

	DOCUMENT HISTORY							
REV	DESCRIPTION	DATE	APPROVED					
1	Preliminary Release	14-May-20						

	ORIGINATOR	DATE					
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	APPROVED	DATE	TITLE				
			Level 3A Maintenance Procedures		Procedures at	at FSP,	
	DO NOT SCALE DRAWING WORK FROM DIMENSIONS			DSO TS	GT		
			CAGE CODE	DWG NO.		REV	
	USED OR REPRODUCED IN A METHOD, WITHOUT THE WRIT	ANY FORM, BY ANY ITTEN AUTHORIZATION	02MQ7	11137-01	610-031	1	
	OF GLOBECOMM SYS	STEMS, INC.	S	CALE: NONE	SHEET: 1 OF	126	
ΑΚΡΙΒΕΣ ΑΝΤΙΓΡΑΦΟ Ο υπάλληλος της Μ.Α. ΝΑΤΟ Σταύρος Τσάκωνας ΕΠ&ΠΛ.Α΄	N	ATO UNCLAS	SIFIED				

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Level 3A Maintenance Procedures at FSP

DSO TSGT

Revision 1

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ABOUT THIS DOCUMENT

This document describes the DSO TSGT preventive maintenance procedures to be performed by a Level 1 Operator.

CAUTION ICON

A Caution icon in the manual indicates a hazardous situation that if not avoided, may result in injury. A Caution icon may also be used to indicate other unsafe practices or risks of damage to the TSGT equipment.



POTENTIAL HAZARDS AND SAFETY PRECAUTIONS

While all precautions have been taken by Globecomm Systems, Inc to eliminate and identify potential safety hazards in the TSGT System, personnel should exercise caution when installing, operating and servicing the equipment.

Care should be taken to prevent injury from electrical shock, pinch points and RF Radiation. Globecomm Systems, Inc is not liable for any damage or injury arising from a technician's failure to follow instructions contained in this document or his or her failure to exercise due care and caution in the installation, operation and service of the TSGT equipment. Globecomm Systems, Inc shall not be responsible for injury or damage resulting from improper procedures or from the use of improperly trained or inexperienced personnel performing such tasks.

This document is intended as a general guide for trained and qualified personnel who are aware of the dangers of handling potentially hazardous electrical and electronic circuits. This document is not intended to contain a complete statement of all safety precautions that should be observed by personnel in using this or other electronic equipment.

This system is integrated with high power amplifiers of traveling wave tubes and other high power amplifier technology and is capable of transmitting microwave energy at varying power levels. If transmitting microwave power, Globecomm Systems, Inc cautions the end-user to review all applicable local, federal and international regulations and to comply with all such regulations in the operation and maintenance of the integrated system.

The electrical currents and voltages associated with the equipment, whether supplied by Globecomm Systems, Inc or others, are dangerous. Personnel must, at all times, observe safety regulations.

SAFETY GUIDELINES

• Do not remove, short-circuit or tamper with interlock switches on access covers, doors, enclosures, gates, panels or shields.

- Keep away from live circuits.
- Know your equipment and do not take risks.
- Always remove all power to the system prior to working on the antenna, the reflector assembly, the reflector backup assembly or the feed assembly.

RF Radiation Lockout Perimeter

The TSGT antenna radiating surfaces can produce non-ionizing radiation levels more than maximum recommended exposure levels.

To determine the minimum 'safe' distance from the antenna requires calculating the Power Density in the direction of personnel or the object of concern. Minimum information required to calculate the Power Density is the distance to the object, angular offset of the antenna RF bore-sight to the object, and operating power levels. Formulae for calculating Power Density may be found in AECTP 250 Edition 1, Leaflet 258.

A simplified approach to determining safe area boundaries considers a baseline operating condition where only the lower limit of operational elevation angle is required. Baseline operating conditions are established for the T-1 and T-2 configurations as follows;

<u>Configuration</u>	<u>T-1</u>	<u>T-2</u>
Antenna	4.6m	2.4m
Antenna Centreline Height	3.1m	3.3m
HPA Configuration	1:1 Phase	1:1 Phase
	Combined	Combined
Maximum TSGT EIRP	79 dBW	68 dBW
Near Field Length	148m	41m
Distance to Far Field	355m	97m
Max. Power Density Near Field	14 mW/cm ²	19 mW/cm ²
Max. Power Density Far Field	34 mW/cm ²	3 mW/cm ²

The baseline operating configurations result in radiation levels more than maximum recommended exposure levels when in line with the antenna main lobe. The antenna main lobe is a cone shaped projection assumed to have the same dimensions as the antenna main reflector.



Antenna Main Lobe Projection

Due to the directivity of the radiated power a zone perimeter can be established by adhering to a few simple rules.

1. Never operate below a 5° antenna elevation angle

- 2. Always assume maximum transmitter power
- 3. Always verify the main lobe is not in line with personnel or buildings.
- 4. Always consider the main lobe to be twice the diameter of the antenna at distances of twice the antenna diameter
- 5. Always consider the radiation field extends a minimum of 500m
- 6. Always wear your personal Radiation Monitor when working on or around an operating TSGT



TSGT Radiation Zone Perimeter

Antenna Operational Elevation Angle	<u>T-'</u> Minimum S Dimensi	<u>1</u> Safe Area Ion (m)	<u>T-2</u> Minimum Safe Area Dimension (m)		
()	Length (L)	Width (W)	Length (L)	Width (W)	
5	38	9	14	5	
10	19	9	7	5	
15	12	9	5	5	
20	9	9	4	3	
25	7	5	3	3	
30	6	5	2	3	
35	5	5	2	3	
40	4	5	2	3	
45	3.5	5	2	3	
	TOOT De l'etter	7	·		

TSGT Radiation Zone Perimeter Dimensions

The TSGT setup procedure calls for a "Lockout Perimeter" to be established around the terminal to protect personnel from RF radiation.

RF Radiation Monitor

A personal RF Radiation Monitor is provided with the TSGT and should be worn at all times by any personnel working around a transmitting TSGT.

Emergency Power Off Controls

The TSGT is equipped with Power Emergency Off (EPO) switches at both the TSGT Container and the T-1 Extension Trailer.

One TSGT Container Emergency Power Off button is located on the Power ETB as illustrated below. <u>Depressing this button cuts of all power to the TSGT terminal and should only be used in the event of an emergency</u>.



TSGT Container Power ETB Emergency Power Off

A second TSGT Container Emergency Power Off button is located the Left Side of the TSGT Container as illustrated below. <u>Depressing this button cuts of all power to the TSGT terminal and should only be used in the event of an emergency</u>.



