DEFENSE INFORMATION SYSTEMS AGENCY
JOINT INTEROPERABILITY TEST COMMAND
2001 BRAINARD ROAD
FORT HUACHUCA, ARIZONA 85613-7051

IN REPLY
REFER TO Networks, Transmission and
Integration Division (JTE)
(Certification 341.283)

26 Nov 03

Titan Systems Corporation
ATTN: Andrew Ivers
Vice President of Engineering
3033 Science Park Road
San Diego, CA 92121

Dear Mr. Ivers:

MIL-STD-188-181 conformance testing has been completed for the AN/USC-42(V)3(C) Miniaturized Demand Assigned Multiple Access (Mini-DAMA) Terminal. The AN/USC-42(V)3(C) Mini-DAMA Terminal is certified as meeting the applicable requirements of military standard (MIL-STD)-188-181, "Interoperability Standard for Dedicated 5-kHz and 25-kHz UHF Satellite Communications Channels," 2 December 1996, to the extent detailed in the enclosed summary. The tested terminal components and associated software versions were:

Mini-DAMA	AN/USC-42(V)3(C)
Modem	MD-1294(C)(P)/USC-42(V)
System Software Build	Version 6.30
Red Communications Signal Processor (CSP)	Version 6.30
Black Communications Signal Processor (CSP)	Version 6.15
Black Input/Output (I/O)	Version 6.11
Transmission Security (TRANSEC)	Version 5.05
Digital Signal Processor (DSP)	Version 6.16
Communications Security (COMSEC) Module	0N643560
Control Interface	C-12226/USC-42(V)
High Power Amplifier	AM-7544/USC-42(V)

Testing was conducted at the Joint Interoperability Test Command (JITC) Ultra High Frequency (UHF) Satellite Communications (SATCOM) test facility using the JITC procedures "MIL-STD-188-181/MIL-STD-188-181A/MIL-STD-188-181B Terminal Test Procedure," May 2001. A summary of the test results is provided in the enclosed Conformance Certification Testing Summary.

Although the terminals are being certified compliant to MIL-STD-188-181, an operational problem can exist if the transmit power is too high. The operator must ensure the transmit Effective Isotropically Radiated Power (EIRP) levels do not exceed the levels in the table below when operating in narrowband mode, including cable loss and antenna gain.

Table 1. Narrowband EIRP

INPUT/OUTPUT DATA RATE (bps)	MODULATION TYPE	CODING TYPE	MAXIMUM EIRP (dBWi)
*75	SBPSK	None	26.3
*300	SBPSK	None	25.5
*600	SBPSK	None	25.6
1200	SBPSK	None	24.9
2400	SBPSK	None	21.6

*Optional Data Rate
bps = bits per second
dBWi = decibels referenced to 1 watt, relative to isotropically radiated power
EIRP = Effective Isotropically Radiated Power
SBPSK = Shaped Binary Phase-Shift Keying

When operating in wideband mode, the operator must ensure the EIRP level does not exceed the level listed in the table below, including cable loss and antenna gain.

Table 2. Wideband EIRP

INPUT/OUTPUT DATA RATE (bps)	MODULATION TYPE	CODING TYPE	MAXIMUM EIRP (dBWi)
*9600	SBPSK	None	19.5

*Optional Data Rate
bps = bits per second
dBWi = decibels referenced to 1 watt, relative to isotropically radiated power
EIRP = Effective Isotropically Radiated Power
SBPSK = Shaped Binary Phase-Shift Keying

Higher transmit EIRP levels will result in out-of-band emissions that exceed the limits set by the MIL-STD, and may cause friendly jamming in adjacent channels.

In accordance with Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6251.01A, "Ultrahigh Frequency (UHF) Satellite Communications Demand Assigned Multiple Access Requirements," 21 April 2003 users are required to have systems certified compliant to MIL-STD-188-181 series, -182 series, and -183 series. MIL-STD-188-181 conformance testing and certification (85.283, November 1999) was previously completed on the AN/USC-42A(V)3(C) Mini-DAMA Terminal. A JITC certification (117.283, May 2000), based on a white paper analysis, was granted to update the software to the current version. User requirements to upgrade the hardware in the Mini-DAMA Terminal to provide optional embedded COMSEC modules necessitated this re-certification. Sufficient testing was performed to ensure that the hardware

upgrades do not affect the terminal's compliance to the MIL-STD. This certification memorandum declares that the MIL-STD-188-181 portion of the overall Joint Chiefs of Staff mandated requirement has been met for the AN/USC-42(V)3(C) Mini-DAMA Terminal when configured with embedded COMSEC.

