Starling Advanced Communications Ltd.

EXPERIMENTAL APPLICATION
NARRATIVE AND PUBLIC INTEREST STATEMENT

Starling Advanced Communications Ltd. ("Starling") is seeking special temporary authority ("STA") for experimental operation of up to three (3) StarCar Ku-band transmit/receive terminals for testing and demonstration purposes in the land mobile-satellite service ("LMSS") context. The proposed experimental operations will be conducted throughout the continental United States at specified test facilities for a very limited duration (e.g., several hours per test session) scheduled intermittently over the next six (6) months.

Starling notes that the Commission granted Panasonic Avionics the right to test the Aura LE antenna in the LMSS context. See Call Sign WD9XQT (File Nos. 0544-EX-ST-2008, 0200-EX-ST-2009, and 0339-EX-ST-2009). The Aura LE is a dual-panel version of the single-panel StarCar antenna and has transmit receive panels with the same RF characteristics as StarCar. Accordingly, the Commission may grant Starling operating authority under the same terms and conditions as previously granted for LMSS operations of the Aura LE antenna.

Starling acknowledges and accepts the conditions associated with experimental STA Call Sign WD9XQT, and respectfully requests the Commission to issue similar experimental LMSS operating authority at the earliest possible time.

Description of Antenna

The StarCar antenna, based on patented CoMPA™ (Coherent Multi Plate Antenna) technology, represented in Figure 1 (below, left) next to the previously authorized, dual-panel Aura LE antenna. The transmit-receive panels of the two antennas are identical.

Figure 1. StarCar and Aura LE Antennas

The StarCar antenna will transmit with EIRP density not to exceed 17.5 dBW/4kHz and with a maximum EIRP level of 44 dBW (4 dB lower than the Aura LE antenna). The data rates transmitted from the terminal will vary from 128 kbps to 2 Mbps. The off-axis EIRP spectral density of the StarCar antenna is set forth in the following figure.

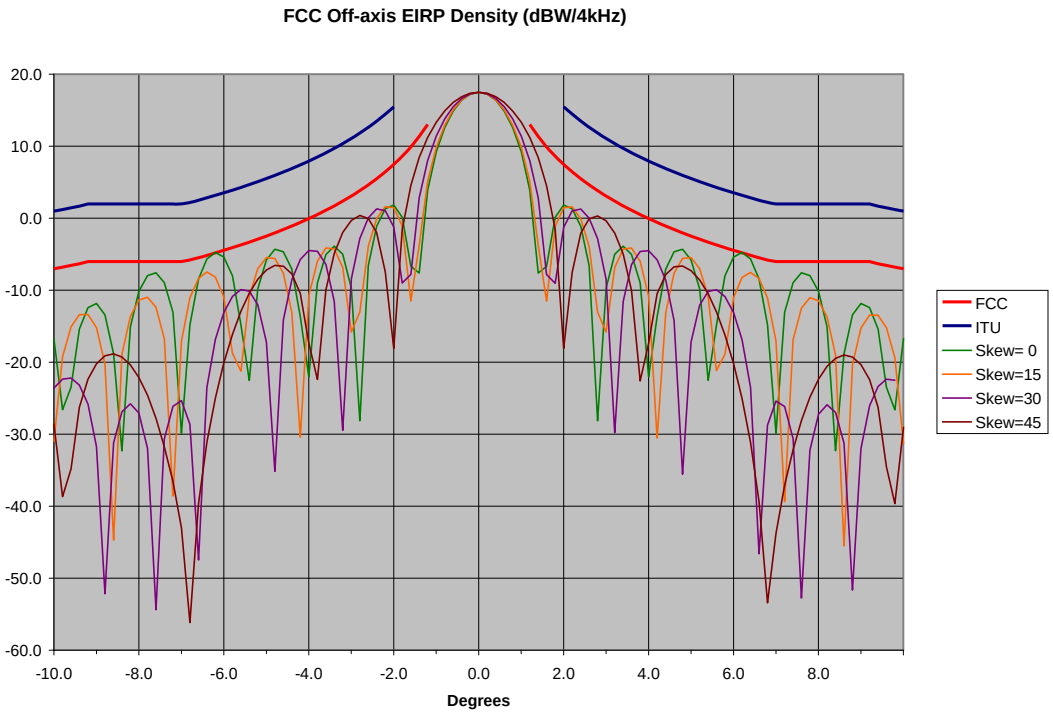

Figure 2. StarCar Off-Axis EIRP Spectral Density

These levels are fully consistent with the limitations set forth in Section 25.226 governing VMES operations. In addition, the StarCar antenna has a pointing accuracy of better than 0.2 degrees, which is also consistent with the Commission's VMES rules.