TSGT Container Left Side Emergency Power Off

TSGT Container Left Side Emergency Power Off

A third TSGT Container Emergency Power Off button is located the Right Side of the TSGT Container as illustrated below. <u>Depressing this button cuts of all power to the TSGT terminal and should only be used in the event of an emergency</u>.

TSGT Container Right Side



TSGT Container Right Side Emergency Power Off

The T-1 Extension Trailer is equipped with an Emergency Power Off button located at the front of the Trailer Power Panel and illustrated below. <u>Depressing this button cuts</u> of all power to the T-1 Extension Trailer and should only be used in the event of an <u>emergency</u>.



T-1 Trailer Emergency Power Off

T-1 Extension Trailer Power ETB Emergency Power Off Button

Emergency Power Off Protection Switches

The TSGT is equipped with Power Emergency Off (EPO) protection switches at the TSGT Container. If any of these switches are activated, all power to the TSGT is shut off.

- Dirty Power Panel Plate
- Clean Power Panel Plate
- Dirty Power Vault Access (TSGT Container centre aisle)
- Clean Power Vault Access (TSGT Container centre aisle)

Safety Procedures

The following safety procedures are listed to remind those performing any work on the antenna system that safety rules must be observed. Failure to observe safety rules may result in serious injury or death. Always work safely and in accordance with established procedures.

- Always wear the RF Radiation Monitor when working on or near a TSGT terminal.
- Care shall be taken in all operations to safeguard other people as well as property and to comply with all local safety procedures as established by the customer's site representative, as well as local building codes and fire protection standards.
- Never make internal adjustments or perform maintenance or service when alone or fatigued.
- Do not stand in the direct path of the feed system when the system is transmitting!
- Do not work on the feed system when the TSGT is transmitting!

WIND SPEED WARNINGS

T-1 4.6m Antenna

The T-1 4.6m antenna should not be deployed in wind speeds more than **10 m/s (36 km/h)**.

The T-1 4.6m antenna can survive in up to **30 m/s (108 km/h)** winds at any position. In winds above **30 m/s (108 km/h)**, the antenna must be stowed to ensure survival.

If wind speeds are below **10 m/s (36 km/h)**, the T-1 4.6m antenna can be stowed per the procedure described in Section **Error! Reference source not found.** of the DSO TSGT O&M manual.

To stow the T-1 4.6m antenna in winds speeds exceeding **10 m/s (36 km/h)**, the antenna must be stowed by an alternate method where the antenna wings are not folded and secured before the reflector is lowered to its stowed position, as described in Section **Error! Reference source not found.** of the DSO TSGT O&M manual.

T-2 2.4m Antenna

The T-2 2.4m antenna should not be deployed in wind speeds more than **33.5 m/s** (120 km/h).

The T-2 2.4m antenna can survive in up to **33.5 m/s (120 km/h)** winds at any position. In winds above **33.5 m/s (120 km/h)**, the antenna must be stowed to ensure survival.

The T-2 4.6m antenna can be stowed per the procedure described on Section 3.4.2 of the DSO TSGT O&M manual.

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1 LEVEL 3A TSGT MAINTENANCE AT CSSC

Level 3A TSGT Maintenance is the preventive maintenance to be performed every 2 years at the CSSC, including:

- Review of Level 1, and 2 Maintenance Records
- System Set-Up and Power-Up
- Antenna Control Subsystem Tests
- Measurements and Calibrations
 - RF Monitor/Test Panel
 - Tx and Rx Frequency Accuracy
 - Tx Levels and Phase Alignment
 - o Tx Amplitude Response and Slope Equalizer Adjustment
 - o Rx Chain Level Alignment
 - Rx Amplitude Response
- Functionality Checks

1.1 TSGT Training Check

In the space below, please indicate the NCIAA training courses that the Technician(s) performing these procedures has received on the DSO TSGT. Include the name of the Technician(s) and the name and dates of the training course(s).

2 DSO TSGT SAFETY PRECAUTIONS

Before proceeding with this document, read the section on TSGT safety, beginning on page v at the begging of this document.

Personal RF Radiation Meter



The Personal RF Radiation Monitor should be worn at all times while working around a transmitting TSGT Antenna.

To configure the Personal RF Radiation Meter:

- 1. Configure the alarm for Vibrate, Alternating or Audio
- 2. Turn ON the RF Radiation Monitor

Note: While using the RF Radiation Monitor, an operator should not allow their person to be between the monitor and the Antenna for extended periods of time as this could decrease the effectiveness of the monitor. The RF Radiation monitor should not be worn under clothing.

3 REFERENCED DOCUMENTS

The DSO TSGT O&M Manuals are good references to support the procedures in this document.

- 11137-01604-001, Operation and Maintenance (O&M) Manual, TSGT, DAC DSO, Volume 1, 2, and 3.
- 11137-01604-002, Operation and Maintenance (O&M) Manual, TSGT, DCIS DSO, Volume 1, 2, and 3.

4 **REVIEW OF TSGT MAINTENANCE RECORDS**

Maintenance records should have been submitted for TSGT Level 1 and Level 2 maintenance during the past two years. Confirm that these records have been received and reviewed.

Confirm receipt and review of:

- Recent Level 1 Maintenance Records: _____check (✓)
- Recent Level 2 Maintenance Records: _____check (✓)

5 SYSTEM SET-UP AND POWER-UP

5.1 Installation / Visual Inspection

			PROCEDURE / REPORT O	F TEST № 5.1			
TEST NAME: Installation / Visual Inspection		ELEMEN	T UNDER TEST: COMPLETE S	SYSTEM	Serial Nº and/or versio	Serial Nº and/or version:	
PROJECT: TSGT- DSO	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:	
NUMBER		TEST SEQUENCE	E	EXPECTED RESULT	RESULT	REMARKS	
	T-1 Trailer C	hecks Before Disconnecting	g from AMV				
1.	Check Trailer	Brakes and operation.		OK	ОК		
2.	Check Trailer Lights.			ОК	ОК		
	T-1 Trailer and Antenna Inspection						
1.	Inspect Trailer for physical damage, punctures, bodywork. Inform metal workshop on action items if applicable			ОК	ок		
2.	Check T-1 antenna for wear and tear, corrosion, and painting removal available.			ОК	ОК		
3.	Check Transpo	ort support Z braces and tie-dowr	n straps.	ОК	ОК		
4.	Check Air Sus	pension valve system and Air cus	shions operation.	ОК	ОК		
5.	Check Trailer feet and support pins are in place and working properly.			ОК	ОК		
6.	Check Antenna reflector EL Transport support bar and switch operation and lubrication.		ОК	ОК			
7.	Check EL Moto	or Transport support bar and swit	tch operation.	ОК	ОК		
8.	Check Feedbo	om clamps and pads are in good	I condition.	ОК	ОК		

