



November 2009

Rules Adopted for Vehicle-Mounted Earth Stations

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The FCC recently issued a Report and Order in which it adopted allocation, technical and licensing rules to permit the domestic, U.S. licensing of Vehicle-Mounted Earth Stations (VMES). VMES will be a primary service in the Fixed Satellite Service (FSS) and in the Ku-band frequencies. The FCC defines VMES as an earth station operating from a motorized vehicle that travels primarily on land, receives from and transmits to Ku-band geostationary satellite orbit (GSO) FSS space stations, and operates in the U.S.

The new rules provide opportunities for a variety of uses, including U.S. military training, emergency preparedness and certain commercial purposes where high-bandwidth and advanced mobile communications are beneficial. At this point, because of the cost and size of reception equipment and the required professional installation, the commercial applications of this service remain unclear. Consumer applications are unlikely, but use in trucks may be a possibility since independent truckers could use the service for broadband internet access while on the move.

The technical rules adopted by the FCC ensure that VMES operations will not interfere with existing and future FSS operators and their customers. The rules promote coordination with space research service and radio astronomy service (RAS) facilities, to ensure that these facilities are protected from harmful interference while also protecting terrestrially-based Fixed Service (FS) operators and their customers in the relevant extended Ku-band frequencies.

Currently, mobile earth stations, with the exception of earth stations on vessels (ESV), are not treated as a primary service in the conventional Ku-band. Licensees operating mobile earth terminals (METs) mounted on vehicles and used while in motion within the U.S. currently operate in the land mobile-satellite service (LMSS) on a secondary and non-protected basis. By providing primary status to VMES, VMES licensees can expect the same level of interference protection from adjacent satellite system operations as other primary FSS operators receive.

In adopting the technical and licensing requirements for VMES systems, the FCC relied

heavily on the rules adopted in the ESV proceeding, adopting many of the same requirements and rules for VMES systems as apply to ESV terminals. (In 2005 the FCC had designated ESVs in communication with FSS space stations as a primary application of the FSS.) Due to the similarities between VMES and ESV, the FCC used the ESV rules as a model for VMES as well. The overriding concern in both cases was to protect other FSS satellites from the mobile service's potentially harmful interference.

The FCC determined that VMES can operate compatibly within the two-degree Ku-band satellite spacing environment without causing harm to other FSS operations in the U.S. Likewise, the FCC determined that no harm would be caused to FS operations in the extended Ku-band, as VMES operators, like ESVs, would be required to accept interference from all current and future FS operations in the band. Additionally, VMES would use the 10.95-11.2 GHz and 11.45 -11.7 GHz bands used by FS only for reception; these receive-only operations should not interfere with or restrict other authorized operations in the band.

VMES licensees proposing to operate in the 14.0-14.2 GHz band within 125 kilometers of space research tracking and data relay satellite system (TDRSS) facilities will be required to coordinate through the National Telecommunications and Information Administration (NTIA) before beginning operations. This procedure mirrors that established for ESVs. VMES licensees must also coordinate with the National Science Foundation for operations in the 14.47-14.5 GHz band within certain distances of RAS facilities. Finally, the FCC imposed (a) a 50-kilometer coordination zone around each of St. Croix, Mauna Kea, and the entire island of Puerto Rico for Arecibo; and (b) a 160-kilometer coordination zones around other highly sensitive antenna installations. For the remaining RAS sites, a maximum coordination zone of 50 kilometers was established.

As part of the proceeding, the FCC adopted technical and licensing rules for VMES. Once again, many of these rules are based on the model adopted in the ESV proceeding. In addition to detailed power requirements and other technical specifications, the rules provide:

- B Licensees must collect and retain operational data. The data are to be used to assist in identifying and resolving sources of interference. The information must be retained for one year by VMES licensees and must be made available to coordinators, system operators, NTIA and the FCC within 24 hours of request.
- B A point of contact in the U.S. with authority and ability to cease all emissions from their VMES terminals must be maintained.
- B Blanket licensing of VMES will be issued. The application will require a narrative describing the overall system as well as specific information on

the antennas, power density and emission characteristics of each class of earth station comprising the network.

- B Individual licenses will also be issued, *but* the FCC encourages networks of technically identical antennas to be licensed under blanket authority rather than individually.
- B Ku-band VMES will be able to operate with any U.S. licensed satellite and non-U.S. satellite on the Permitted Space Station List as long as the application meets the off-axis E.I.R.P.-density and antenna pointing requirements.
- B Licenses will be issued for a period of 15 years.
- B Licenses for this service are available on a non-exclusive, non-interfering basis after full coordination with other spectrum users over the range of proposed operations.
- B Routine environmental evaluations for radio frequency (RF) exposure must be submitted. Applicants must submit a RF exposure evaluation demonstrating whether VMES terminals, or classes of VMES terminals, will result in power densities that would exceed the FCC's RF exposure criteria. Those VMES terminals not complying with the RF exposure limits must submit an environmental assessment and a plan for mitigation of radiation exposure.
- B Installation of VMES terminals on vehicles must be by qualified installers who have an understanding of the antenna's radiation environment and the measures best suited to maximize protection of the general public and persons within the vehicle.

Many more detailed technical and licensing rules were adopted and discussed. Review of the rules, the Report and Order, and discussion with an engineer or attorney would help clarify the additional details.