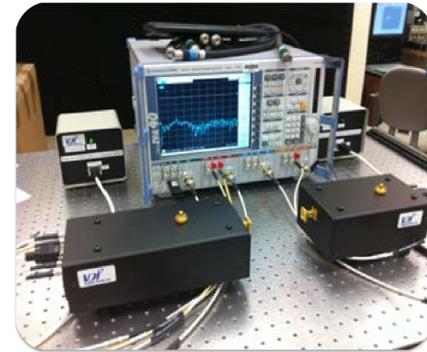
- 2-D millimeter-wave, electronic beam scanning with minimal complexity and cost.
- Efficient algorithms that interpret returned signal and identify collision hazards
- Clutter suppression algorithms



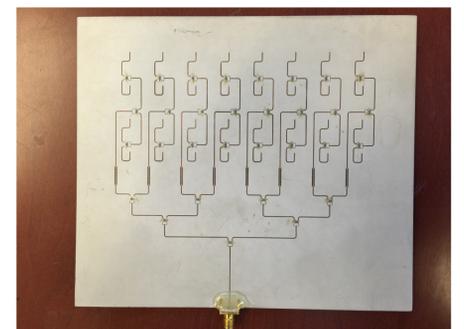
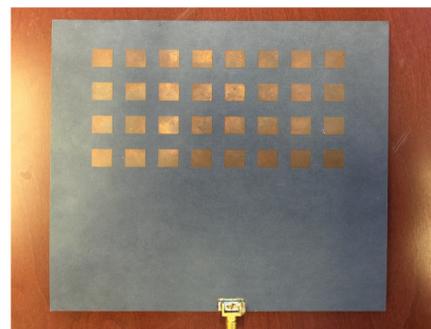
Radar clutter map of terrain during flight.

ARL Facilities and Capabilities Available to Support Collaborative Research

- Millimeter-wave & microwave test equipment
- Millimeter-wave instrumentation radars
- RF circuit fabrication equipment (milling machine)
- Anechoic chambers
- Design and simulation software (AUTOCAD, HFSS, FEKO)
- Experimental systems, technology demonstration



Network Analyzer capability up to 260 GHz



Patch array antenna design and fabrication

Complementary Expertise/ Facilities/ Capabilities Sought in Collaboration

- Micro-strip circuit design and layout for mmW surface mount components
- Micro-processor control boards layout
- FPGA programming of micro-processor control boards
- Novel antenna architectures for 2-D electronic beam steering