The foregoing off-axis EIRP density figures include plots for various "skew angles" between 0 and 45 degrees. "Skew angle" is the angular difference between the major axis of the antenna and the geostationary arc when the antenna is pointed at the serving satellite but located at a different longitudinal position than the satellite. Thus, at 0º skew angle, antenna performance is dictated solely by the azimuth gain pattern. As skew angle increases, the elevation gain pattern contributes to overall antenna performance and the combined pattern broadens to reflect this contribution. The skew angle will never exceed 45 degrees during the proposed experimental operations and the effect of skew angle is fully taken into account in controlling off-axis EIRP density produced by the StarCar antenna.

As a result, the StarCar antenna is fully compliant with the FCC's two-degree spacing requirements, and off-axis EIRP spectral density levels associated with routinely licensed VSATs that have been applied to mobile Ku-band terminals in similar contexts (e.g., vehicle-mounted earth stations (VMESs), earth stations onboard vessels (ESVs) and Ku-band AMSS terminals).

Antenna pointing is accomplished via mechanical steering of the antenna and uses a local inertial sensor package placed on the antenna plate itself, together with absolute navigation coordinates, to calculate command vectors. This data is used in conjunction

with the satellite coordinates to yield continuously updated steering commands for the antenna elevation, azimuth, and polarization. The StarCar antenna provides continuous coverage over full 360º in the azimuth plane a with pointing accuracy better than 0.2º RMS. Tracking velocity is 100º/sec (azimuth) and 50º/sec (elevation) with acceleration of 200º/sec^2 (azimuth) and 100º/sec^2 (elevation).

Description of Planned Experimental Operations

Starling seeks temporary authority through the continental United States (CONUS) for evaluation and demonstration of the StarCar antenna. The antenna will be tested in two modes: (i) fully stationary; and (ii) on a ground vehicle rooftop for in-motion testing. Receive-only tests will be conducted to verify antenna performance and set-up to any transmit operation. Two-way tests requiring transmit operation will then be performed to evaluate, optimize and demonstrate return link performance as well as the user experience.

For purposes of this experimental STA application, the StarCar antenna will not operate within line-of-sight vicinity of Radio Astronomy Service (RAS) sites or the Tracking and Data Relay Satellite System (TDRSS) for space research conducted at White Sands, New Mexico and the US Naval Research Lab at Blossom Point, Maryland.[1] Additional coordination with RAS operations to avoid experimental operations during period of RAS observations will further ensure that there is no potential for interference from Starling's planned experimentations.

Starling will operate the terminals with the following satellites:

Horizons-1 at 127°W.L.
Galaxy 17 at 91° W.L.
Galaxy 19 at 97° W.L.
Galaxy 16 at 99° W.L.

Operation of the StarCar antenna are fully consistent with the technical parameters coordinated for these satellites in the context of LMSS operations of the Aura LE antenna. The terminals will communicate with licensed Intelsat hub antennas in Riverside, CA. and Mountainside, MD. At all times, the hub antennas and satellites will operate according to their licensed parameters.

For purposes of these experiments, the StarCar terminals will be operated under Starling's full supervision and control. The points of contact for the planned experimental operations are:

[1] Starling will accept technical limitations imposed on other Ku-band LMSS operations necessary to protect RAS and TDRSS operations.

David Levy
Vice-President of Engineering
Starling Advanced Communications Ltd.
Tel: +972-73-2597323
Fax: +972-4-959 7367
Mobile: +972-52-5521525
Email: dlevy@starling-com.com

Mr. Levy will have the ability and authority to cease all transmissions from the terminals wherever they are located.

