



Air Force SATCOM

COMMUNICATORS LEVERAGE FUTURE TECHNOLOGY

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TINKER AIR FORCE BASE, Okla. — Years of research, real-world experience, user input and new advances have brought about many innovations in the way the Air Force connects today's warfighters.

"In today's Air Expeditionary Force environment, satellite communication is critical for us to provide support at home and deployed locations," said Senior Master Sgt. Richard Henderson, supervisor of the 31st Combat Communications Squadron Network Systems Flight.

Some of these innovations include commercial equipment, which is cost effective, solid-state and will extend the life of several satellite terminals. For example, the 3rd Combat Communications Group has new commercial modems plus up and down converters available for the AN/TSC-100A. The 3rd Herd has implemented some of these changes and has reported increases in both efficiency and circuit robustness.

"These upgrades are coming at a time of change for the military, and we're able to be flexible and change along with it," said Master Sgt. John Houghton, NCOIC of 31st CCS Weather Systems Support cadre. "We have lighter packages and are able to deploy smaller teams. Many of these upgrades allow deployment set up to be completed hours ahead of schedule, which saves the military time and helps complete the mission faster."

A new innovation for wideband SATCOM is the Wideband Gapfiller Satellite program, which replaces the

current Defense Satellite Communications System. This new system transmits a much higher data rate, 2.4 gigabits per second — almost 10 times the rate of the DSCS satellites. This program provides the Department of Defense with a military Ka-band operating at 20-21 GHz download and 30-31 GHz upload.

With technology, it's important for communications warriors to look to the future.

REPLACING MILSTAR

The Advanced Extremely High Frequency system is one of the satellite systems projected for the future. This system will replace Milstar and will provide 12 times the throughput of that system. Single user's data rates increase dramatically, more than four times that of Milstar. So for every one link of the old Milstar, the Air Force now has 12 operating at four times the speed. This upgrade is like a one-lane road being transformed into a 12-lane information Autobahn.

Like Milstar, AEHF uses spot beams, which focus power to improve the overall connection to small and large terminal users all while minimizing interception and interference opportunities of adversaries. This system will ultimately support twice as many tactical users and enhance compatibility with international allies.

Another part of the protected satellite system is the Advanced Polar System.

In 1995 the Joint Requirements Oversight Council recognized the need for polar coverage. At that time, payloads were added to host satellites,

which provided minimal coverage. The Advanced Polar System has been proposed for the 2008-2010 timeframe to replace the host packages already in use. This will provide much needed coverage for ships and aircraft operating in these regions.

NARROWBAND

Another part of the satellite family is narrowband communications.

Narrowband comm systems provide data rates of 64 kbps or less and are usually used for broadcast reception and mobile users. These functions are currently supported by the Ultrahigh-frequency Follow On constellation. The current UFO constellation is made up of nine satellites, one of which is an on-orbit spare. The Advanced Narrowband System will replace this system because it falls short of its anticipated need. The Advanced Narrowband System has several components: DoD space; commercial space; telemetry, tracking; and command; network control; user entry; and gateway.

SMART SATELLITE

Satellite manufacturers are also exploring the possibilities of on-board processors. This will allow satellites the ability to route, transmit and manage bandwidth while also completing all the functions of a ground terminal.

By placing processors on-board, this gives the satellite dynamic bandwidth allocation, which enables a more efficient use of the limited resource, allowing better application performance for multi-media traffic and higher traffic volume.

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