			PROCEDURE / REPORT C	DF TEST № 5.1		
TEST NAME: Installation / Visual Inspection		ELEMEN	T UNDER TEST: COMPLETE S	SYSTEM	Serial Nº and/or versio	n:
PROJECT: TSGT- DSO	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
NUMBER		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS
9.	Check antenna	a feed is placing on stow bracket	ts properly.	ОК	ОК	
10.	Check antenna maintained, sa mechanism wo Check in the L when switch a	a Stow Bracket is in good conditi fe and lubricated properly. Switc orking properly. imit Switch Logic Box that the S ⁻ ctuated.	ion pins and joints are th is functional and locking TOW BRACKET LED is OFF	ок	ок	
11.	Check Antenna Stow bracket, Velocity Switch, pads and spring are in good condition and working properly.			ОК	ок ок	
12.	Check Antenna Feed Waveguide Assembly connections are in good condition, tight and free of corrosion.			ОК	ОК	
	T-1 Trailer P	ositioning				
1.	Position Traile	r.		ОК	ОК	
2.	Install support	feet.		ОК	ОК	
3.	Level Trailer.			ОК	ОК	
4.	Inspect power and signal ETB.			ОК	ОК	
5.	Install and inspect grounding and lightning rod connectivity.		ОК	ОК		
	T-1 Trailer P	repare for Deployment				
1.	Deploy outrigg	ers and level Trailer		ОК	ОК	

			PROCEDURE / REPORT O	F TEST № 5.1		
TEST NAM Visual	TEST NAME: Installation / Visual Inspection ELEMENT UNDER TEST: COMPLETE S		SYSTEM	Serial Nº and/or versio	n:	
PROJECT: TSGT- DSO	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
NUMBER		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS
2.	Remove AZ ar	nd EL stow bars		OK	ОК	
3.	Unclamp feed	noom		OK	ОК	
4	Remove the st	ow bracket safety lanyards		OK	ОК	
5.	Remove X/Z braces			OK	ОК	
	T-2 Container Positioning					
1.	Position Container.			OK	ОК	
2.	Remove top co	over.		OK	ОК	
3.	Unclamp feed	boom.		OK	ОК	
4.	Unlock all door	rs.		ОК	ОК	
5.	Remove and ir	nspect lifting jacks.		ОК	ОК	
6.	Install lifting jac	cks and level Container.		OK	ОК	
7.	Install groundir	ng and inspect grounding and lig	htning rod connectivity.	OK	ОК	
	T-2 Containe	er Prepare for Deployment				
1.	Inspect power damaged/loose	Inspect power and signal ETB and T-1 power and signal wiring harnesses for damaged/loose/incomplete connectors, dust caps, water tightness etc		ОК	ок	
2.	Connect T-2 p Trailer.	ower and signal wiring harness t	o the Container and the	ОК	ОК	

			PROCEDURE / REPORT C	DF TEST № 5.1		
TEST NAME: Installation / Visual Inspection		ELEMEN	T UNDER TEST: COMPLETE S	SYSTEM	Serial Nº and/or version:	
PROJECT: TSGT- DSO	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
NUMBER		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS
3.	Install and con	nect the weather mast assembly	on the Container.	ОК	OK	
4.	Inspect Container for physical damage, punctures, doors, handles, bodywork, weather seals, RF shielding. Inform metal workshop on action items if applicable			ОК	ок	
5.	Check Fibre Patch Panel and fibre connectors			OK	ОК	
6.	 Remove all of the following equipment for calibration: FO reels Power meter and power sensor Spectrum analyser DVM Attenuators (3, 6, 10 and 20 dB) WAN Tester Personal radiation meter 			ОК	ок	
7	Confirm SNs, check calibration stickers, and reinstall test equipment and FO reels with calibrated equipment.					
	WAN Tester		SN OK Installed CAL Sticker OK	ОК ОК ОК		
	Power Meter			SN OK Installed CAL Sticker OK	ОК ОК ОК	

PROCEDURE / REPORT OF TEST Nº 5.1							
TEST NAM Visual	E: Installation / Inspection	ELEMEN	T UNDER TEST: COMPLET	E SYSTEM	Serial Nº and/or versio	n:	
PROJECT: TSGT- DSO	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:	
NUMBER		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS	
	Power Sensor			SN OK Installed CAL Sticker OK	ок ок ок		
	DVM			SN OK Installed CAL Sticker OK	ок ок ок		
	Personal Radiation Monitor			SN OK Installed CAL Sticker OK	ок ок ок		
	MCL Attenuator 3 db.			SN OK Installed CAL Sticker OK	ок ок ок		
	MCL Attenuator 6 db.			SN OK Installed CAL Sticker OK	ок ок ок		
	MCL Attenuator 10 db.			SN OK Installed CAL Sticker OK	ок ок ок		
	MCL Attenuato	or 20 db.		SN OK Installed CAL Sticker OK	ОК ОК ОК		

	PROCEDURE / REPORT OF TEST Nº 5.1							
TEST NAME: Installation / Visual Inspection		ELEMEN	T UNDER TEST: COMPLE	TE SYSTEM	Serial Nº and/or version:			
PROJECT: TSGT-	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
DSO								
NUMBER	R TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS		
				SN OK	ОК			
	Spectrum Anal	lyzer		Installed	OK			
				CAL Sticker OK	OK			
				SN OK	ОК			
	F/O 250meter	HMA 4CH.SM		Installed	ОК			
				CAL Sticker OK	ОК			
				SN OK	ОК			
F/O 250meter HMA 4CH.SM				Installed	ОК			
				CAL Sticker OK	ОК			

5.2 System Power-On and Initial Assessment

	PROCEDURE / REPORT OF TEST Nº 5.2									
TEST NAM and Initial	IE: Power-On Assessment	ELEMEN"	T UNDER TEST: COMPLETE S	SYSTEM Serial Nº and/or ve		ו:				
PROJECT: TSGT-	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
DSO										
NUMBER	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS				
	Pre-Power on Checks									
	Confirm all EP	O Switches are not engaged:								
	At Co	ontainer Power ETB			ОК					
1.	At left	t side of Container		OK	OK					
	At rig	ht side of Container			OK					
	At Trailer ETB				UK					
2.	Confirm all CBs located in the Clean and Dirty Power Distribution Panels are in the OFF position.			OFF	ок					
3.	Confirm all Inv	erter Module CBs are ON.		ON	ОК					
4.	Confirm all CB	s on the Summing and Distribution	on Assembly are ON	ON	ОК					
	System Initia	al Power-On Checks								
1.	Connect MAIN Main Power In	I POWER from the PGS or Comr put on the Power ETB.	mercial Power socket to the	ОК	ок					
2.	Close CB25 ar	nd CB32 at the Clean Power Dist	tribution Panel.	OK	ОК					
3.	Close CB1 at t displayed at th Panel is within	the Dirty Power Distribution Pane le AC Power Meter located in the the range 360 – 440VAC (400V	el. Verify that that the voltage Dirty Power Distribution AC ± 10%)	400VAC ±10%	ок					

