

NARRATIVE

Pursuant to Part 5 of the Commission's Rules (47 C.F.R. §5), General Dynamics SATCOM Technologies, Inc. ("General Dynamics") respectfully submits this application to modify its existing experimental license to operate a network using sub-meter antennas to provide a mobile satellite communications (satcom) infrastructure for predominately military applications.¹ General Dynamics has been operating this system — called Satcom-on-the-Move™ — since November 24, 2004, pursuant to special temporary authority ("STA") and subsequently granted regular experimental authorization to access Intelsat 707 at 53° W.L.² On July 25, 2005, General Dynamics was granted STA to modify its experimental authorization to allow for domestic testing, demonstration and training operations via six additional satellites from all CONUS locations.³

Modifications Requested

To accommodate increasing requests by U.S. Army, U.S. Marine Corps and U.S. Navy communicators for domestic testing, demonstration and training of the Satcom-on-the-Move™ system, General Dynamics hereby requests a formal modification of its existing experimental authorization to continue to operate via these additional satellite from all CONUS locations, as well as from Alaska and Hawaii, and to add three additional hub stations. Specifically, General Dynamics seeks to operate standard 2.4 meter fixed earth stations in Taunton, MA, Duluth, GA, and Scottsdale, AZ, which will operate within the same technical and operating parameters as the existing Richardson, TX facility. These additional fixed earth stations are necessary to further expedite development, testing, and ultimately, the deployment of these systems to the military personnel most critically in need of such communications capabilities.

Further, General Dynamics seeks modification of its existing authorization to allow for operation of the standard Satcom-on-the-Move™ system using smaller (.45 and .50 meter) mobile earth station antennas in addition to the originally licensed .60 meter mobile antennas. The U.S. Marine Corps is currently operating four .60 meter mobile antennas. However, General Dynamics' military customers continue to push for the development and evaluation of even smaller aperture antennas. In fact, the U.S. Marine Corps has recently initiated a competitive procurement process to evaluate and purchase smaller antennas, which are urgently desired for various mission-critical applications in Iraq and Afghanistan. General Dynamics has responded to this request and is hereby attempting to assist the military in meeting these and other high-priority operational requirements as rapidly as possible.

¹ The technical information required by Section 5 of the rules is provided in the electronic form to which this letter is attached.

² File Nos. 0640-EX-ST-2004, 0123-EX-PL-2005.

³ File No. 0390-EX-ST-2005 (authorizing use of the following six satellites (and Intelsat 707 at 53° W.L.): AMC-9 at 83° W.L. (operated by SES Americom), Horizons 1 at 127° W.L. (operated by PanAmSat), and IA-5 at 97° W.L., IA-6 at 93° W.L., IA-7 at 129° W.L., IA-8 to be located at 89° W.L. (all operated by Intelsat). Consistent with Section 5.61 of the Commission's rules, until the instant application is granted, General Dynamics will continue to operate in accordance with the terms and conditions of its STA unless otherwise notified by the Commission.

As discussed, Satcom-on-the-Move™ operations have thus far been conducted with General Dynamics' .60 meter antennas. However, antenna range testing has confirmed comparable antenna sidelobe performance with Ku-Band antennas having apertures of .50 and .45 meters. In fact, while these antennas have correspondingly lower gain and broader main transmission beamwidths, they have demonstrated no greater deviation from the radiation pattern requirements specified in Part 25, paragraph 209, of the Commission's Rules than the previously authorized .60 meter antennas. Moreover, the EIRP power spectral density values for the smaller antennas will be no higher, at any angle of radiation, than those produced by a combination of the .60 meter antenna and an input power spectral density of -21 dBW/4 KHz. Accordingly, General Dynamics requests authorization to use these smaller antennas under the same power spectral density and other operational limitations imposed in the existing authorization.

All other technical and operating parameters as detailed in the original STA and experimental license will remain the same, except for a slight modification to the frequency range in order to simplify coordination issues. Specifically, this system will operate within the international Ku-band frequency ranges of 14.0-14.5 GHz uplink and 11.45-11.7 downlink and domestic Ku-band frequency ranges of 14.0 to 14.5 GHz uplink and 11.7-12.2 GHz downlink. Thus, as part of the instant application, General Dynamics also requests authorization to operate within the full FSS Ku-Band uplink spectrum used by the authorized satellites.

Satcom-on-the-Move™ Background

As more fully explained in the aforementioned STA and previous related applications, Satcom-on-the-Move™ consists of a fixed earth station serving as one endpoint of the link, and various mobile earth station antennas mounted on combat vehicles (Humvees, tanks, etc.). The fixed earth station utilizes a standard 2.4 meter earth station antenna, which is fully compliant with the Commission's regulations and includes standard downlink and uplink equipment with a small, power-controlled transmitter. The original (0.6 meter) mobile terminals consist of a custom-designed high-performance antenna and tracking system that makes use of both active RF tracking as well as predictive-tracking technologies utilizing sophisticated Inertial Navigation Systems and GPS receivers. The smaller (.45 and .50 meter) mobile antennas are substantially similar in design and performance.

The Satcom-on-the-Move™ system uses a directional antenna. As supported by the included antenna pattern and technical information, the width of the beam at the half-power point is 2.3° for the 0.6 m antenna, 2.5° for the 0.5 m antenna, 2.6° for the 0.45 m antenna, and 0.49° for the 2.4 m hub. The orientation on both the horizontal and the vertical plane is adjustable. Because of the use of sub-meter antennas that serve as the essential component of the system, the power levels that result from operation of the system may be higher than those that result from the use of larger, more traditional-sized antennas.⁴ Although the power levels comply with the ITU levels that will govern when the system is used in the field around the world, they may exceed those currently imposed by the Commission for operations in the United States. Accordingly, were General Dynamics to apply to the International Bureau for permanent authority for this system, it would require a waiver of the Commission's Rules to

⁴ Representative link budget analyses, attached to the electronic form, provide more information regarding the power levels with which the system will operate.

operate at these higher power levels. Thus, to the extent necessary for the instant application, General Dynamics hereby requests a waiver of the Commission's rules to operate the system with the technical characteristics set forth in this application.

General Dynamics has obtained confirmation from SES Americom, PanAmSat and Intelsat that the higher power levels will not cause unacceptable interference to its operations.⁵ Radiation hazard analyses indicate that, although the VSAT-type hub antennas are compliant with the Commission's RF exposure standards, the remote terminal antennas may exceed those standards.⁶ However, the remote terminal antennas have a very small signal beam area and are, of course, planned for use on military vehicles with trained operators. These antennas will be mounted on the roof of the vehicles and pointed at geostationary satellites, not at the horizon where personnel could enter the beam. Additionally, the transmitters will be equipped with transmit cut-out protection such that the systems will only transmit when an appropriate satellite receive signal is present. Finally, General Dynamics is willing to undertake any other mitigation efforts the Commission deems necessary to safely operate this equipment during the testing, demonstration, and training phase of the system.⁷

For the reasons discussed above, the Commission should expeditiously grant this application for an experimental authorization. Grant of General Dynamic's application is necessary and will serve the public interest by contributing to the achievement of essential tactical communications that are critical to successful military engagements worldwide.

⁵ Letters from SES Americom, PanAmSat and Intelsat were provided with the STA application (File No. 0390-EX-ST-2005) and are attached hereto.

⁶ The radiation hazard analysis for each antenna is attached to the electronic form.

⁷ In this regard, General Dynamics will not operate the Satcom-on-the-Move™ system within 125 km of White Sands, NM.