

### **Request for Waivers – Question 35**

Comtech Mobile Datacom Corporation (“CMDC”) requests a waiver of footnotes US308 and US315 to the U.S. Table of Frequency Allocations and Section 25.136(d) of the Commission’s Rules. These provisions require that a mobile earth station operating in the 1530-1544 MHz and 1626.5-1645.5 MHz bands meet certain real-time priority and preemptive access requirements. Compliance with these requirements is intended to protect from interference the maritime mobile-satellite service distress and safety communications that also operate in the lower L-band. The National Telecommunications and Information Administration (“NTIA”) has indicated that if a terminal is capable of, among other things, ceasing transmissions and inhibiting further transmissions within one second, that terminal would be considered to meet the real time access and priority preemption requirements in footnotes US308 and US315.<sup>1</sup>

As discussed below, CMDC’s terminals (all half-duplex) comply with the requirements listed in Section 25.136(d) of the Commission’s Rules. However, CMDC’s terminals do not comply with NTIA’s interpretation of footnotes US308 and US315, as CMDC’s terminals, being half-duplex, are unable to cease transmissions within one second. Nonetheless, CMDC demonstrates below that there is good cause for granting a waiver of footnotes US308 and US315 (as well as Section 25.136(d) and any other rules or footnotes that may apply here, in the Commission’s view).

### **Description of CMDC System**

CMDC provides wireless packet data services from mobile terminals throughout the United States and overseas. CMDC terminals typically are placed on land vehicles or at remote, fixed site locations. Either data collection devices or keyboard/displays, or both, may be attached to the terminals depending on the customers’ needs in that location or at that time.

The terminals transmit and receive data packets via dedicated channels in the L-band, which for the U.S.-based transceivers is provided by MSAT-1 or MSAT-2. The packets can be routed over any of several terrestrial data networks, or to other mobile transceivers in the CMDC network. Use of the satellite relay is as a “bent pipe,” meaning that only bandwidth and power are purchased from the satellite relay operator. Network management is provided by CMDC-owned and operated gateway sites.

The wireless packet data network is bi-directional, and transmission can be asynchronous in both directions. When powered on, terminals are either listening for packets addressed to them - individually or in groups - from a gateway station, or are transmitting packets in short bursts to a gateway station. Other modes of operation are possible, including periodic reporting

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<sup>1</sup> See *Richtec Inc.*, 18 FCC Rcd 3295, 3298 (2003) (“*Richtec*”).

from a terminal to a customer's operation center, via a gateway, and polled queries to the terminals by either the gateway or operation center.

The mobile transceivers transmit and receive direct sequence spread spectrum bursts. In the contiguous U.S. ("CONUS"), the typical burst duration is less than 100 milliseconds, while the maximum burst duration is about 400 milliseconds. In Alaska and Hawaii, a reduced data rate service is employed that results in a maximum burst duration of 1.6 seconds. Bursts from any individual transceiver are usually a minimum of several minutes apart. This means that the maximum interval during which a transceiver will not be listening to the outbound channel is less than 0.4 seconds (1.6 seconds in Alaska and Hawaii), and represents only a small fraction of one percent of its operating time.

In normal operation, a packet of information sent by a mobile terminal will be received by the CMDC gateway station, then routed to the designated recipient via the Internet, dedicated links, or the CMDC network outbound channel. There are no constraints on the routing of packets, though mobile-to-mobile, mobile-to-operation center, and operation center-to-mobile represent the majority of the traffic.

The mobile terminals can be tuned to transmit and receive across the entire L-band. This is to facilitate access to available bandwidth on the satellite relays, since the satellites operate many beams, and any one frequency may not be available across all beams. The outbound beams broadcast their identity in the form of network management packets from which the mobile terminal can determine what transmission frequencies are available for use. The operating frequencies may be changed by command from the gateway stations. Also, a mobile terminals can only transmit when its receiver is locked onto a CMDC forward link.

The network management function of the CMDC network is provided by CMDC's 24/7 Network Operations Center in Germantown, MD. This function includes monitoring traffic, setting and adjusting operating frequencies, and activating a system wide shut-down capability for individual or multiple service regions as required. The shut-down can be accomplished by either CMDC personnel, locally or remotely, as well as by the satellite operator.

### **Compliance with Section 25.136(d)**

The following paragraphs explain CMDC's compliance with Section 25.136(d) of the Commission's Rules.

*Section 25.136(d)(1). All MES transmissions shall have a priority assigned to them that preserves the priority and preemptive access given to maritime distress and safety communications sharing the band.*

*Section 25.136(d)(2). Each MES with a requirement to handle maritime distress and safety data communications shall be capable of either: (i) recognizing message and call priority identification when transmitted from its associated LES or (ii) accepting message and call priority identification embedded in the message*

*or call when transmitted from its associated LES and passing the identification to shipboard data message processing equipment.*

CMDC's terminals contain a priority field built into the CMDC message protocol used between the MES and its associated LES. This priority field could be used to determine how the message should be handled within the CMDC network. Since CDMC terminals are not used for maritime distress services and do not share a channel with transceivers used for that purpose, there is no requirement for the network to process this priority field at this time. By putting the field in the transceiver firmware, however, CMDC has the "hooks" in place to deploy a network priority scheme should the need arise.

