NARRATIVE

Pursuant to Section 5.61 of the Commission's Rules (47 C.F.R. §5.61), General Dynamics SATCOM Technologies, Inc. ("General Dynamics"), respectfully submits this application for Special Temporary Authority ("STA") to modify its authorized Satcom-on-the-Move™ network which uses sub-meter antennas to provide a mobile satellite communications (satcom) infrastructure for predominately military applications.[1] General Dynamics has been operating this system since November 24, 2004, pursuant to an STA and subsequently granted regular experimental authorization to access Intelsat 707 at 53° W.L.[2] General Dynamics requests this STA to accommodate requests by U.S. Army, U.S. Marine Corps, and U.S. Navy communicators to test and demonstrate the Satcom-on-the-Move™ at various military bases across the country before the units are shipped to Iraq and other theaters of operation. This cannot be accomplished with the limited geographic coverage provided by the Intelsat 707 satellite and at the few test sites currently authorized.

Accordingly, General Dynamics requests this STA to allow for additional domestic testing, demonstration and training operations of its system via six additional satellites: (i) AMC-9 at 83° W.L. (operated by SES Americom); (ii) Horizons 1 at 127° W.L. (operated by PanAmSat); and (iii) IA-5 at 97° W.L., IA-6 at 93° W.L., IA-7 at 129° W.L. and IA-8 to be located at 89° W.L. (all operated by Intelsat). General Dynamics also seeks STA to modify its authorization in order to communicate with these satellites and Intelsat 707 from all CONUS locations. Similar authority was recently granted to Titan Corporation, who received an experimental authorization to operate using 18 inch antennas from CONUS locations.[3] General Dynamics requests this STA for a period of six months while it prepares, files and awaits grant of a modification to its current experimental authorization.

As detailed in its previous STA and experimental license filings, the Satcom-on-the-Move™ system will provide the U.S. military with tactical satellite connectivity. This system, called Satcom-on-the-Move™, uses a network consisting of a VSAT hub and sub-meter terminal antennas. The system mounts small (0.6 meter) earth station antennas on combat vehicles (Humvees, tanks, etc.) to support reliable tactical military communications despite the intense gyrations that occur as the vehicles move over rough terrain. The system's unique design ensures that the satellite dish is stabilized at all times so that there is no need to stop the vehicles to lock onto a satellite. This is an important development in tactical military communications. 100

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

[2] File No. 0640-EX-ST-2004 (granted November 24, 2004) and File No. 0123-EX-PL-2005 (granted May 31, 2005). General Dynamics recently sought and was granted special temporary authority to add a remote location to this authorization (File No. 0324-ES-ST-2005).

[3] File No. 0180-EX-PL-2005.

The U.S. military has an urgent requirement for broadband satellite communications connectivity. To support U.S. forces in the Middle East as well as other potential theaters of operation, the U.S. military needs reliable communications systems. The Satcom-on-the-Move™ system is a critical leap forward in meeting this goal. Satcom-on-the-Move™ uses TDMA technology and commercial Ku-band transponders to provide very high potential data rates (312 KB/s or greater) to coverage areas that are large and very well defined. FSS Ku-band already provides broadband communications for fixed and transportable installations, as well as an expanding maritime mobile broadband service. General Dynamics' research and experimentation program is intended to demonstrate new earth station mounting and tracking techniques which will make possible the use of FSS Ku-band satellite transponders for broadband communications with moving military vehicles.

Pursuant to its STA and experimental authorization, General Dynamics has engaged in a series of demonstrations to the U.S. Government that its new system can obtain the high data speeds that U.S. ground forces need immediately. These demonstrations, which were conducted at certain General Dynamics facilities and the Army's Signal Center at Fort Gordon, Georgia, have been highly successful. The U.S. Marine Corps is utilizing two Satcom-on-the-Move™ prototype units, which are undergoing test and integration and will then be deployed in Iraq. General Dynamics has received orders from the U.S. Army and Marine Corps for additional units and will begin deliveries in the next few months. Testing by General Dynamics and its military communications customers have successfully demonstrated broadband on-the-move communications that are unavailable with any other system. General Dynamics has been asked to provide additional demonstrations and tests at additional U.S. military facilities and General Dynamics sites. These tests cannot be performed using only the Intelsat 707 satellite which has very limited CONUS coverage. The ability to communicate with Intelsat 707 and the six additional satellites requested in this application from all CONUS sites is critical to the success of this system. With a CONUS authorization, General Dynamics will be able to respond immediately to requests for demonstrations and testing of the Satcom-on-the-Move™ system at any military base in the continental United States. Such testing will significantly expedite the deployment of these units to military personnel.