Previous testing has demonstrated that even though a product conforms to standards, there is still a potential for incompatibility between UHF terminals that implement technical requirements differently. Therefore, prior to initial operational capability, system users must define the specific system operational requirements, and the system must be tested and certified for interoperability by JITC in accordance with CJCSI 6212.01B, "Interoperability and Supportability of National Security Systems, and Information Technology Systems," 8 May 2000.

JITC distributes test documentation via the JITC Electronic Report Distribution (ERD) system which uses unclassified (NIPRNET) e-mail. More comprehensive information is available via the JITC System Tracking Program (STP). The STP is accessible by .mil/.gov users on the NIPRNET at https://stp.fhu.disa.mil. Test reports, lessons learned, and related testing documents and references are on the JITC Joint Interoperability Tool (JIT) at http://jit.fhu.disa.mil (NIPRNET) or http://199.208.204.125 (SIPRNET). JITC also provides a DAMA Certification Register on the JITC public website under "Product Registers." The DAMA Certification Register can be reached directly at http://jitc.fhu.disa.mil/reg/dama1.html. The UHF SATCOM DAMA Test Facility homepage can be reached directly at http://jitc.fhu.disa.mil/reg/uhfdama.htm.

The testing agent point of contact is Norma Vega, DSN 879-1741, Commercial (520) 538-1741, e-mail vegan@fhu.disa.mil.

Sincerely,

Leslie F. Claudio

LESLIE F. CLAUDIO
Chief
Networks, Transmission and
Integration Division

1 Enclosure:
Conformance Certification
Testing Summary

Copy to:
Joint Chiefs of Staff, Director for Command, Control, Communications and Computer Systems (J6), Room 1E833, The Pentagon, Washington, DC 20318-6000
Joint Chiefs of Staff (J6S), ATTN: CDR Brooks, Room IC832, The Pentagon, Washington, DC 20318-6000
Office of the Secretary of Defense, Director Operational Test and Evaluation, Room 3E318, The Pentagon, Washington, DC 20301-1700
Assistant Secretary of Defense (Command, Control, Communications, and Intelligence), ATTN: C3I, The Pentagon, Washington, DC 20301-8000
Defense Information Systems Agency (IN42), ATTN: Andy Pappas, 5600 Columbia Pike, Falls Church, VA 22041-2717

CONFORMANCE CERTIFICATION TESTING SUMMARY
(Certification 341.283)

1. CERTIFICATION TITLE. MIL-STD-188-181 Conformance Certification of the AN/USC-42(V)3(C) Miniaturized Demand Assigned Multiple Access (Mini-DAMA) Terminals.

2. PROPONENT. Titan Systems Corporation
3033 Science Park Road
San Diego, CA 92121

3. PROGRAM MANAGER/USER POC. Andrew Ivers, (858) 552-9914
E-mail: aivers@titan.com

4. TESTERS. Joint Interoperability Test Command (JITC):
Mr. Larry Metz, (520) 538-5215
Mr. Dan Bear, (520) 538-4214
Ms. Norma Vega, (520) 538-1741

5. SYSTEM UNDER TEST DESCRIPTION. The AN/USC-42(V)3(C) Mini-DAMA Terminal provides full-duplex capabilities in both dedicated and Demand Assigned Multiple Access (DAMA) modes of operation. The terminal has eight input/output (I/O) ports which can be independently configured and can be selected for half or full-duplex operations. The terminal provides internal transmission security (TRANSEC) for orderwire encryption in the DAMA mode, and optional embedded Communications Security (COMSEC) for user communications encryption in all modes. The terminal uses an external 100-Watt amplifier, and has one audio Input/Output port that is used for Frequency Shift Keying (FSK) operation in the Dedicated SATCOM mode. The AN/USC-42(V)3(C) provides Ultra High Frequency (UHF) Dedicated and DAMA satellite communication (SATCOM) requirements on aircraft platforms for the United States Navy.

6. TEST NETWORK DESCRIPTION. The test networks varied for each military standard (MIL-STD) requirement being verified. Testers used various configurations with commercial off-the-shelf test equipment to verify each MIL-STD requirement. Detailed test configurations and data collection information are in the appropriate sections of the JITC test plan, “MIL-STD-188-181/MIL-STD-188-181A/MIL-STD-188-181B Terminal Test Procedure,” May 2001. Figure 1 shows the system configuration of the tested equipment.

