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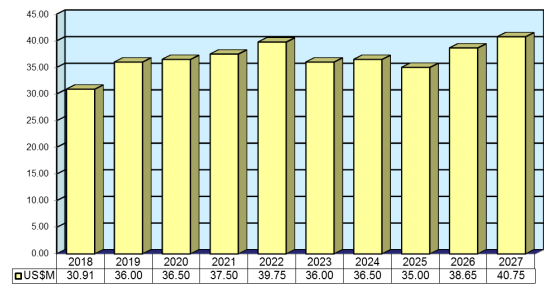
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Connectivity and Protection Technology

Outlook

- Funding will peak in 2027
- Funding is relatively flat during the forecast period
- Forecast International projects that the U.S. Air Force will spend \$367.56 million over the next decade on its Connectivity and Protection Technology project

**Funding Forecast
2018-2027**



Orientation

Description. The U.S. Air Force's Connectivity and Protection Technology project develops networking, communications, and offensive and defensive cyber technologies for the Air Force.

Status. Ongoing research and development.

Application. C4ISR technology development, with an emphasis on communications and computer technology.

Sponsor

United States Air Force
Pentagon
Washington, DC

Contractors

Contractor(s) not selected or not disclosed.

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 22 Commerce Road, Newtown, CT 06470, USA; rich.pettibone@forecast1.com

Technical Data

The U.S. Air Force's Connectivity and Protection Technology project develops technologies for secure, self-configuring, self-healing, seamless networks; advanced communications processors; anti-jam and low-probability-of-intercept techniques; agile, dynamic policy-based network management capabilities; and modular, programmable, low-cost software radios. The project also develops the technology base for the next

generation of ultra-wide-bandwidth, multi-channelled air- and space-based communications networks on and between platforms. Finally, the project develops the technologies required to successfully deter any U.S. adversary from attacking Air Force computer systems "anytime, anywhere" by ensuring the Air Force's ability to:

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1. Access, maintain presence on, and deliver effects to adversary systems
2. Detect, defend against, and respond to attacks on friendly computer systems, as well as provide forensic analysis concerning attempted attacks
3. Provide cyber situational awareness to Air Force commanders.

The Connectivity and Protection Technology project is part of Program Element #0602788F (Dominant

Information Sciences and Methods). The project consists of the following subproject:

Advanced Connectivity Technologies. This subproject develops improved, higher-bandwidth communications, networking, and signal processing technologies to provide secure, adaptive, covert, anti-jam and global battlespace connectivity to highly mobile aerospace forces, all while reducing the equipment footprint.

Program Review

Below is a summary of the recent activity for the Advanced Connectivity Technologies subproject.

Advanced Connectivity Technologies. From FY11 through FY14, the subproject worked on developing next-generation advanced networking technologies for distributed military operations in an airborne environment, ensuring reliable information exchange across all air, space, and cyberspace domains.

From FY14 through FY15, this subproject continued to develop means of secure video distribution over tactical internets "on demand" and to design distributed, cross-layer protocols for cognitive radio ad hoc networks with decentralized control. In FY16, this subproject sought to develop an automated process to port communication models to real-time hardware in the loop.

In FY17, the subproject is initiating the development of dynamic map-to-mission software for operations

continuity and agile information management to ensure secure message exchange – an effort that will continue into FY18.

In FY18, the Advanced Connectivity Technologies subproject is advancing the development of "aerial layer network components" toward the goal of robust, adaptive "Mission Aware" airborne networks. The subproject is also conducting research into high-frequency pathways (e.g., V and W bands of the electromagnetic spectrum) to support aerial and space-based beyond line-of-sight (BLOS) communications.

In FY19, the Advanced Connectivity Technologies subproject will expand the research and development of dynamic map-to-mission software toward the goals of secure message exchange operations continuity and agile information management. Also it will develop a waveform testbed and flight-test a new multi-waveform radio.



The U.S. Air Force's Connectivity and Protection Technology project develops the technologies required to successfully deter any U.S. adversary from attacking Air Force computer systems.

Source: U.S. Department of Homeland Security

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Funding

U.S. FUNDING								
			FY17 <u>QTY</u>	FY17 <u>AMT</u>	FY18 <u>QTY</u>	FY18 <u>AMT</u>	FY19 <u>QTY</u>	FY19 <u>AMT</u>
RDT&E (U.S. Air Force)								
PE#0602788F								
Project 625315								
			-	77.64	-	31.29	-	30.91
			FY20 <u>QTY</u>	FY20 <u>AMT</u>	FY21 <u>QTY</u>	FY21 <u>AMT</u>	FY22 <u>QTY</u>	FY22 <u>AMT</u>
RDT&E (U.S. Air Force)								
PE#0602788F								
Project 625315								
			-	32.34	-	30.25	-	30.65
							-	33.60

All \$ are in millions.

Source: U.S. Air Force FY19 RDT&E Budget Document

Contracts/Orders & Options

Because of the delicate nature of the work conducted under the Connectivity and Protection Technology project, specific contracts related to the project have not been disclosed.

Timetable

<u>Year</u>	<u>Major Development</u>
FY10	Survivability Technologies subproject develops ways to access ("hack") an adversary's information systems
FY11	Cyber Defense Technologies subproject develops technologies to avoid cyber attacks
FY12	Cyber Offense Technologies subproject develops ways to access adversary information systems
FY13	Advanced Connectivity Technologies subproject develops next-generation advanced networking technologies for distributed military operations in an airborne environment
FY14	Cyber Defense Technologies subproject develops technologies to support the ability of cyber missions to keep pace with rapidly changing next-generation communications networks/devices and deliver a full range of cyber effects
FY15	Cyber Technologies for Spectrum Warfare subproject initiates development of active and passive methods for locating, acquiring, and processing data and signals of interest
FY16	Advanced Connectivity Technologies subproject continues to develop an automated process to port communication models to real-time hardware in the loop
FY17	Advanced Connectivity Technologies subproject initiates development of dynamic map-to-mission software to ensure operations continuity and agile information management for secure message exchange
FY18	Advanced Connectivity Technologies subproject advances the development of aerial layer network components toward the goal of robust, adaptive Mission Aware airborne networks
FY19	Advanced Connectivity Technologies subproject develops a waveform testbed and flight-tests a new multi-waveform radio

Connectivity and Protection Technology

Worldwide Distribution/Inventories

The U.S. Air Force sponsors the Connectivity and Protection Technology project.

Forecast Rationale

The U.S. Air Force's Connectivity and Protection Technology project develops networking, communications, and offensive and defensive cyber technologies.

Forecast International projects that the Air Force will spend more than \$360 million on its Connectivity and Protection Technology project over the next decade and

beyond. This forecast is being driven by the Air Force's requirement for communications and computer technologies that will enable "distributed collaborative" military operations.

Funding for the Connectivity and Protection Technology project will be relatively flat during the forecast period. Funding will peak in 2027.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR RDT&E FUNDING (in millions US\$)												
Designation or Program		High Confidence				Good Confidence			Speculative			
	Thru 2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Total
MFR Varies												
Connectivity and Protection Technology Military <> United States <> Air Force												
	420.09	30.91	36.00	36.50	37.50	39.75	36.00	36.50	35.00	38.65	40.75	367.56
Total	420.09	30.91	36.00	36.50	37.50	39.75	36.00	36.50	35.00	38.65	40.75	367.56