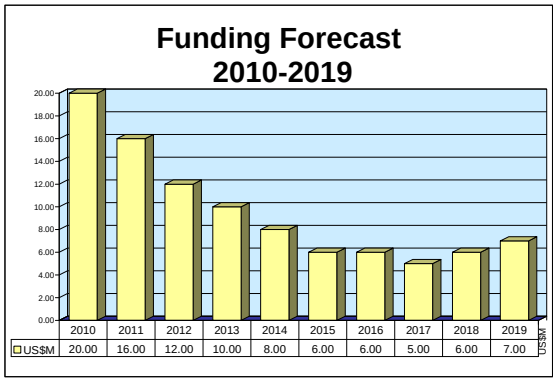
RF Warning & CM Tech (U.S. Air Force)

Outlook

- Through 2010, $20.1 million scheduled to be spent on research and development through USAF Project 63431G, RF Warning and Countermeasures Technology
- Over the next 10 years, the USAF is likely to spend close to $100 million on the program
- Increasingly complex enemy air defense technology drives demand for new research into counter technology



Orientation

Description. The U.S. Air Force RF Warning and Countermeasures Technology project is part of the Electronic Combat Technology program. The project funds the development and demonstration of radio frequency warning equipment.

Sponsor

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Status. Technology-based development.

Application. The program will provide a broad technology base that will support electronic warfare equipment development.

Technical Data

PE#0603270F, Electronic Combat (EC) Technology, funds the development and demonstration of technologies that support Air Force electronic combat (EC) requirements. The program focuses on developing components, subsystems, and technologies that can be applied to air combat, special operations, and airlift applications in three project areas.

The 431G RF Warning and Countermeasures Technology project develops and demonstrates new technologies for missile/threat warning, RF receivers, electronic combat processors, and software used in radio frequency electronic combat suites. This project also focuses on the development and demonstration of subsystems and components that will generate onboard/ offboard RF countermeasure techniques.

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Program Review

The Radio Frequency (RF) Warning and Countermeasures Technology program funds development of wide-band, multi-mode, and multi-function apertures for electronic warfare applications. The U.S. Air Force wants the apertures to be able to handle missions such as threat detection, threat avoidance, suppression of enemy air defenses, surveillance, and reconnaissance.

Another major effort within the program is to develop technology to support aircraft self-protection and support jamming. The effort includes development of radar jamming techniques to deceive and neutralize enemy early warning and surveillance networks. It will also develop new electronic attack techniques by fusing advanced digital signal processing receivers with digital techniques generators.

In FY05, Congress called for the development and demonstration of a special capability high-band antenna array aperture with wide-bandwidth solid-state power amplifiers. Engineers then developed and demonstrated a wide-bandwidth jammer, and implemented needed hardware modifications and upgrades to provide high-band exciter coverage. In other efforts, engineers made the software modifications necessary for the demonstration of the high-band EA jamming subsystem. Finally, an electronic combat battle management study for distributed and networked EA was conducted.

Another congressional add supported the need for a Receiver and Processing Concepts Evaluation program, adding $500,000 in FY04 and $1.0 million in FY05. In FY04 and FY05, the funding expanded research in advanced RF receiver and processing algorithms using state-of-the art concepts and modern technologies.

Flurry of Activity in FY06

A flurry of activity took place within the 431G project in FY06. During that time, low-frequency, wide-band RF receiver apertures for unmanned aerial vehicles (UAVs) were designed and countermeasures to fourth-generation surface-to-air (SAM) systems were developed. In addition, developers in a laboratory setting studied countermeasures to integrated air defense systems (IADS), tested networked radio frequency countermeasures against advanced radar, and developed anti-jam techniques for RF sensors.

During FY07, the project completed a demonstration of the electronic support cross-cueing capabilities of a multi-intelligence sensor suite, as well as laboratory and field-testing of networked RF countermeasure techniques and technology to defeat integrated air defense systems. FY07 funds also continued the development of anti-jam techniques and technologies for advanced RF sensor systems.

Integration and testing of RF receiver apertures on UAVs was completed in FY08. The program also developed and evaluated integrated digital receiver/ jammer architectures.

For FY10, the program will continue to investigate and demonstrate electronic attack techniques from multiple nodes and continue research into integration of electronic attack and information operations to defeat an adversary integrated air defense system.

Funding

U.S. FUNDING

	FY09 QTY	FY09 AMT	FY10 QTY	FY10 AMT	FY11 QTY	FY11 AMT	FY12 QTY	FY12 AMT
RDT&E (U.S. Air Force)								
PE#0603270F ECM Technology								
63431G RF Warning & CM Tech	-	9.9	-	20.1	-	-	-	-

	FY13 QTY	FY13 AMT
RDT&E (U.S. Air Force)		
PE#0603270F ECM Technology		
63431G RF Warning & CM Tech	-	-

All $ are in millions.

Source: FY2010 U.S. Budget Documents (amounts for FY11-FY13 not provided in FY10 budget.)

Worldwide Distribution/Inventories

This is a **United States Air Force** program. There has been some cooperation with the **United Kingdom** in the past.

Forecast Rationale

In order to maintain air superiority, the U.S. Air Force develops countermeasures to defeat continually evolving enemy air defenses. The RDT&E Project 63431G, RF Warning and Countermeasures Technology, provides funding to develop new technology and techniques to continue to counter RF sensors.

In the FY10 defense budget, $20.1 million is scheduled to be spent on research and development. Although this budget does not provide funding amounts for the following years, it is expected that the essential program will continue to be fully supported by Congress and the Pentagon. Based on a projection of the FY10 defense budget, over the next 10 years, the U.S. Air Force is expected to spend $96 million on the RF Warning and Countermeasures Technology project.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR RDT&E FUNDING (in millions $)

Designation or Program	High Confidence				Good Confidence				Speculative			
	Thru 2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
MFR Varies												
RF Warning & Countermeasures Tech (U.S. Air Force) <> United States <> Air Force												
	35.59	20.00	16.00	12.00	10.00	8.00	6.00	6.00	5.00	6.00	7.00	96.00
Total	35.59	20.00	16.00	12.00	10.00	8.00	6.00	6.00	5.00	6.00	7.00	96.00