*Section 25.136(d)(3). Each MES shall be assigned a unique terminal identification number that will be transmitted upon any attempt to gain access to a system.*

CMDC's terminals comply with this requirement. Each CMDC MES is part of a virtual private network with a distinct identity.

*Section 25.136(d)(4). After an MES has gained access to a system, the mobile terminal shall be under control of a LES and shall obtain all channel assignments from it.*

CMDC's terminals comply with this requirement. After connecting to an associated LES system, the CMDC MESs obtain control and frequency tuning commands over the communication channel only from that LES.

*Section 25.136(d)(5). All MESs that do not continuously monitor a separate signalling channel or signalling within the communications channel shall monitor the signalling channel at the end of each transmission.*

CMDC's terminals comply with this requirement. The CMDC MESs are a half-duplex RF system operating on dedicated channels and when not transmitting are continuously monitoring the LES for command signals.

*Section 25.136(d)(6). Each MES shall automatically inhibit its transmissions if it is not correctly receiving separate signalling channel or signalling within the communications channel from its associated LES.*

CMDC's terminals comply with this requirement. As noted previously, a CMDC MES will not transmit unless it is properly receiving and locked onto the incoming RF signal from its associated LES.

*Section 25.136(d)(7). Each MES shall automatically inhibit its transmissions on any or all channels upon receiving a channel-shut-off command on a signalling or communications channel it is receiving from its associated LES.*

CMDC's terminals comply with this requirement. A CMDC MES will not transmit if it has been disabled by a control signal from the associated LES.

*Section 25.136(d)(8). Each MES with a requirement to handle maritime distress and safety communications shall have the capability within the station to automatically preempt lower precedence traffic.*

As noted previously, there is no requirement for CMDC's MESs to handle maritime distress and safety communications, but the "hooks" are in the transceiver firmware and thus a priority function can be easily added if the need should arise.

### **Compliance with NTIA interpretation regarding real time access and priority preemption**

As noted previously, NTIA has indicated that it will consider a terminal to satisfy the real time access and priority preemption requirements in footnotes US308 and US315 if the terminal is capable of, among other things, ceasing transmissions and inhibiting further transmissions within one second. CMDC interprets this benchmark as meaning that each MES for all of its operating modes must, within one second of receiving a shutdown command, stop all ongoing RF transmissions and prevent any new RF transmissions.

The CMDC MES is an extremely low duty cycle (0.03 percent on average) DSSS system having an RF transmission duration, at the maximum message length (128 bytes) and data rate of 400 milliseconds. The message length of a typical transmission is roughly 50 bytes, having an RF transmission duration at the full data rate of approximately 152 milliseconds.

The data rate at which a MES transmits is set by CMDC's signal set and not by the individual operating the terminal. All MESs that are used in CONUS, which constitute the vast majority of CMDC MESs in the U.S., operate at the full data rate. A small number of CMDC's terminals that operate in Alaska and Hawaii are programmed to operate at 1/4 data rate. Operation at a slower data rate is necessary in Alaska and Hawaii to compensate for the reduced availability of satellite bandwidth for Alaska and Hawaii. At 1/4 data rate, the transmission duration of a typical transmission (50 bytes) increases to 607 milliseconds, and the transmission duration for a full length message increases to 1.6 seconds.

The timeout parameter on CMDC's MESs is set at 2 seconds. This means that when a MES detects a loss of forward link, the MES will continue to monitor the forward link for an additional 2 seconds to confirm that the carrier is down before disabling the transmitter.

Adding the 2 second timeout period to the transmission duration provides the total time required by CMDC's MESs to stop all ongoing transmissions and prevent any new transmissions, as follows. The information provided in the following table applies to each model of MES for which CMDC seeks authority in this Application.

<u>Length of Message</u>	<u>Data Rate</u>	<u>Seconds</u>
128 bytes	Maximum	2.4
50 bytes	Maximum	2.2
128 bytes	¼	3.6
50 bytes	¼	2.6

**Waiver Request**

Section 1.3 of the Commission’s Rules authorizes the Commission to waive its rules for “good cause shown.”<sup>2</sup> In general, the Commission will grant a waiver of its rules if the relief requested would not undermine the policy objective of the rule in question and would otherwise serve the public interest.<sup>3</sup> In considering requests for non-conforming spectrum uses, the Commission has indicated that it will generally grant such waivers when there is little potential for interference into any services authorized under the Table of Allocations and when the non-conforming operator accepts any interference from authorized services.<sup>4</sup>

CMDC submits that all of the Commission’s requirements for grant of a waiver are satisfied here. It is unlikely that the preemptive capability of CMDC’s terminals will adversely affect maritime safety for the following reasons. *First*, as noted previously, CMDC’s terminals operate on dedicated rather than shared channels. The Commission and NTIA have previously recognized that operation of MESs on dedicated channels makes it unlikely that such operation will affect the real time access and priority preemption for maritime distress services.<sup>5</sup>

