

Electromagnetic technicians Byron Moore (from left), Tim Cooper and Lance Benjamin use a spectrum analyzer and signal source generator to certify shielding effectiveness at a shielded anechoic chamber in Huntington Beach, Calif. A shielded room blocks outside radio frequency (RF) interference from getting in and classified signals from getting out. Frequency Management Services handles duties such as these as part of its enterprisewide responsibility over RF spectrum use at Boeing.

JOE OLMOS/BOEING



# On the right wavelength

Access to radio frequency matters to Boeing, to the estimated value of \$20 billion. Here's why it's critical—and here's who's securing this access

By Marcy Woodhull

**H**ow much is a Boeing program worth? Millions, hundreds of millions or even several billion dollars. What about one with an estimated market value of more than \$20 billion? That's the value of Boeing's access to radio frequency (RF) spectrum.

Boeing uses RF spectrum to wirelessly transmit and receive data in applications such as operating cranes and other factory tools and systems; communicating on the factory floor; connecting fire and security personnel; and testing and operating its products. Simply put, without RF spectrum, Boeing's products could not operate.

However, spectrum is a limited resource that's highly sought. To ensure that entities seeking spectrum can get access to it, it's

tightly regulated by the U.S. and international governments. That's why Frequency Management Services, the 34-person Shared Services Group team that has enterprisewide responsibility and expertise over use of RF spectrum, plays a critical role at Boeing.

"With the continuing proliferation of unmanned aircraft systems (UAS) throughout the world, there's an increased emphasis on command, control and communications when integrating these unmanned aircraft with manned aviation in unsegregated airspace. Frequency Management Services plays a critical role in ensuring Boeing's access to this vital shared resource," said Jed Sturman, director, Policy & Certification in Unmanned Aircraft for the Advanced Systems organization of Integrated Defense Systems.

### THREE MAIN MISSIONS

As stated in Boeing Procedure PRO-3271, FMS has the authority to procure, operate and protect Boeing radio licenses and spectrum in support of present and future Boeing operations and business requirements.

FMS has three main missions, according to FMS Director Audrey Allison:

- Facilitate business partners' access to the radio frequency resources they need to support their operations and the products they manufacture.
- Ensure Boeing's compliance with these licenses and the overarching federal and international regulations and laws that cover the use of radio frequency spectrum.
- Be a strategic business enabler. FMS advocates for changes to regulations, laws and standards in the United States and around the world that support the requirements of emerging Boeing products and services.

"Proactive regulatory support and representing our company with one voice can provide Boeing with a key competitive advantage in the global marketplace," Allison said. "Working together as one company is the most expedient approach."

According to Michael Kato, FMS senior manager, the spectrum marketplace is dynamic. "Our organization is well-versed in working with the appropriate government agencies on behalf of Boeing including the Federal Communications Commission and the National Telecommunication and Information Administration in Washington, D.C.," he said.

Yet FMS can't perform its role effectively without a close working relationship with business partners and functional leaders. In 2005, an executive-level process council was established to serve as Boeing's internal governing body over spectrum policies, strategies and issues and for coordinating Boeing views on spectrum issues. Kato chairs the Spectrum Governance Council, which includes representatives of business units, non-U.S. subsidiaries, functions and related councils.

FMS, which includes employees based in the United Kingdom and Canada, also represents Boeing's spectrum interests before regulators in other countries and international and regional intergovernmental bodies devoted to radio regulation.

For example, Boeing maintains more than 175 spectrum authorizations worldwide for the operation of IDS' Boeing Broadband Satcom Network. Additionally, FMS has obtained frequency clearances in 200 countries for the operation of new wireless devices for the 787 Dreamliner airplane.

"Currently, FMS is teaming with Commercial Airplanes to obtain dedicated spectrum for the future operation of wireless sensors on airplanes," said Mohamed El Amin, FMS's London-based international director. "That would help make airplanes lighter, more fuel-efficient and more reliable." ■

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## One-stop service delivery tool

Frequency Management Services (FMS) obtains about 700 spectrum authorizations a year. There's an increasing trend for requests thanks to the growing complexity of Boeing programs and products.

To improve the authorization process, FMS created the Consolidated Frequency Management System (CFMS), a Web-based system at <http://cfms.web.boeing.com> on the Boeing intranet. This system streamlines the process while storing critical compliance assessment information.

"Obtaining access to radio frequencies often requires long lead times to obtain licenses or authorizations, so we encourage employees to consult us as early in the planning process as possible," said Bob Douglass, FMS Enterprise Spectrum manager.

CFMS enables the tracking of service requests from initial consulting, through requirements validation, to government coordination, to the publishing of a Boeing Authorization Memorandum. This site supports the companywide Lean+ and Internal Services Productivity growth and productivity initiatives.

"CFMS is the culmination of over three years of collaboration with our business partners, with the goal of providing a one-stop service delivery tool for Boeing's RF spectrum needs," said John Herpy, manager of CFMS and FMS Systems and process improvement leader.

*—Marcy Woodhull*

## FMS by the numbers

Here's a quick number-driven look at what Frequency Management Services does to support Boeing.

**48** ■■

Number of different kinds of business partner service requests the Consolidated Frequency Management System (CFMS) supports 24 hours a day

**200** ■■

Number of countries FMS has obtained frequency clearances in for wireless devices onboard the 787 Dreamliner airplane

**20** billion ■■

Value in U.S. dollars of Boeing's access to radio frequency spectrum each year

**175** ■■

Number of spectrum authorizations Boeing maintains worldwide to operate Integrated Defense Systems' Boeing Broadband Satcom Network

**700** ■■

Number of spectrum authorizations FMS performs in a year

**186** ■■

Number of RF enclosures tested and certified each year by the FMS Electromagnetics Group