	PROCEDURE / REPORT OF TEST № 5.2									
TEST NAM and Initial	IE: Power-On Assessment	ELEMEN	T UNDER TEST: COMPLETE S	SYSTEM Serial Nº and/or version:						
PROJECT: TSGT-	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
DSO										
NUMBER		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS				
4.	Record the readings at the AC Power Meter			3Phase Voltage: VAVG 3Phase Current: IAVG 3Phase Power: KW 3Phase Frequency: Hz.						
	EPO Checks									
1.	Engage the EF • CB1 ; • 48VD	PO Switch located on the PETB a at Dirty Power Distribution Panel DC EPO Switch in LVDS assemb	and confirm the following: trips ly at rear of UPS opens	ОК ОК	ок ок					
2.	Disengage the power to syste	EPO Switch at the Power ETB a	and restore CB1 to apply	ок	ок					
3.	 Engage the EPO Switch located on the Container left side and confirm the following: CB1 at Dirty Power Distribution Panel trips 48VDC EPO Switch in LVDS assembly at rear of UPS opens 			ОК ОК	ок ок					
4.	Disengage the to apply power	EPO Switch on the left side of t r to system.	he Container and restore CB1	ОК	ок					

			PROCEDURE / REPORT O	F TEST № 5.2		
TEST NAM and Initial	ME: Power-On Assessment	ELEMEN	T UNDER TEST: COMPLETE S	SYSTEM	Serial Nº and/or version	ו:
PROJECT: TSGT- DSO	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
NUMBER		TEST SEQUENC	TEST SEQUENCE		RESULT	REMARKS
5.	 5. Engage the EPO Switch located on the Container right side and confirm the following: CB1 at Dirty Power Distribution Panel trips 48VDC EPO Switch in LVDS assembly at rear of UPS opens 			ОК ОК	ок ок	
6.	Disengage the EPO Switch on the right side of the Container and restore CB1 to apply power to system.			ОК	ок	
7.	Close CB9 on the Dirty Power Distribution Panel to apply mains power to the Trailer.			ОК	ок	
8.	Engage the EF	PO Switch on the Trailer.	OK	ОК		
9.	Confirm that C	B1 at the Trailer trips		OK	ОК	
10.	Disengage the	EPO Switch at the Trailer and c	lose CB1.	ОК	ок	
	Power-Up ar	nd Check the ECUs				
1.	Power-up ECL that will trigger	J A, set it to AUTO mode and se heating (above ambient temper	t its temperature to a setting ature by at least 4 degrees).	ОК	ок	
2.	Confirm that E	CU A starts heating and is functi	oning properly.	ОК	ОК	
3.	Set ECU A temperature to a setting that will trigger cooling (below ambient temperature by at least 4 degrees).			ОК	ОК	
4.	Confirm that E	CU A starts cooling and is functi	oning properly.	ОК	ОК	
5.	Set ECU A ten	nperature to +25 degrees.		ОК	ОК	
6.	Power-down E	CU A.		ОК	OK	

			PROCEDURE / REPORT C	F TEST № 5.2		
TEST NAM and Initial	ME: Power-On Assessment	ELEMEN	ELEMENT UNDER TEST: COMPLETE SYSTEM			n:
PROJECT: TSGT- DSO	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
NUMBER		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS
7.	Power-up ECU B, set it to AUTO mode and set its temperature to a setting that will trigger heating (above ambient temperature by at least 4 degrees).			ОК	ОК	
8.	Confirm that E	CU B starts heating and is funct	ioning properly.	ОК	ОК	
9.	Set ECU B ten temperature by	nperature to a setting that will trig y at least 4 degrees).	gger cooling (below ambient	ОК	ок	
10.	Confirm that ECU B starts cooling and is functioning properly.			ОК	ОК	
11.	Set ECU B temperature to +25 degrees.			ОК	ОК	
12.	Power-down E	CU B.		ОК	ОК	
13.	Power-up ECL that will trigger	J C, set it to AUTO mode and se heating (above ambient temper	t its temperature to a setting ature by at least 4 degrees).	ОК	ок	
14.	Confirm that E	CU C starts heating and is funct	ioning properly.	ОК	ОК	
15.	Set ECU C ten temperature by	nperature to a setting that will tri y at least 4 degrees).	gger cooling (below ambient	ОК	ок	
16.	Confirm that E	CU C starts cooling and is funct	ioning properly.	ОК	ОК	
17.	Set ECU C ter	nperature to +25 degrees.		ОК	ОК	
18.	Power-down E	CU C.		ОК	ОК	
19.	Power-up any two ECUs.			ОК	ОК	

	PROCEDURE / REPORT OF TEST Nº 5.2								
TEST NAME: Power-On and Initial Assessment ELEMENT UNDER TEST: COMPLETE S			YSTEM Serial Nº and/or version:		::				
PROJECT: TSGT-	PROJECT: TSGT- DSO TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER: DATE START:		DATE END:			
DSO									
NUMBER		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS			
	Power-Up ar	nd Check the UPS							
1.	At the Clean P one-by-one wh (Faulty rectifie	Yower Distribution Panel, switch O nile monitoring the output voltage rs tend to "pull down" the output	DN rectifiers 1-7 (at CB2-CB8) e at the Rectifier Controller voltage).	54.4 VDC	Voltage:VDC				
2.	Confirm Inverte	ers are powered-on and are not	displaying any faults.	ОК	ОК				
3.	With a (mainte configured as settings as nee	enance) laptop with PowCom inst shown in the PowCom screen ca cessary.	ОК	ок					

