

APPLICATION FOR EARTH STATION SPECIAL TEMPORARY AUTHORITY

APPLICANT INFORMATION Enter a description of this application to identify it on the main menu:
MET units, initial 30 days (June 2009)

1. Applicant

Name:	TerreStar License Inc.	Phone Number:	703-483-7800
DBA Name:		Fax Number:	
Street:	12010 Sunset Hills Road	E-Mail:	doug.brandon@terrestar.com
City:	Reston	State:	VA
Country:	USA	Zipcode:	20190 -
Attention:	Mr Douglas I Brandon		

With Conditions



File # SES-STA-20090604-00690

Call Sign E060430 Grant Date 7/7/09
(or other identifier)

From 7/7/09 Term Dates To: 8/5/09

Approved: Kathy Mackey

Chief, Satellite Engrg Br.

Attachment

SES-STA-20090604-00690
E060430

Conditions:

Operation in the 2180 – 2200 portion of the band is limited to the specific frequencies identified in the STA request which covers the TerraStar-1 Satellite (SES-STA-20090523-00646) and is conducted on a non-interference basis with respect to existing fixed terrestrial stations.

Operation in the 2000-2010 MHz band is limited to the specific frequencies identified in the STA request and to markets where BAS stations within that market, and nearby potentially affected markets, have been relocated.

Grant of STA is for MSS testing only, no ATC operation allowed.

All operations shall be on an unprotected and non-harmful interference basis, i.e., TerreStar License Inc. shall not cause harmful interference to, and shall not claim protection from, interference caused to it by any other lawfully operating station and it shall cease transmission(s) immediately upon notice of such interference.

With Conditions



File # SES-STA-20090604-00690

Call Sign E060430 Grant Date 7/17/09
(or other identifier)

Term Dates
From 7/17/09 To: 8/15/09

Approved: *[Signature]*
Chief, Satellite Bureau BR

2. Contact	
Name: Joseph A. Godles, Esq.	Phone Number: 202-429-4900
Company: Goldberg Godles Wiener & Wright	Fax Number: 202-429-4912
Street: 1229 19th Street, NW	E-Mail: jgodles@g2w2.com
City: Washington	State: DC
Country: USA	Zipcode: 20036 -2413
Attention:	Relationship: Legal Counsel
(If your application is related to an application filed with the Commission, enter either the file number or the IB Submission ID of the related application. Please enter only one.)	
3. Reference File Number SESLIC2006120602100 or Submission ID	
4a. Is a fee submitted with this application?	
<input checked="" type="radio"/> If Yes, complete and attach FCC Form 159. If No, indicate reason for fee exemption (see 47 C.F.R. Section 1.1114).	
<input type="radio"/> Governmental Entity <input type="radio"/> Noncommercial educational licensee	
<input type="radio"/> Other (please explain):	
4b. Fee Classification CGB – Mobile Satellite Earth Stations	
5. Type Request	
<input checked="" type="radio"/> Use Prior to Grant <input type="radio"/> Change Station Location <input type="radio"/> Other	
6. Requested Use Prior Date 07/08/2009	
7. City Various	8. Latitude (dd mm ss.s h) 0 0 0.0

9. State	10. Longitude (dd mm ss.s h) 0 0 0.0
11. Please supply any need attachments. Attachment 1: STA Attachment 2: Attachment 3:	
12. Description. (If the complete description does not appear in this box, please go to the end of the form to view it in its entirety.) <div style="border: 1px solid black; padding: 5px; margin: 5px 0;">TerreStar License Inc. (TerreStar), pursuant to Section 25.120 of the Commission's rules, hereby requests Special Temporary Authority (STA) for a period of 30 days, commencing on July 8, 2009, to operate mobile earth terminals (METs) in the manner described herein.</div>	
13. By checking Yes, the undersigned certifies that neither applicant nor any other party to the application is subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Act of 1988, 21 U.S.C. Section 862, because of a conviction for possession or distribution of a controlled substance. See 47 CFR 1.2002(b) for the meaning of "party to the application"; for these purposes. <input checked="" type="radio"/> Yes <input type="radio"/> No	
14. Name of Person Signing Douglas I Brandon	15. Title of Person Signing General Counsel and Senior Vice President
WILLFUL FALSE STATEMENTS MADE ON THIS FORM ARE PUNISHABLE BY FINE AND / OR IMPRISONMENT (U.S. Code, Title 18, Section 1001), AND/OR REVOCATION OF ANY STATION AUTHORIZATION (U.S. Code, Title 47, Section 312(a)(1)), AND/OR FORFEITURE (U.S. Code, Title 47, Section 503).	