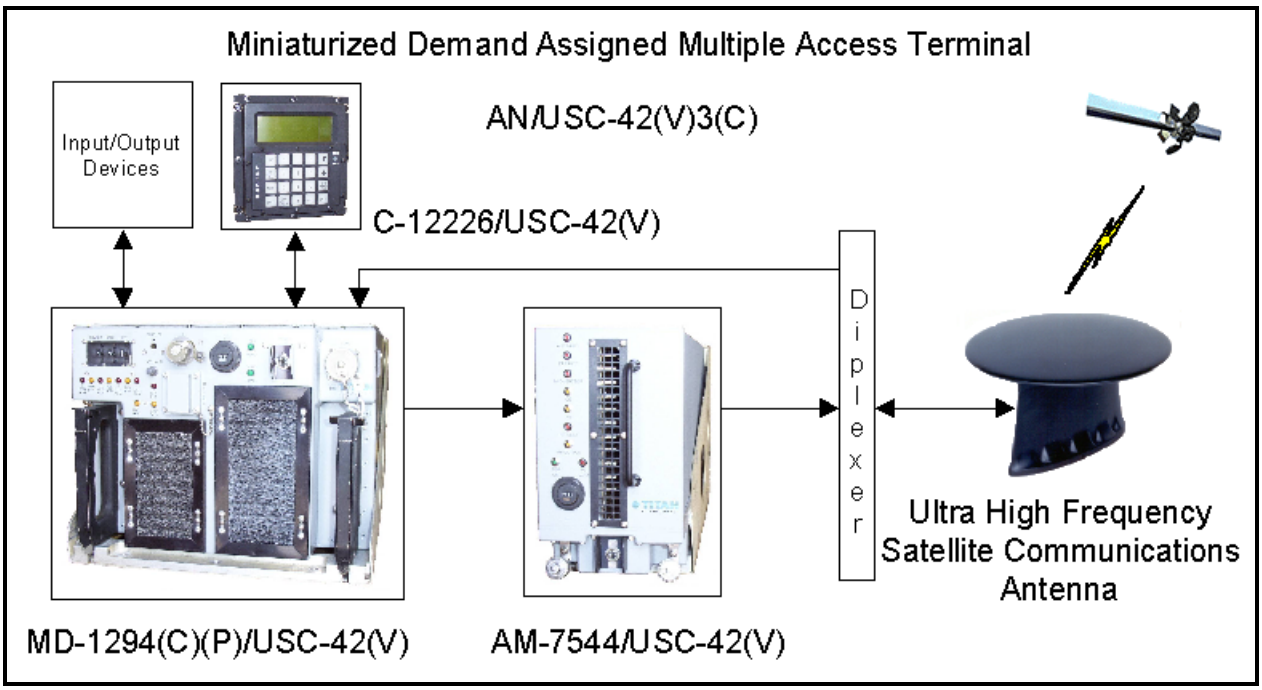

Figure 1. Tested System Configuration

7. SYSTEM CONFIGURATION. Terminal components and software versions include:

Mini-DAMA Terminal	AN/USC-42(V)3(C)
Modem	MD-1294(C)(P)/USC-42(V)
System Software Build	Version 6.30
Red Communications Signal Processor (CSP)	Version 6.30
Black Communications Signal Processor (CSP)	Version 6.15
Black Input/Output (I/O)	Version 6.11
Transmission Security (TRANSEC)	Version 5.05
Digital Signal Processor (DSP)	Version 6.16
COMSEC Module	0N643560
Control Interface	C-12226/USC-42(V)
High Power Amplifier	AM-7544/USC-42(V)

8. MODES OF OPERATION. All MIL-STD-188-181 mandatory and implemented optional data rates and functions have been verified. Optional data rates implemented by this terminal are contained in tables 1 and 2.