			PROCEDURE / REP	ORTO	TEST № 5.2				
TEST NAM and Initial	ME: Power-On I Assessment	ELEMENT	UNDER TEST: COMP	LETE S	YSTEM		Serial Nº and/o	or version:	
PROJECT: TSGT- DSO	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:		CUST	OMER:	DATE STA	RT:	DATE END:
NUMBER		TEST SEQUENCE	E		EXPECTE	D RESULT	RESULI	Г	REMARKS
🖪, Set data	Survey States	ten ins	X	🔄 Set d	ata	the last the			
Set U1-U4; Norma Set U1-U4; Norma Set Set Set Set Set Set Set Set	Adjust limits 1.4 U2 boost: V U3 test: V U4 spare: V U4 spare: V 1 C 2 C 3 C 4 C 5 s alarm: V down V discon.V sconnection 2 [V] sconnection 3 [V]	Battery settings V 54.5 V 56.0 44.0 44.0 4	1.0 44.1 0 10 10 0 49.0 100 gC 49.0 100 gC -10 180 255	Bat C C	Adjust mints lery type: Blocks v	Boost limits Boost time: hour Boost interval:week Boost factor: 11 limit: V 12	tion	Short Interval E Enable Frequency (d Length (min): Deviation (%) Battery curren I Enable Battery Curren System Curren System Curren	Battery Test
	System specific limi Save/Load Setup	ts Update	Cancel		System spe Save/Load	scific limits	Update		Cancel

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	PROCEDURE / REPORT OF TEST Nº 5.2									
TEST NAM and Initia	ME: Power-On I Assessment	ELEMEN	TUNDER TEST: COMPLETE	SYSTEM	Serial № and/or version:					
PROJECT: TSGT- DSO	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
NUMBER		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS				
	Power-Up E	quipment Racks								
1.	Turn on Clean Power Distribution Panel circuit breakers to apply power to the equipment racks. Verify that power has been applied to all racks. • CB15 (Right R1/R2) • CB16 (Right R3/R4) • CB17 (Left R5/R6) • CB20 (Right R1) • CB21 (Right R2/R3) • CB23 (Left R5) • CB24 (Left R6/R7)			ОК	ок					
2.	initial power O	N status.	iem ON and check all having							
3.	Boot T-1 ACU	for T-1 Operation		Boot sequence for T-1	ОК					
4.	Boot T-2 ACU	for T-2 Operation		Boot sequence for T-2	ОК					
5.	T-2 PDU			Initial power up	ОК					
6.	EMS SERVER COMPUTER LMCa			EMS GUI operation Log GUI Revision. REV.2.1.12	ок ок					

PROCEDURE / REPORT OF TEST Nº 5.2									
TEST NAM and Initial	ME: Power-On I Assessment	ELEMEN"	TUNDER TEST: COMPLETE	SYSTEM	Serial № and/or versior	1:			
PROJECT: TSGT- DSO	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
NUMBER		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS			
7.	EMSe 1 MODE	EM		Booting Modems without any alarm	ок				
8.	EMSe 2 MODEM			Booting Modems without any alarm	ок				
9.	EMSe 3 MODEM			Booting Modems without any alarm	ок				
10.	EMSe 4 MODE	EM	Booting Modems without any alarm	ок					
				Windows Win7 prof. operating system starts	ок				
11.	ASNMC LCAm	n SERVER COMPUTER		ASNMC GUI Interface starts. ASNMC VER.1.2.1 iDirect GUI access	ок ок				
				Windows Win7 prof. operating system starts	ок				
12.	ASNMC DWS	CLIENT COMPUTER		ASNMC GUI Interface starts. ASNMC VER.1.2.1	ок ок				
13				OK					
17.									
15	ASNMC NR P			Initial Power up	OK				
16.	ASNMC SWIT	CH		Initial Power up	ок				

PROCEDURE / REPORT OF TEST Nº 5.2										
TEST NAM and Initial	ME: Power-On Assessment	ELEMEN	T UNDER TEST: COMPLE	TE SYSTEM	Serial Nº and/or version	n:				
PROJECT: TSGT-	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
DSO										
NUMBER		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS				
17.	EBEM MODEM#1			Initial power up Check FW version Rev. 02.03.02	ок					
18.	EBEM MODEM#2			Initial Power up Check FW version Rev. 02.03.02	ок					
19.	EBEM MODEM#3			Initial Power up Check FW version Rev. 02.03.02	ок					
20.	EBEM MODEM#4			Initial Power up Check FW version Rev. 02.03.02	ок					
21.	EBEM MODEN	М#5		Initial Power up Check FW version Rev. 02.03.02	ок					
22.	LINE AMPLIFI	ERS		Initial Power up	ОК					
23.	NETCLOCK T	FRS #1		Initial Power up	ОК					
24.	NETCLOCK T	NETCLOCK TFRS #2		Initial Power up	ОК					
25.	SPECTRA TFI	SPECTRA TFRS DISTRIBUTION AMPLIFIER1		Initial Power up	ОК					
26.	SPECTRA TFI	RS DISTRIBUTION AMPLIFIER:	2	Initial Power up	ОК					
27.	GPS ANTENN	IA		Initial Power up	ОК					

PROCEDURE / REPORT OF TEST Nº 5.2									
TEST NAM and Initial	IE: Power-On Assessment	ELEMEN'	T UNDER TEST: COMPLET	E SYSTEM	Serial Nº and/or version	ו:			
PROJECT: TSGT-	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
DSO									
NUMBER	TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS				
28.	(On DAC 1-4) DXC #1 & FO-	MICE EQUIPMENT		Initial Power up	ОК				
29.	(On DAC 1-4) DXC #2 & FO-	MICE EQUIPMENT		Initial Power up	ОК				
30.	(On DCIS & DCAOC) FDMA ROUTER #1			Initial Power up	ОК				
31.	(On DCIS & DCAOC) FDMA Switch #1			Initial Power up	ОК				
32.	(On DCIS & DCAOC) EMS ROUTER #2			Initial Power up	ОК				
33.	(On DCIS & DO EMS Switch #2	CAOC) 2		Initial Power up	ОК				
34.	ORION SYSTE AMP#1 16 PO	EM MANAGEMNET SUBSYSTE RT	Μ	Initial Power up	ок				
35.	ORIONSYSTE	M MANAGEMNET SUBSYSTEI	М	Initial Power up	ок				
36.	BUC A (BLOC	K UP CONVERTER) for T-1		Initial Power up	ОК				
37.	BUC SWITCH	SUC SWITCHING UNIT for T-1		Initial Power up	ОК				
38.	BUC B (BLOC	K UP CONVERTER) for T-1		Initial Power up	ОК				
39.	BUC A (BLOC	3UC A (BLOCK UP CONVERTER) for T-2		Initial Power up	ОК				
40.	BUC SWITCH	ING UNIT for T-2		Initial Power up	ОК				