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REQUEST FOR SPECIAL TEMPORARY AUTHORITY

TerreStar License Inc. (“TerreStar”), pursuant to Section 25.120 of the Commission’s rules, hereby requests Special Temporary Authority (“STA”) for a period of 30 days, commencing on July 8, 2009, to operate mobile earth terminals (“METs”) in the manner described herein. The METs will communicate with TerreStar-1, a Canadian-licensed satellite as to which TerreStar holds a letter of intent authorization (Call Sign S2633) to serve the United States.¹ TerreStar seeks authority to operate the METs in any market in which relocation of 2 GHz broadcast auxiliary stations has been completed.² Grant of this STA request will enable TerreStar to test and demonstrate the METs prior to the start of commercial operations and to initiate communications with TerreStar-1 as required by the milestones for the satellite.³

Table 1 below provides the technical specifications for the operation of the METs pursuant to the proposed STA. The METs will transmit on the 2 GHz frequencies identified in Table 1, which are in the 2000-2010 GHz service band that will be used by TerreStar’s network. Operations envisioned for the STA period consist of MET to MET VoIP calls and interactive HTTP data session between Internet web sites and METs. A brief description of the test plan is provided below.

To maximize the benefits of its testing, TerreStar proposes to operate two types of METs. The first type of MET is a prototype of the handsets that will be used by TerreStar’s customers when commercial operations begin. The second type of MET is a Commercial Off-The-Shelf (“COTS”) modem attached to an antenna that has been configured for 2 GHz operations. TerreStar seeks authority to use up to 20 of the prototype METs and up to five of the COTS modem/antenna combinations.

¹ TerreStar has pending an application for a blanket license to operate up to two million (2,000,000) METs. See File No. SES-LIC-20061206-02100 (subsequently amended by SES-AMD-20061214-02179, SES-AMD-20070309-00336, SES-AMD-20070508-00582, SES-AMD-20070723-00978, SES-AMD-20070907-01253, and SES-AMD-20080229-00217).

² See *In the Matter of Improving Public Safety Communications in the 800 MHz Band; Consolidating the 800 and 900 MHz Industrial/Land Transportation and Business Pool Channels; Amendment of Part 2 of the Commission’s Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, including Third Generation Wireless Systems; Amendment of Section 2.106 of the Commission’s Rules to Allocate Spectrum at 2 GHz for use by the Mobile Satellite Service*, Memorandum Opinion and Order and Further Notice of Proposed Rulemaking, FCC 08-73 (rel. Mar. 5, 2008).

³ See File No. SAT-MOD-20080718-00143 (extending until August 30, 2009, the milestone by which TerreStar’s system must be operational).

Network operations during the STA period, in addition to the METs, will use common hardware components of the Satellite Access Network (SAN) deployed in Las Vegas. All radio-based portions of the network will be operated pursuant to licensed parameters or parameters authorized pursuant to STAs (TerreStar has requested STAs in connection with in-orbit testing for TerreStar-1). The SAN elements include: the TerreStar-1 space station, a 9.3m Ku band gateway earth station in North Las Vegas, the Satellite Beam Access Subsystem (S-BAS) and the Satellite Base Station Subsystem (S-BSS). In addition, the COTS modem/ antenna METs will utilize standalone S band transmit and receive antennas, filters, amplifiers and S band to IF up/down converters. The primary function of the S-BAS is to implement ground based beam forming (GBBF) -- *i.e.*, the formation and control of spot beams. Although full configuration of GBBF will not occur until after satellite payload testing is complete, S-BSS Forward and Return GBBF ports will be configured to route the ITC over single element beams transmitting to the gateway (Feed Element 46) and receiving from the gateway (Feed Element 61).