9. TESTING LIMITATIONS. None.

10. REQUIRED STANDARDS AND CONFORMANCE. The required standard is MIL-STD-188-181, “Interoperability Standard for Dedicated 5-kHz and 25-kHz UHF Satellite Communications Channels,” 18 September 1992. Table 3 delineates all the MIL-STD requirements and indicates the status as “Met,” “Not Met,” “Not Tested,” or “Not

Applicable." The requirements marked "Previously Met" are requirements determined not to have been affected by the optional COMSEC hardware modifications implemented in the terminal. Sufficient testing has been performed to determine that the AN/USC-42(V)3(C) Mini-DAMA Terminal, when configured with embedded COMSEC, meets the mandatory requirements set forth in MIL-STD-188-181. The following provides details and impacts to some of the noted requirements.

a. Requirement 16, paragraph 5.1.1.4.2, "For carrier EIRP levels equal to or greater than +18 dBW, the maximum EIRP values **shall** not exceed the values as "Maximum EIRP" in table II [of the MIL-STD]."

Table 1. Maximum Narrowband EIRP

INPUT/OUTPUT DATA RATE (bps)	MODULATION TYPE	CODING TYPE	MAXIMUM EIRP (dBWi)
*75	SBPSK	None	26.3
*300	SBPSK	None	25.5
*600	SBPSK	None	25.6
1200	SBPSK	None	24.9
2400	SBPSK	None	21.6

*Optional Data Rate
bps = bits per second
dBWi = decibels referenced to 1 watt, relative to isotropically radiated power
EIRP = Effective Istropically Radiated Power
SBPSK = Shaped Binary Phase-Shift Keying

(1) Met with Comment. As tested, the maximum Effective Isotropically Radiated Power (EIRP) level allowed, including cable loss and antenna gain, to meet the high-power Adjacent Channel Emission (ACE) requirement is specified in table 1 for all narrowband data rates tested.

(2) Impact. Minor. If the terminal is operated at an EIRP level greater than those specified in the table, ACE will potentially cause friendly jamming and transmission disruption in adjacent channels. The EIRP level specified, including cable losses and antenna gain, is normally more than enough power to maintain adequate link quality.

b. Requirement 51, paragraph 5.2.1.4(3), "For carrier EIRP levels equal to or greater than +18 dBW, the maximum EIRP values **shall** not exceed the values specified as "Maximum EIRP" in table IV [of the MIL-STD]."

(1) Met with Comment. As tested, the maximum EIRP level allowed, including cable loss and antenna gain, to meet the high-power ACE requirement is specified in table 2 for all wideband data rates tested.

Table 2. Maximum Wideband EIRP

INPUT/OUTPUT DATA RATE (bps)	MODULATION TYPE	CODING TYPE	MAXIMUM EIRP (dBWi)
*9600	SBPSK	None	19.5

*Optional Data Rate
bps = bits per second
dBWi = decibels referenced to 1 watt, relative to isotropically radiated power
EIRP = Effective Istropically Radiated Power
SBPSK = Shaped Binary Phase-Shift Keying

(2) Impact. Minor. If the terminal is operated at an EIRP level greater than those specified in the table, ACE will potentially cause friendly jamming and transmission disruption in adjacent channels. The EIRP level specified, including cable losses and antenna gain, is normally more than enough power to maintain adequate link quality.

11. TEST AND ANALYSIS REPORT. JITC distributes test documentation via the JITC Electronic Report Distribution (ERD) system which uses unclassified (NIPRNET) e-mail. More comprehensive information is available via the JITC System Tracking Program (STP). The STP is accessible by .mil/.gov users on the NIPRNET at https://stp.fhu.disa.mil. Test reports, lessons learned, and related testing documents and references are on the JITC Joint Interoperability Tool (JIT) at http://jit.fhu.disa.mil (NIPRNET) or http://199.208.204.125 (SIPRNET). JITC also provides a DAMA Certification Register on the JITC public website under "Product Registers." The DAMA Certification Register can be reached directly at http://jitc.fhu.disa.mil/reg/dama1.html. The UHF SATCOM DAMA Test Facility homepage can be reached directly at http://jitc.fhu.disa.mil/reg/uhfdama.htm. The testing agent point of contact is Norma Vega, DSN 879-1741, Commercial (520) 538-1741, e-mail vegan@fhu.disa.mil.

Table 3. MIL-STD-188-181 Requirements Matrix for the AN/USC-42(V)3(C) Mini-DAMA Terminal.