*Second*, even under the worst-case scenario – a terminal transmitting a full-length message at ¼ rate – the terminal will cease transmitting in only 3.6 seconds, since CMDC’s MESs transmit only short bursts of data. The Commission has previously granted waivers to other systems that require considerably longer than 3.6 seconds to cease transmission, recognizing that these systems are unlikely to adversely impact maritime safety.<sup>6</sup>

*Third*, the worse-case scenario rarely occurs, because CMDC’s terminals operate at ¼ rate only in Alaska and Hawaii, and CMDC’s system is an extremely low duty cycle system. CMDC has analyzed data from its operations in the U.S. over the past 8 months, and has determined that only an average of 2900 packets per month had a transmission duration of 1 second or longer.

*Finally*, CMDC notes that it has never received any indication that its operations in the lower L-band have interfered with any marine broadcasts.

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<sup>2</sup> 47 CFR § 1.3.

<sup>3</sup> *Geologic Solutions, Inc.*, Order and Authorization, DA 06-1179, rel. May 31, 2006, at ¶ 5 (“*Geologic Solutions*”) (citations omitted).

<sup>4</sup> *Id.*

<sup>5</sup> See *Richtec* at ¶ 11.

<sup>6</sup> See, e.g., *Geologic Solutions* at ¶ 7 (maximum time necessary for preemption is 10.34 seconds).

At the same time, grant of this waiver request will serve the public interest. CMDC is the sole supplier of hardware and services for the U.S. Army Logistics Command's Movement Tracking System ("MTS"). MTS is used by U.S. forces in Iraq and around the world for near real-time messaging and location tracking of mobile assets. CMDC's technology and services are also integrated into the U.S. Army's Force XXI Battle Command, Brigade and Below ("FBCB2") command and control systems, also known as Blue Force Tracking ("BFT"). The U.S. Army uses this MTS system as a key part of its overseas deployment training, as well as for logistics tracking in the US. The National Guard has recently adopted the MTS to support its tracking and messaging requirements during disaster and recovery operations at the local, state and national levels due to the MTS's superior performance and widespread Army use. CMDC's system is also used by commercial entities operating in remote areas, particularly in the field of energy development. Grant of this waiver request will enable CMDC to continue to provide these critical services to the U.S. Army, National Guard, and energy companies.

In light of these facts, it is clear that there is good cause for grant of CMDC's waiver request. CMDC respectfully asks that the Commission grant this request.

**Information Required by 47 C.F.R. § 25.137 – Question 42**

CMDC has entered into commercial agreements to use the Canadian-licensed satellite, MSAT-1, to provide service in the United States. CMDC therefore makes the following statements in response to Question 42(a).

Section 25.137(a)(1) – MSAT-1 is licensed in Canada. A response to 25.137(a)(2) is not required in this instance, as Canada is a member of the World Trade Organization, and the services that CMDC seeks to provide are covered under the World Trade Organization Basic Telecommunications Agreement.

Section 25.137(b) – Legal and technical information: Attached to this Exhibit C is a screen capture from the FCC Schedule S Application which provides legal and technical information on MSAT-1, and which Mobile Satellite Ventures has advised will satisfy the requirements of this paragraph. In addition, although MSAT-2 is not considered a “non-U.S. licensed” space station, attached to this Exhibit C is a screen capture of Schedule S information for MSAT-2.

Section 25.137(d) – Compliance with other requirements: MSAT-1 is in orbit and operational. As such, the information required by this paragraph regarding compliance with milestone requirements, reporting requirements, other service rules, and bond requirements is a matter of record before the Commission.

**Description of Service – Question 43**

By this Application, CMDC requests authority to modify its existing L-band blanket license (E990143), granted on January 18, 2001 in FCC File No. SES-LIC-199990216-00488. CMDC's existing license allows CMDC to operate up to 25,000 half-duplex data MESs in CONUS, Alaska, and Hawaii on upper L-band frequencies via MSAT-1. By this Application, CMDC proposes to modify its license to add the lower L-band frequencies, new antennas, and an additional point of communication, MSAT-2. As discussed in the request for special temporary authority being filed concurrently with the submission of this Application, CMDC is already operating on the lower L-band frequencies and on MSAT-2, in many cases using the antennas that are the subject of this Application. As such, CMDC is seeking this approval *nunc pro tunc*.

Grant of this Application will enable CMDC to continue to provide its mobile data communications services to its customers, most notably the U.S. military. CMDC is the sole supplier of the U.S. Army Logistics Command's Movement Tracking System ("MTS"). MTS is currently being used by U.S. forces in Iraq and around the world for near real-time messaging and location tracking of mobile assets. In addition, pursuant to contracts with a major U.S. prime contractor and related subcontractors, as well as contracts with the U.S. Army, CMDC's products and services have been integrated into the U.S. Army's Force XXI Battle Command, Brigade and Below ("FBCB2") command and control systems, also known as Blue Force Tracking ("BFT"). Also, CMDC is currently supplying equipment and services to a small number of commercial customers.