The S-BSS provides an interface into the core 3G General Packet Radio Service (GPRS) network supporting network control functions and connections to upstream GPRS Support Nodes (GGSN) and Serving GPRS Support Nodes (SGSN). The S-BSS modulates and demodulates user traffic, provides load and congestion control for satellite beams and executes admission control for S band radio links. During MET operations, the S-BSS will establish frequencies for two symmetric GMR-3G control and traffic carriers in the forward and return directions to provide connectivity between ground facilities and the single elemental beams described above.

The following block diagram depicts at a high-level the common hardware elements:

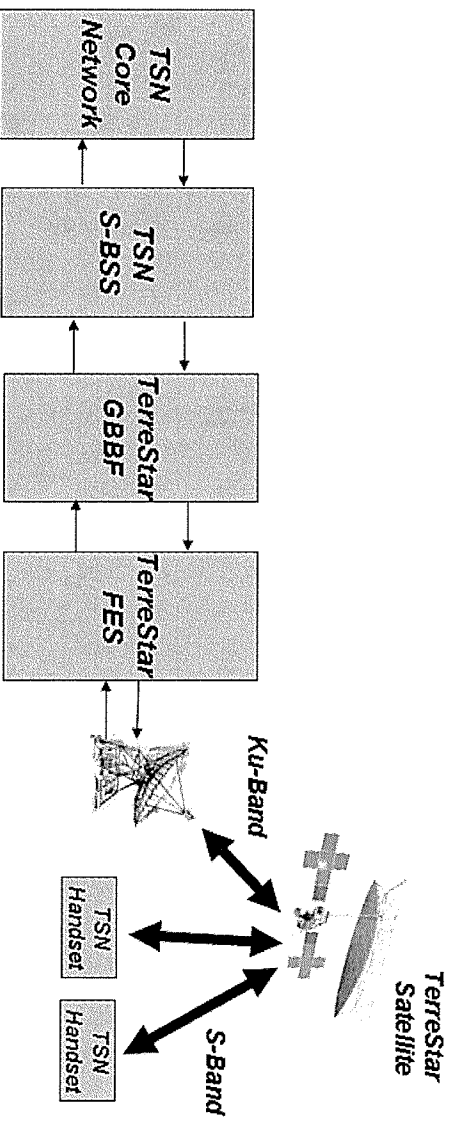


Figure 1 Hardware Block Diagram for Handset PTS Testing

Grant of the requested STA will enable TerreStar to conduct mobile-to-mobile satellite VoIP calls between two TerreStar METs where Handset-A completes a voice call to Handset-B using facilities in Figure 1 together with Core IP Network facilities described below. A grant also will make it possible for TerreStar to complete interactive data sessions using the web browser resident in the TerreStar MET handset. The MET prototype operations will utilize the resources described above which are integrated with TerreStar's Core IP Mobility Network. The IP Core router network is hosted by Cisco and anchored by GPRS facilities located at the Las Vegas gateway and at TerreStar's Richardson, TX Network Operations Center (NOC). The gateway and NOC have global IP connectivity and peering via dedicated network facilities purchased from Level 3 Communications. TerreStar's Core IP Network includes a media gateway and a VoIP application server provided by Broadsoft which exchange and backhaul IP or time division multiplexed (TDM) traffic. The environment for the COTS modem/antenna operations will be supplemented by consumer grade LAN routers and VoIP gateways necessary to originate or terminate SIP handoffs between the IP Core and the METs that will have a resident IP address managed as a locally attached extension by the VoIP server. Both types of MET will be equipped with SIM cards recognized by the network.

During the mobile-to-mobile satellite VoIP calls, the METs will exchange and/or acknowledge network attachment, SIP registration and channel assignment with the SGSN and downstream IP Network devices to verify that MET handset A and B have been registered with the Core IP Network and VoIP server using a secure attachment protocol. MET A will dial a pre-designated number which will route the call via the satellite to a VoIP server at the Richardson NOC. MET A will send a ring tone and the handset will display "Connected", MET B will display "Incoming Voice Call" and upon answering both METs will display "Connected". The technical characteristics of the call between MET A and MET B will be recorded by the test team. MET A will then initiate call termination by pushing "End Call" on the handset. Similarly, for the interactive data session, a similar sequence of network attachment steps will occur as the MET secures access and acknowledgement of connection to the SAN followed by connection to a pre-designated web address. The web page should be displayed.