JITC REQ #	MIL-STD Paragraph	REQUIREMENT DESCRIPTION	STATUS
1	4.1(1)	Optional capabilities that are implemented **shall** be in accordance with this MIL-STD.	**Met**
2	4.1(2)	Interoperable access modes **shall** be single access on a satellite channel.	**Previously Met**
3	4.2.1a	a. Narrowband mode. Operation **shall** be limited to a 5-kHz bandwidth (a single 5-kHz channel, or a 5-kHz bandwidth of a 25-kHz or 500-kHz channel, as they are defined in appendix D [of the MIL-STD]), in accordance with [paragraphs] 5.1 through 5.2.8 [of the MIL-STD].	**Previously Met**
4	4.2.1b	b. Wideband mode. Operation **shall** be limited to a 25-kHz bandwidth (a single 25-kHz channel, or a 25-kHz bandwidth of a 500-kHz channel, as they are defined in appendix D [of the MIL-STD]), in accordance with [paragraphs] 5.2 through 5.2.7 [of the MIL-STD].	**Met**
5	4.2.2(1)	For coherent demodulation (narrowband mode), the terminal **shall** transmit a preamble to allow demodulator synchronization before the communications security (COMSEC) synchronization preamble is transmitted.	**Previously Met**
6	4.2.2(2)	A preamble **shall** not be used for FSK modulation in the wideband mode. Note: Mode is not synonymous with channel.	**Previously Met**
7	4.2.3	Hardware implementation of the terminals with imbedded COMSEC **shall** include provisions for future implementation of Over-the-Air Rekeying (OTAR).	**Previously Met**
8	4.2.4	The waveform **shall** interface with maritime satellite (MARISAT) (also known as Gapfiller), fleet satellite communications (FLTSATCOM), leased satellite (LEASAT), and UHF follow-on (UFO) satellites, which are described in FSCS-200-83-1, Navy UHF Satellite Communication System Description, 31 December 1991.	**Previously Met**
9	5.1.1.1(1)	The terminal **shall** be capable of providing eirp of at least 16 dBW with respect to right-hand circular polarization.	**Previously Met**
10	5.1.1.1(2)	The terminal eirp **shall** be incrementally or continuously adjustable from 10 dBW to its maximum with a precision of 1.5 dB or better.	**Previously Met**
11	5.1.1.2	The terminal **shall** maintain an eirp accuracy of ± 1 dB, assuming antenna gain and passive losses are fixed.	**Previously Met**
12	5.1.1.3	The transmitter turn-on time **shall** not exceed 875 μs.	**Previously Met**
13	5.1.1.4	In a nominal 5-kHz bandwidth whose center frequency is displaced by Δf from a terminal transmitter's carrier frequency, the eirp **shall** be as specified below.	**Previously Met**
14	5.1.1.4.1(1)	The eirp (relative to the transmitters total output eirp) **shall** not exceed the values specified as “relative eirp” in table II [of the MIL-STD].	**Previously Met**
15	5.1.1.4.1(2)	These values **shall** apply when the transmitter carrier frequency is either unmodulated, or modulated as specified in table II [of the MIL-STD].	**Previously Met**
16	5.1.1.4.2	For carrier eirp levels equal to or greater than +18 dBW, the maximum eirp values **shall** not exceed the values specified as “maximum eirp” in table II [of the MIL-STD].	**Met (Note)**
Note: The maximum eirp values to meet this requirement are listed in table 1 of the Conformance Certification Testing Summary.			
17	5.1.1.5	The transmit frequency **shall** be tunable in 5-kHz increments over the frequency range of 291.000 to 318.000 MHz.	**Previously Met**