For issues involving this Special Temporary Authorization request:

Kenneth G. Ryan, P.E., Skjei Telecom, Inc.
Regulatory Engineering Consultant
Office: (703) 917-4020
Fax: (703) 917-0098
Cell: (703) 919-0361
Email: ken@skjeitelecom.com

Protection of Other Users in the 14.0–14.5 GHz Band

Protection of Fixed-Satellite Service. The FCC has established service rules applicable to VMES operations, which define operational limits in 47 C.F.R. § 25.226. As discussed above, Starling's terminals will operate in such a manner that the off-axis EIRP levels are no greater than the levels established for VMES operations, which are consistent with those produced by routinely licensed VSAT earth stations. To the extent that any adjacent satellite operator experiences unacceptable interference from Starling's experimental operations, Starling will cease terminal transmissions immediately.

Protection of Potential NGSO FSS Systems. Starling acknowledges that non-geostationary orbit ("NGSO") systems are also permitted to operate in the Ku-band. However, no such systems are currently authorized or plan to operate within the period contemplated for the proposed experimental operations.

Protection of Terrestrial Radio Services. Starling has examined current spectrum use in the 14.0-14.5 GHz band and has determined that there are no active FCC-licensed terrestrial services in this band in North America with which its proposed operations would potentially conflict.

Protection of the Radio Astronomy Service. For purposes of protecting radio astronomy sites, consistent with Recommendation ITU-R M.1643, Part C, Starling will limit aggregate power flux density (pfd) in the band of 14.47 GHz to 14.5 GHz as follows:

-221 dBW/m^2/Hz (for protection of Green Bank, Arecibo and Socorro)
-189 dBW/m^2/Hz (for protection all other Radio Astronomy sites)

For purposes of this experimental STA application, Starling terminals will not operate within line-of-sight vicinity of Radio Astronomy sites and during observation periods.

Protection of Space Research Service. Starling recognizes the utilization of the frequency band from 14.0-14.05 GHz and the possible use of the band from 14.05-14.2 GHz allocated to the National Aeronautics and Space Administration ("NASA") Tracking and Data Relay Satellite System ("TDRSS") for space research conducted at White Sands, New Mexico and Blossom Point, Maryland. For purposes of this experimental STA application, Starling will avoid AES operation within line-of-sight vicinity of these earth stations.

Out of Band Emissions. The terminals comply with FCC 47 C.F.R. § 25.202, which provides:

Emission limitations. The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:

1. In any 4 kHz band, the center frequency of which is removed from the assigned frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: 25 dB;
2. In any 4 kHz band, the center frequency of which is removed from the assigned frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: 35 dB;
3. In any 4 kHz band, the center frequency of which is removed from the assigned frequency by more than 250 percent of the authorized bandwidth: An amount equal to 43 dB plus 10 times the logarithm (to the base 10) of the transmitter power in watts.

SUMMARY OF TECHNICAL PARAMETERS - StarCar

Antenna diameter	35 in x 7 in
Type of Antenna	Single panel waveguide fed phased array
Peak Power (SSPA)	20 watts
Transmit Bandwidth	2.56 MHz
Transmit Gain	33 dBi at 14 GHz
EIRP	44 dBW
Transmit Data Rate	128 kbps to 2 Mbps
Transmit Polarization	Horizontal or Vertical
Transmit Max PSD (dBW/4kHz)	17.5
Transmit Azimuth Beamwidth	1.5 degrees
Transmit Elevation Beamwidth	7 degrees
Receive G/T	11 dB, minimum
Receive Bandwidth	500 MHz
Receive Polarization	Dual LHCP and RHCP or Dual Vertical and Horizontal

Antenna Control Parameters

Azimuth	continuous coverage over full 360º
Elevation	0 to 90º antenna elevation
Position accuracy	Static pointing error 0.15º RMS (AZ); 0.2º RMS (AZ) in-motion
Dynamic Tracking capability	AZ velocity 100º/Sec, EL velocity 50º/Sec max AZ acceleration 200º/Sec^2, EL acceleration 100º/Sec^2 max

Starling Terminal Transmit Emission Designators

BPSK kbps	Spread factor	occupied bandwidth (kHz)	Emission Designator
128	1	160	160KG7D
256	1	320	320KG7D
512	1	640	640KG7D
1024	1	1280	1M28G7D
128	2	320	320KG7D
256	2	640	640KG7D
512	2	1280	1M28G7D
1024	2	2560	2M56G7D
128	4	640	640KG7D
256	4	1280	1M28G7D
512	4	2560	2M56G7D

Additional Off-Axis EIRP Spectral Density Plots