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PROCEDURE / REPORT OF TEST Nº 5.2									
TEST NAM and Initial	ME: Power-On Assessment	ELEMENT	UNDER TEST: COMPLETE	SYSTEM	Serial Nº and/or version:				
PROJECT: TSGT- DSO	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
NUMBER	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS			
41.	BUC B (BLOC	K UP CONVERTER) for T-2		Initial Power up	ОК				
42.	BDC A (BOCK	DOWN CONVERTER) for T-1		Initial Power up	ОК				
43.	BDC SWITCH	ING UNIT for T-1		Initial Power up	ОК				
44.	BDC B (BOCK	DOWN CONVERTER) for T-1		Initial Power up	ОК				
45.	BDC A (BOCK DOWN CONVERTER) for T-2			Initial Power up	ОК				
46.	BDC SWITCHING UNIT for T-2			Initial Power up	ОК				
47.	BDC B (BOCK DOWN CONVERTER) for T-2			Initial Power up	ОК				
48.	UPLINK EQUA	ALIZER T-1		Initial Power up	ОК				
49.	UPLINK EQUA	ALIZER T-2		Initial Power up	ОК				
50.	SSPA SUBSY	STEM #		Initial Power up	ОК				
51.	SSPA #A			Initial Power up	ОК				
52.	SSPA #B			Initial Power up	ОК				
53.	LNA SUBSYS	ТЕМ		Initial Power up	ОК				
54.	LNA #A			Initial Power up	ОК				
55.	LNA #B			Initial Power up	ОК				
56.	ANTI_ICING S	SYSTEM		Initial Power up	ОК				
57.	DEHYDRATO Check duty cy	R cle and operation of Dehydrator o	n ASNMC	<10%	%				

	PROCEDURE / REPORT OF TEST Nº 5.2								
TEST NAM and Initial	TEST NAME: Power-On and Initial Assessment ELEMENT UNDER TEST: COMPLET		T UNDER TEST: COMPLET	E SYSTEM	Serial Nº and/or version:				
PROJECT:		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
DSO									
NUMBER	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS			
59	CONTAINER A	AND BATTERY TEMP			Container: °C				
50.	Check Container temperature operation on ASNMC.				Battery: °C				
59.	Confirm that the weather information at the ASNMC is accurate.			Correct weather	ОК				
60.	MISC. ALARMS T-2			Initial Power up	ОК				
61.	PGS (POWER	GENERATION SYSTEM) SUB	SYSTEM	Initial Power up	ОК				
62.	T-1 PDU			Initial Power up	ОК				
63.	T-1 PMU			Initial Power up	ОК				
64.	T-1 HPA SUBS	SYSTEM		Initial Power up	ОК				
65.	HPA #A			Initial Power up	ОК				
66.	HPA #B			Initial Power up	ОК				
67.	T-1 LNA SUBSYSTEM			Initial Power up	ОК				
68.	LNA #A			Initial Power up	ОК				
69.	LNA #B			Initial Power up	ОК				

6 ANTENNA CONTROL SUBSYSTEM TESTS

6.1 T-2 Antenna and Antenna Control System

PROCEDURE / REPORT OF TEST Nº 6.1							
TEST NAME: T-2 Antenna and Antenna Control System		ELEMEN	ELEMENT UNDER TEST: T-2 Antenna Subsystem		Serial Nº and/or version:		
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:	
STEP	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS	
	Note : Reference 600-1219 Rev B 2_4m O-M MANUAL and NCIA CSSC EMB TSS PMI procedures for questions on configuring TSGT for antenna operation.						
	T-2 Antenna II	a Inspection and Maintenance					
1.	Check PDU for la	label indicating that it has been ruggedized.		OK	OK		
2.	Check antenna F	ntenna Feed Membrane and Air leakage		Less than 10% Duty Cycle on dehydrator	ок		
3.	Inspect Azimuth	h and El gear boxes for leakage.		ОК	ОК		
4.	Check Elevation	heck Elevation Hand Crank operation is smooth and quiet.		ОК	ОК		
5.	Check Azimuth H	zimuth Hand Crank operation is smooth and quiet.		ОК	ОК		
6.	Check Elevation	evation pivot bearings.		ОК	ОК		
7.	Check Azimuth t	bearing operation.		ОК	ОК		

		-	PROCEDURE / REPORT C	F TEST № 6.1		
TEST NAME: T-2 Antenna and Antenna Control System		ELEMENT	ELEMENT UNDER TEST: T-2 Antenna Subsystem		Serial № and/or version:	
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS
8.	Check: All visible hardware Cable harness Feed boom struts Feed pallet struts Ferrous metal surfaces Painting, cracks and rusting Waveguide connections and support brackets Antenna surface 			ОК	ОК ОК ОК ОК ОК ОК ОК	
9.	Apply recommended rust preventive re-coating on Ferrous parts and clean the dust and excessive oil			ОК	ок	
10.	 Apply De-icing system and blister check procedure. <i>Notes:</i> Only one SSPA (T-2) and one TWTA Beam (T-1) can be turned ON when antenna Anti-Icing is enabled. Only one ECU can be in operation when Antenna Anti-Icing is enabled. 			ОК	ок	
		ov Stow and log				
1.	DEPLOY the antenna and verify there are no fault messages present. Verify that the antenna elevation angle is 10 degrees.			ОК	ок	
2.	Activate STOW Mode and check antenna stowing. And Check and record antenna STOW command.			Elevation Stow command -77	Command:	

			PROCEDURE / REPORT (DF TEST № 6.1			
TEST NAME: T-2 Antenna and Antenna Control System		ELEMENT UNDER TEST: T-2 Antenna Subsystem		Subsystem	Serial Nº and/or version:		
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:	
STEP		TEST SEQUENCI	EXPECTED RESULT	RESULT	REMARKS		
3.	Check antenna is centred on AZ to 0 degree and fitting into the frame, Check AZ STOW Centre switch operation.			Check AZ centre Offset =0 Check Centre Switch	Offset=0.0 OK		
4.	Check antenna, slowing when antenna reaches 5-7cm to final stow position. If not, adjust the Velocity switch, located under the cover at the inner left- side of the elevation axle shaft.				ок		
5.	Check Antenna STOWED messages and actual STOW position			Elevation Stow actual value Stowed message	Actual Value: OK		
6.	DEPLOY the antenna again and check Manual ACU / Antenna JOG Commands.			ОК	ОК		
7.	Check Manual A	Z Hand Cranking		OK	ОК		
8.	Check Manual EL Hand Cranking		ОК	ОК			
	T-2 ACU Eme	rgency Stop Check					
1.	Verify the Emerg	gency Stop on T-2 ACU stops a	antenna movement.	OK	ОК		
2.	Verify ACU Eme	ergency Stop activation reports	to ASNMC	ОК	ОК		
3.	Verify resetting t	Verify resetting the ACU Emergency Stop restores antenna drive capability.		ОК	ок		
			PROCEDURE / REPOR	T OF TEST № 6.1			
---	--------------------------------------	-----------------	--------------------------	-----------------	--------------------------	-----------	--
TEST NAI and Antenr	ME: T-2 Antenna na Control System	ELEMEN	T UNDER TEST: T-2 Antenr	na Subsystem	Serial Nº and/or version	n:	
	-	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:	
STEP	TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
	T-2 Antenna T	ravel Limits					
This figure summarizes the azimuth and elevation angle settings for the T-2 antenna and can be used a reference for the procedures in this section.							