JITC REQ #	MIL-STD Paragraph	REQUIREMENT DESCRIPTION	STATUS
18	5.1.2.1(1)	The terminal **shall** achieve a bit error ratio (BER) of $1x10^{-5}$ or better at the C/kT specified in table III [of the MIL-STD], when operating in the presence of adjacent channel interference (ACI).	**Previously Met**
19	5.1.2.1(2)	For test conditions, ACI power in the desired channel shall be 13 dB below the average power of the desired signal, and **shall** be 2400-bps random-BPSK-modulated. *(Test Parameter)*	**Previously Met**
20	5.1.2.2	The receive frequency **shall** be tunable in 5-kHz increments over a frequency range of 243.000 to 270.000 MHz.	**Previously Met**
21	5.1.2.3(1)	The BER measured at the output of the demodulator **shall** not exceed 1 x 10-5 for a data rate of 2400 bps and a (G/T)1(41N,) of -34.7 dB/K (or -42.4 dB/K for aircraft and submarine installations), assuming a sky noise temperature of 200 K and assuming a 0 dB gain antenna for airborne platforms.	**Met (Note)**
22	5.1.2.3(2)	However, when the performance of the independent components are combined analytically the calculated value of the system performance **shall** meet the requirements of this paragraph.	**Met (Note)**
Note: These requirements are based on a data rate of 2400 bps; all narrowband data rate capabilities of the terminal were verified for compliance based on these requirements. The tested data rate was substituted in the formula to determine the appropriate requirements for compliance. These requirements were tested in the COMSEC mode of operation.			
23	5.1.3(1)	The modulation **shall** be interoperable with BPSK and 50-percent SBPSK (see figure 10-1 in appendix A [of the MIL-STD]) for data rates of 1.2 and 2.4 kbps and, if implemented, for data rates of 75, 300, and 600 bps.	**Previously Met**
24	5.1.3(2)	If a 4.8- or 6.0-kbps rate is implemented, the modulation **shall** be interoperable with OQPSK and 50-percent SOQPSK.	**Not Applicable (Note)**
Note: Optional requirement not implemented in the terminal.			
25	5.1.4.1(1)	The transmitting radio **shall** generate a preamble in accordance with figure 1A or figure 1B [of the MIL-STD].	**Previously Met**
26	5.1.4.1(2)	Baseband data **shall** follow the preamble bit pattern without a shift in data bit timing greater than 25 percent of a bit interval.	**Previously Met**
27	5.1.4.2	The receiving terminal **shall** achieve acquisition and output all baseband data that immediately follows the preamble bit pattern.	**Previously Met**
28	5.1.4.3	The UHF terminal **shall** be able to achieve acquisition and demodulate the carrier for carrier frequency uncertainties up to ± 1.2 kHz.	**Previously Met**
29	5.1.4.4	The probability of achieving acquisition on the first attempt under the conditions of 5.1.4.1, 5.1.4.2, and 5.1.4.3 **shall** exceed 95 percent, with a confidence level of 90 percent.	**Previously Met**
30	5.1.4.5(1)	The UHF terminal **shall** maintain bit synchronization for at least 10 seconds when the $(G/T)/(E_b/N_0)$ is degraded by up to 3 dB from that which is specified in 5.1.2.3, with a confidence level of 90 percent.	**Previously Met**
31	5.1.4.5(2)	The UHF terminal **shall** maintain receive timing stability for 1 second ± 100 ms following loss of carrier.	**Previously Met**
32	5.1.4.6	The UHF terminal **shall** maintain the frequency of its receive clock output to data terminal equipment within ± 1 percent of the clock frequency for the selected operating data rate, under all conditions where bit synchronization can be maintained.	**Previously Met**
33	5.1.5(1)	The frequency generation system **shall** provide long-term plus short-term frequency accuracy within ± 1 part per million (ppm) across the full range of environmental conditions outlined in the terminal specification.	**Previously Met**