None of the technical or operating parameters as detailed in the original request for STA or experimental authorization have changed. The Satcom-on-the-Move™ system uses a directional antenna. The equipment utilized consists of a standard 2.4 meter fixed earth station serving as one endpoint of the link. This station is fully compliant with the Commission's regulations, and includes standard downlink and uplink equipment with a small, power-controlled transmitter. The 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 antenna tracking system can maintain track, even during brief periods of satellite signal blockage, and thus utilize FSS Ku-band transponders just as if they were being accessed by a fixed earth station. The width of the beam at the half-power point is 2.3° for the 0.6 m antenna and 0.49° for the 2.4 m hub. The orientation on both the horizontal and the vertical plane is adjustable. Careful signal total EIRP and EIRP density control are also

included to ensure that adjacent satellite power spectral density limits result in no more interference than otherwise produced by fully compliant earth station transmissions. Additionally, an automatic transmitter disabling function is included to ensure that transmissions cease when the satellite is not within the antenna main beam due to blockage or mispointing.

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 operate at these higher power levels. To the extent necessary, General Dynamics 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 their operations.[5] With respect to AMC-9, located at 83° W.L., SES Americom owns and operates all satellites currently operating within six degrees.[6] Horizons 1, located at 127° W.L., is the Ku-band payload on a hybrid C/Ku-band satellite operated by PanAmSat, pursuant to an authorization from Japan's Ministry of Public Management, Home Affairs, Posts and Telecommunications.[7] PanAmSat has coordinated with all satellites operating within 6° of Horizons 1 which are Galaxy 10R at 123° W.L. and IA-7 at 129° W.L.

Intelsat has coordinated with all satellites operating within 6° of IA-5, IA-6, IA-7 and IA-8, which include only Intelsat, PanAmSat and SES Americom Satellites. Specifically, IA-5 is adjacent to Galaxy 11 at 91° W.L., IA-6 at 93° W.L., Galaxy 3C at 95° W.L., Galaxy 4R at 99° W.L., AMC-4 at 101° W.L. and AMC-1 at 103° W.L. Galaxy IA-6 is adjacent to AMC-3 at 87° W.L., IA-8 at 89° W.L., Galaxy 11 at 91° W.L., Galaxy 3C at 95° W.L., IA-5 at 97° W.L., and Galaxy 4R at 99° W.L. IA-7 is adjacent to Galaxy 10R at 123° W.L. and Galaxy 13/Horizons 1 at 127° W.L. IA-8 is adjacent to AMC-9 at 83° W.L., AMC-16 at 85° W.L., AMC-3 at 87° W.L., Galaxy 11 at 91° W.L., IA-6 at 93° W.L., and Galaxy 3C at 95° W.L.

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[4] A representative link budget analysis, attached to the electronic form, provides more information regarding the power levels with which the system will operate.

[5] See Letters from SES Americom, PanAmSat and Intelsat attached to the electronic form.

[6] SES Americom is currently the only affected operator as the AMC-9 satellite at 83° W.L. is bracketed in the Ku-band by AMC-5 at 79° W.L., AMC-16 at 85° W.L. and AMC-3 at 87° W.L. Intelsat's IA-8 satellite is expected to be operational at 89° W.L. on or after August 1, 2005.

[7] Horizons 1 is on the Commission's Permitted Space Station List (SAT-PDR-20030210-00015; SAT-3PPL-20040112-0004). In re Horizons Satellite LLC, *Order*, 18 FCC Rcd. 24745 (Nov. 24, 2003).

Commission precedent has established that such confirmation from affected operators is sufficient to mitigate concerns about interference with respect to nonconforming earth station applications.[8] The antennas used by General Dynamics can provide suitable link performance while restricting interference to other operators. Neither Intelsat or General Dynamics has received complaints of harmful interference caused by operation of the Satcom-on-the-Move™ system on the Intelsat 707 satellite, and General Dynamics expects similar results on AMC-9, Horizons 1, IA-5, IA-6, IA-7 and IA-8. However, in the event that harmful interference to any lawfully operating communications station should occur, General Dynamics will take all necessary measures to immediately eliminate the interference.

Radiation hazard analyses conducted by General Dynamics indicate that, although the VSAT hub antenna is compliant with the Commission's RF exposure standards, the terminal antennas may exceed those standards.[9] However, the terminal antennas have a very small signal beam area and are, of course, planned for use on military vehicles with trained operators. The 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. In other words, the transmitters will be disabled at all times other than when the antennas are accurately pointed at the target satellite. 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.

For the reasons discussed above, the Commission should expeditiously grant this request for STA. 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.

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[8] *See, e.g., In re* SWE-DISH Satellite Communications, Inc., Application for Authority to Operate a Single Temporary-Fixed Earth Station in the Ku-Band Fixed-Satellite Service, *Order and Authorization,* DA 04-2607 at ¶ 3 (Int'l Bur. 2004) (recognizing that interference concerns can be addressed by providing evidence that potentially affected satellite operators have agreed to the proposed operations).

[9] The radiation hazard analysis for each antenna is attached to the electronic form.