The COTS modem/antenna will be used to test and demonstrate two satellite call types: First, a satellite VoIP call will be placed between two VoIP clients [Cisco IP Phone 7961 Series] using two COTS modems — one on the satellite side and one on the network side connected to a VoIP server in TerreStar's Core IP Network. Second, TerreStar will complete a web browsing data session using two COTS Modems - one on the satellite side and the other on the network side - which will connect a Windows PC connected to the satellite to the TerreStar IP

Network. TerreStar will open the web browser on the PC connected to the COTS Modem to access web sites.

The prototype MET is a handheld device. The COTS modem/antenna is a non-handheld MET employing a higher gain external antenna providing voice and data connectivity to laptops and handhelds. This configuration is typical of a vehicle-mounted MET, and will utilize the common hardware resources shown in Figure 1 in addition to discrete resources beyond those described above for the Primary Approach. Those resources include two COTS Modems (ComTech modelCDM-570-IP), a fifteen inch Micro-Ant S band transmit antenna (Model No. PCA15LR), one IF to S-Band Up-converter (Miteq), one 1 S-Band to IF Down-converter (Miteq), one laptop with VoIP Client for SIP handoffs, and a POTS Line equipped with a VoIP gateway for internet connectivity. The VoIP client, gateway, laptop and POTS line provide access into the TerreStar IP test environment for on-net satellite to off-network PSTN calling. The COTS modem, antenna and baseband IF frequency converters provide the “satellite” connectivity portion of the network that converts, transmits and receives the forward and return link signals to S-band. The COTS Modem operates using a 140 MHz IF and is connected to the IP LAN to enable the laptop and IP phone to function as METs.

The following table provides technical specifications for MET operations under the proposed STA:

Table 1.

Return Path	MET to Satellite Specifications	
MET TYPE - PROTOTYPE HANDSET		
Specifications		
Number of Beams		1.00
Number of Carriers per Beam		2.00
Information Rate per Carrier (Kbps)		2.45
Modulation		BPSK
Occupied Bandwidth per Carrier (KHz)		31.25
Emission Designator		31K3G7W
Uplink Frequency (MHz) Control Channel (MET to TS-1 Uplink)		2007.765
Uplink Frequency (MHz) Voice/Data Channel (MET to TS-1 Uplink)		2007.859
MET Type		Handheld PDA
Antenna Type 1		Planar Inverted F
Antenna Type 1- Max Transmit EIRP per Carrier		5 dBW
Antenna Type 1 -Max Tx EIRP Density per Carrier (dBW/4KHz)		-4 dBW
MET Type		Handheld PDA
Antenna Type 2		External Accessory
Antenna Type 2- Max Transmit EIRP per Carrier		7 dBW
Antenna Type 2 -Max Tx EIRP Density per Carrier (dBW/4KHz)		-2 dBW

MET TYPE - COTS MODEM with 15" FLAT PANEL ANTENNA	
Specifications	
Number of Beams	1.00
Number of Carriers per Beam	2.00
Information Rate per Carrier (kbps)	NA
Modulation	BPSK
Occupied Bandwidth per Carrier (kHz)	115.2 KHz
Emission Designator	200KG7W
Uplink Frequency (MHz) Control Channel (MET to TS-1 Uplink)	NA
Uplink Frequency (MHz) Voice/Data Channel (MET to TS-1 Uplink)	2007.812
MET Type	Portable Vehicle Mount
Antenna Type 1	15" Square Flat Panel
Antenna Type 1 - Max Transmit EIRP per Carrier	20 dBW
Antenna Type 1 -Max Tx EIRP Density per Carrier (dBW/4KHz)	11.5 dBW

The prototype MET is a reference design developed for TerreStar by Elektrobit Corporation (EB). SAR measurement results show that the MET complies with FCC requirements for human exposure to radio frequency electromagnetic fields as defined in §§ 2.1091 and 2.1093 and §§ 1.1307(b) and 1.1310 for satellite communication service devices operating in the S band. The COTS modem/antenna is not subject to SAR, because it is not a handheld device operated in close proximity to the body (rather, it will be mounted on a tripod).