JITC REQ #	MIL-STD Paragraph	REQUIREMENT DESCRIPTION	STATUS
34	5.1.5(2)	The root-mean-square value of the phase noise **shall** not exceed 10 degrees over the specified frequency range in a bandwidth of 10 Hz to 15 kHz.	**Previously Met**
35	5.1.5(3)	The spectral containment **shall** be 95 percent in a 5-kHz bandwidth at 2400 bps.	**Previously Met**
36	5.1.6(1)	For 2400-bps voice, the voice digitization **shall** be interoperable with equipment that meets the requirements of Standardization Agreement (STANAG) 4198.	**Previously Met**
37	5.1.6(2)	It **shall** be interoperable with the CV-3591.	**Previously Met**
38	5.1.6(3)	If 4800-bps voice is implemented, the voice digitizer for 4800-bps voice **shall** be interoperable with equipment that meets the requirements of FEDSTD-1016.	**Not Applicable (Note)**
Note: Optional requirement not implemented in the terminal.			
39	5.1.7.1a	[Voice] Mandatory. The COMSEC waveform **shall** be interoperable with the AN/USC-43 (ANDVT) waveform, used in application 3, in accordance with MIL-C-28883A, when transmitting and receiving in the narrowband mode.	**Met**
40	5.1.7.1b	[Voice] Optional. Secure voice at 4800 bps **shall** be interoperable with the digitization techniques used in the Code Excited Linear Prediction (CELP) (FED-STD-1016) and encryption techniques used by the KG-84A (NSA NO. 82-2B).	**Not Applicable (Note)**
Note: Optional requirement not implemented in the terminal.			
41	5.1.7.2a	[Data] Mandatory. The COMSEC waveforms **shall** be interoperable with the AN/USC-43 (ANDVT) waveform used in application 3, in accordance with MIL-C-28883A, when transmitting and receiving in the narrowband mode.	**Met**
42	5.1.7.2b	[Data] Optional. The COMSEC waveforms **shall** be interoperable with the TSEC/KG-84A (NSA NO. 82-2B) waveform when transmitting and receiving in the narrowband mode.	**Met**
43	5.1.8(1)	All baseband data following the preamble bit pattern **shall** be differentially encoded.	**Previously Met**
44	5.1.8(2)	The differential encoding **shall** be as follows: [described in MIL-STD].	**Previously Met**
45	5.2.1.1(1)	The terminal **shall** be capable of providing eirp of at least 16 dBW with respect to right-hand circular polarization.	**Previously Met**
46	5.2.1.1(2)	The terminal eirp **shall** be incrementally or continuously adjustable from 10 dBW to its maximum with a precision of 1.5 dB or better.	**Previously Met**
47	5.2.1.2	The terminal **shall** maintain an eirp accuracy of ±1.5 dB, assuming antenna gain and passive losses are fixed.	**Previously Met**
48	5.2.1.3	The transmitter turn-on time **shall** not exceed 875 μs.	**Previously Met**
49	5.2.1.4(1)	For FSK modulation, the total of all emissions outside the 25-kHz channel shall be less than 1 percent of total transmitted power.	**Previously Met**
50	5.2.1.4(2)	For all PSK carrier modulations and bit rates used in a nominal 25-kHz bandwidth channel, with carrier eirp levels less than +18 dBW, the eirp (relative to the carrier eirp) in a 25-kHz band whose center frequency is removed Δf (kHz) from the carrier frequency **shall** not exceed the values specified as "relative eirp " in table IV [of the MIL-STD].	**Previously Met**
51	5.2.1.4(3)	For carrier eirp levels equal to or greater than +18 dBW, the maximum eirp values **shall** not exceed the values specified as "maximum eirp " in table IV [of the MIL-STD].	**Met (Note)**
Note: The maximum eirp values to meet this requirement are listed in table 2 of the Conformance Certification Testing Summary.			

JITC REQ #	MIL-STD Paragraph	REQUIREMENT DESCRIPTION	STATUS
52	5.2.1.4d	Data rates higher than 38.4 kbps **shall** have adjacent channel emissions within the limits of table IV [of the MIL-STD].	**Not Applicable (Note)**
Note: Optional requirement not implemented in the terminal.			
53	5.2.1.5	The transmit frequency **shall** be tunable in 25-kHz increments over a frequency range of 291.000 to 318.000 MHz.	**Previously Met**
54	5.2.2.1(1)	The terminal **shall** achieve a BER of 1 X 10-5 or better at the C/kT specified in Table V when operating in the presence of ACI at a 50-kHz offset.	**Previously Met**
55	5.2.2.1(2)	For test conditions, ACI power in the desired channel **shall** be 20 dB below the average power of the desired signal, and **shall** be 19.2-kbps BPSK. *(Test Parameter)*	**Previously Met**
56	5.2.2.2	The receive frequency **shall** be tunable in 25-kHz increments over a frequency range of 243.000 to 270.000 MHz.	**Previously Met**
57	5.2.2.3a(1)	FSK BER. The BER measured at the output of the demodulator **shall** not exceed 1 X 10^{-3} for a data rate of 16 kbps and a $(G/T)/(E_bN_0)$ of -35 dB/K (or -43 dB/K for aircraft and submarine installations), assuming a sky noise temperature of 200 K and assuming a 0 dB gain antenna for airborne platforms.	**Previously Met**
58	5.2.2.3a(2)	However, when the performance of the independent components are combined analytically the system performance **shall** meet the requirements of this paragraph.	**Previously Met**
59	5.2.2.3b(1)	PSK BER. The BER measured at the output of the demodulator **shall** not exceed 1 x 10-5 for a data rate of 19.2 kbps and a $(G/T)/(E_bN_0)$ of -27 dB/K (or -33.4 dB/K for aircraft and submarine installations), assuming a sky noise temperature of 200 K and assuming a 0 dB gain antenna for airborne platforms.	**Met (Note)**
60	5.2.2.3b(2)	However, when the performance of the independent components are combined analytically the calculated value of the system performance **shall** meet the requirements of this paragraph.	**Met (Note)**
Note: These requirements are based on a data rate of 19200 bps; all wideband data rate capabilities of the terminal were verified for compliance based on these requirements. The tested data rate was substituted in the formula to determine the appropriate requirements for compliance. These requirements were tested in the COMSEC mode of operation.			
61	5.2.3(1)	The modulation **shall** be as shown in Table V [of the MIL-STD].	**Previously Met**
62	5.2.3(2)	The FSK modulation characteristics **shall** be as specified in 5.2.3.1, 5.2.3.2, and 5.2.3.3.	**Previously Met**
63	5.2.3.1	The system **shall** be interoperable with terminals that have a nominal deviation of ± 5.6 kHz at a 16-kbps modulation rate.	**Previously Met**
64	5.2.3.2	A "1" **shall** be indicated by a voltage that is negative with respect to the reference point, and a "0" by a voltage that is positive with respect to the reference point.	**Previously Met**
65	5.2.3.3	The transmitting terminal **shall** deviate the frequency positive (high) when the data is 0 and negative (low) when the data is 1	**Previously Met**
66	5.2.4.1(1)	The transmitting radio **shall** generate a preamble in accordance with figure 3 [of the MIL-STD] [for PSK modulation].	**Previously Met**
67	5.2.4.1(2)	Baseband data **shall** follow the preamble bit pattern without a shift in data bit timing greater than 25 percent of a bit interval.	**Previously Met**
68	5.2.4.2	The receiving terminal **shall** achieve acquisition and output all baseband data that immediately follows the preamble bit pattern.	**Previously Met**
69	5.2.4.3	The UHF terminal **shall** be able to achieve acquisition and demodulate the carrier for carrier frequency uncertainties up to ± 1.2 kHz.	**Previously Met**