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	PROCEDURE / REPORT OF TEST Nº 6.1									
TEST NAM and Antenna	IE: T-2 Antenna a Control System	ELEMEN	T UNDER TEST: T-2 Antenna S	Subsystem	Serial Nº and/or version	:				
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
STEP		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS				
1.	Connect the PM	U Handheld Maintenance Unit	to the T-2 PDU.	ОК	ОК					
2.	Manually move the antenna to be positioned over the Container centre line and record the azimuth and elevation angles.			ОК	AZ: EL:					
3	 Calculate the approximate setting for the azimuth CW and CCW Pre-Limits. They are set at the factory to be approximately ±150 degrees from the centre line setting. CW limit = Centre line azimuth +150 degrees. CCW limit = Centre line azimuth -150 degrees. 			ОК	CW Pre-Limit: CCW Pre-Limit:					
4.	Drive the antenr that there are no	na CW to a valid point, record to a larms present in the ACU or	he azimuth angle and verify ASNMC.	ОК	AZ Angle: OK					
5.	Drive the antenr Record the azim reported on the	na in the CW direction. The Adult the soft limit, veri ACU and ASNMC.	CU will alarm at the soft limit. fy the soft limit alarm is	ОК	Soft CW Limit: OK					
6.	Continue driving the antenna in the CW direction. The antenna will stop near the Az CW Pre-Limit, calculated in step 3. Record the azimuth angle at the CW Pre-Limit and verify the Pre-Limit is reported on the ACU and ASNMC.			ОК	CW Pre-Limit: OK					
7.	Drive the antenr that there are no	Drive the antenna CCW to a valid point, record the azimuth angle and verify that there are no alarms present in the ACU or ASNMC.			AZ Angle: OK					
8.	Drive the antenr Record the azim reported on the	na in the CCW direction. The <i>i</i> nuth angle of the soft limit, veri ACU and ASNMC.	ACU will alarm at the soft limit. fy the soft limit alarm is	ОК	Soft CCW Limit: OK					

			PROCEDURE / REPORT C	F TEST № 6.1		
TEST NAI and Antenn	ME: T-2 Antenna na Control System	ELEMENT	UNDER TEST: T-2 Antenna S	Subsystem	Serial Nº and/or version	:
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCE	E	EXPECTED RESULT	RESULT	REMARKS
9.	 9. Continue driving the antenna in the CCW direction. The antenna will stop near the Az CCW Pre-Limit, calculated in step 3. Record the azimuth angle at the CCW Pre-Limit and verify the Pre-Limit is reported on the ACU and ASNMC. 			ОК	CCW Pre-Limit: OK	
10.	Drive the antenr	na in the CW direction back to th	ne centre.	ОК	ок	
11.	Drive the antenna UP to a valid point, record the elevation angle and verify that there are no alarms present in the ACU or ASNMC.			ОК	EL Angle: OK	
12.	Drive the antenna in the UP direction. The ACU will alarm at the soft limit. Record the elevation angle of the soft limit, verify the soft limit alarm is reported on the ACU and ASNMC.			ОК	Soft UP Limit: OK	
13.	Continue driving the UP Pre-Limi angle at the UP and ASNMC.	the antenna in the UP direction t, set at approximately 88 degre Pre-Limit and verify the Pre-Lin	n. The antenna will stop near ees. Record the elevation nit is reported on the ACU	ОК	UP Pre-Limit: OK	
14.	Drive the antenr angle and verify	na DOWN to a valid point off ce that there are no alarms prese	ntre, record the elevation nt in the ACU or ASNMC.	ОК	EL Angle: OK	
15.	Drive the antenna in the DOWN direction. The ACU will alarm at the soft limit. Record the elevation angle of the soft limit, verify the soft limit alarm is reported on the ACU and ASNMC.			ОК	Soft DN Limit: OK	
16.	Continue driving the antenna in the DOWN direction. The antenna will stop near DOWN Pre-Limit, set at approximately -2 degrees. Record the elevation angle at the DOWN Pre-Limit and verify the Pre-Limit is reported on the ACU and ASNMC.			ОК	DN Pre-Limit: OK	

	PROCEDURE / REPORT OF TEST Nº 6.1									
TEST NAM and Antenna	IE: T-2 Antenna a Control System	ELEMEN	T UNDER TEST: T-2 Antenna S	Subsystem	Serial Nº and/or version:					
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
STEP		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS				
	T-2 Antenna S	T-2 Antenna Safe-to-Transmit Limits								
1.	Point the antenna to clear sky and record the azimuth and elevation angles. This will be the antenna "set" position.			ОК	AZ: EL:					
2.	 Set up Modem and Spectrum Analyzer: Confirm all modems are OFF. At the L-Band Uplink Patch Panel, connect the output of EBEM #1 to T-2 antenna. Set EBEM #1 transmit to 1200 MHz CW at -20 dBm. Connect a Spectrum Analyzer on feed coupler DC1 directly or at the RF Monitor/Test Panel port 25 to view transmitted carrier at RF. 			ОК	ок ок ок ок					
3	Configure the T- "Combined Offlin	2 for normal operating conditioner mode and operating at 10 o	ons with the SSPAs in dB output back-off.	ОК	ок					
4.	At the T-2 ACU, set the safe-to-transmit angular limits to: • Azimuth CW: +5 degrees from antenna set position • Azimuth CCW: -5 degrees from antenna set position • Elevation Up: +5 degrees from antenna set position • Elevation Down: -5 degrees from antenna set position			ОК	ок					
5.	Drive the antenna in azimuth CW +3 degrees from the set position. Verify the SSPAs are not inhibited (mute).			ОК	ок					
6.	Drive the antenr set position). Ve and the ACU inc	na in azimuth CW another +3 c rify the SSPAs are inhibited (R dicates alarms).	legrees (-6 degrees from the RF mute On, no carrier at DC1	ОК	ок					