JITC REQ #	MIL-STD Paragraph	REQUIREMENT DESCRIPTION	STATUS
70	5.2.4.4	The probability of achieving acquisition on the first attempt under the conditions of 5.2.4.1, 5.2.4.2, and 5.2.4.3 **shall** exceed 95 percent, with a confidence level of 90 percent.	**Previously Met**
71	5.2.4.5(1)	The UHF terminal **shall** maintain bit synchronization for at least 10 seconds when the $(G/T)/(E_bN_0)$ is degraded by up to 3 dB from that which is specified in 5.2.2.3, with a confidence level of 90 percent.	**Previously Met**
72	5.2.4.5(2)	The UHF terminal **shall** maintain receive timing stability for 1 second ±100 ms following loss of carrier.	**Previously Met**
73	5.2.4.6	The UHF terminal **shall** maintain the frequency of its receive clock output to data terminal equipment within ± 1 percent of the clock frequency for the selected operating data rate, under all conditions where bit synchronization can be maintained.	**Previously Met**
74	5.2.5	The frequency generation system **shall** provide long-term plus short-term frequency accuracy within ± 1 ppm across the full range of specified environmental conditions.	**Previously Met**
75	5.2.6	Secure voice at 16000 bps **shall** be interoperable with the digitization techniques using Continuous Variable Slope Delta (CVSD) modulation as used by the VINSON (CSESD-14).	**Met**
76	5.2.7	The COMSEC device **shall** be interoperable with the TSEC/KY-57 and TSEC/KY-58.	**Met**
77	5.2.7.1	[Voice] Secure voice at 16000 bps **shall** be interoperable with the digitization techniques using Continuous Variable Slope Delta (CVSD) modulation and encryption techniques used by the VINSON (CSESD-14).	**Met**
78	5.2.7.2a	[Data] Mandatory: The COMSEC waveforms **shall** be interoperable with the TSEC/KY-57/58, VINSON (CSESD-14), waveform when transmitting and receiving in the wideband mode.	**Met**
79	5.2.7.2b	[Data] Optional. The COMSEC waveforms **shall** be interoperable with the TSEC/KG-84A (NSA NO. 82-2B) waveform when transmitting and receiving in the wideband mode.	**Met**
80	5.2.8a	For PSK modulations and bit rates used in a nominal 25-kHz bandwidth all baseband data following the preamble bit pattern **shall** be differentially encoded.	**Previously Met**
81	5.2.8b	The differential encoding **shall** be as follows: [described in MIL-STD]	**Previously Met**

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