		-	PROCEDURE / REPORT O	F TEST № 6.1	_	
TEST NAM and Antenn	ME: T-2 Antenna a Control System	ELEMENT	UNDER TEST: T-2 Antenna S	Subsystem	Serial № and/or version:	
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCE	Ē	EXPECTED RESULT	RESULT	REMARKS
7.	Drive the azimut SSPAs transmit.	h CCW -6 degrees. Clear the A	CU alarm and verify the	ОК	ок	
8.	Drive the antenr inhibited.	na in azimuth CCW -3 degrees.	Verify the SSPAs are not	ОК	ок	
9.	Drive the antenr antenna set pos carrier at DC1 a	na in azimuth CCW another -3 c ition). Verify the SSPAs are inh nd the ACU indicates alarms).	degrees (-6 degrees from the ibited (RF mute On, no	ОК	ок	
10.	Drive the azimuth CW +6 degrees. Clear the ACU alarm and verify the SSPAs transmit.			ОК	ок	
11.	Drive the antenna elevation up +3 degrees. Verify the SSPAs are not inhibited.			ОК	ок	
12.	Drive the antenr antenna set pos carrier at DC1 a	na elevation up another +3 degr ition). Verify the SSPAs are inh nd the ACU indicates alarms).	rees (+6 degrees from the ibited (RF mute On, no	ОК	ок	
13.	Drive the antenr verify the SSPA	na elevation down -6 degrees. C s transmit.	Clear the ACU alarm and	ОК	ок	
14.	Drive the antenr inhibited.	na elevation down -3 degrees. \	/erify the SSPAs are not	ОК	ок	
15.	Drive the antenna elevation down another -3 degrees (-6 degrees from the antenna set position). Verify the SSPAs are inhibited (RF mute On, no carrier at DC1 and the ACU indicates alarms).			ОК	ок	
16.	Drive the antenna elevation up +6 degrees (back to the antenna set position). Clear the ACU alarm and verify the SSPAs transmit.			ОК	ОК	

	PROCEDURE / REPORT OF TEST Nº 6.1									
T an	EST NAN	IE: T-2 Antenna a Control System	ELEME	ENT UN	DER TEST: T-2 Antenna S	ubsystem	Serial № an	d/or versior	1:	
			TEST CONDUCTOR:		QA ENG:	CUSTOMER:	DATE S	TART:	DATE END:	
	STEP		TEST SEQUE	NCE		EXPECTED RESUL	T RES	RESULT F		
		T-2 Satellite A	cquisition							
	 Verify that all the required preconditions are met: GPS quality minimum of 8 Compass heading available Inclinometers feedback available (Tilt/Cross) Feedboom clamps released 				ОК	01 01 01 01	< < < <			
	2.	Check Satellite Preset list is configured for the 6 satellites as shown in the table below.			ellites as shown in the	ОК	0	ОК		
	Sate	ellite Name	Satellin Inclinati	te ion	Track mode	S/S Antenna pointed	Input signal level	Beacon Settings		
	GO۱	VSAT	0		optrack	ок		Offset -4	5/low sig thr -80 3w:4Khz	
	SKY	(5B	0		optrack	ОК		Offset -45/low sig thr -80 /Bw:4Khz		
	SKY 5C		0		optrack	ок		Offset -4 /E	5/low sig thr -80 3w:4Khz	
	SKY 5D		0		optrack	ок		Offset -45/low sig thr -80 /Bw:4Khz		
	SCRALL1B		0		optrack	ок		Offset -45/low sig thr -8 /Bw:4Khz		
	SYF	RACUSE3A	0		optrack	ОК		Offset -4 /B	5/low sig thr -80 w:280Khz	

6.2 T-1 Antenna and Antenna Control System

			PROCEDURE / REPORT O	F TEST № 6.2		
TEST NA	ME: T-1 Antenna na Control System	ELEMENT	UNDER TEST: T-1 Antenna S	Subsystem	Serial № and/or version:	
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
OTED						
SIEP					RESULI	KEMAKKS
	T-1 Antenna Maintenance			l		
1.	Check antenna m lubrication.	iotors/brakes and lubrication ar	nd perform cleaning and	OK	ок	
2.	Lubricate EL Drive Shaft and check motor operations for any abnormal noise.			ОК	ок	
3.	Lubricate AZ Drive Sector and check motor operations for any abnormal noise.			ОК	ок	
4.	Open, clean and	check AZ Brake and clutch sys	stem functioning properly.	ОК	ОК	
5.	Check antenna F	eed Membrane and Air leakago	е.	ОК	ОК	
	T-1 ACU Deplo	y, Stow and Jog				
1.	Check PDU for la	bel indicating that it has been r	ruggedized.	ОК	ОК	
2.	Check that anteni	na drives in slow speed until th	e velocity switch is released.	ОК	ОК	
3.	Check that antenr	na stops for the stow bracket to	o be lowered.	ОК	ОК	
4.	DEPLOY the antenna and verify there are no fault messages present. Verify that the antenna elevation angle is 22.5 degrees.		ОК	ок		
5.	Engage "HANDLE LATCH" Check in the Limit Switch Logic Box that the HANDLE LATCH LED is OFF when switch actuated			ОК	ок ок	

PROCEDURE / REPORT OF TEST Nº 6.2									
TEST NA and Antenr	ME: T-1 Antenna na Control System	ELEMENT	UNDER TEST: T-1 Antenna	Subsystem	Serial Nº and/or version:				
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP		TEST SEQUENCE			RESULT	REMARKS			
6.	DEPLOY Antenna Wings Check in the 'Limit Switch Logic Box that the L WING DEPLOYED LED is OFF when switch actuated Check in the Limit Switch Logic Box that the R WING DEPLOYED LED is OFF when switch actuated			ОК	ок ок ок				
7.	Activate STOW Mode and check antenna stowing and record antenna STOW command.			Elevation Stow command	Command:				
8.	Check antenna is centred on AZ properly to 0 degree and fitting into the frame, Check AZ STOW Centre switch operation. Check in the Limit Switch Logic Box that the AZ CENT LED is OFF when switch actuated			Check AZ centre Offset =0 Check Centre Switch	Offset= 0.0 OK				
9.	STOW Antenna Wings Check in the Limit Switch Logic Box that the L WING STOWED LED is OFF when switch actuated Check in the Limit Switch Logic Box that the R WING STOWED LED is OFF when switch actuated			ок	ок				
10.	Check antenna Stow Velocity switch activates and stops Antenna Elevation Drive and unit creates STOWED message. Check in the Limit Switch Logic Box that the EL VELOCITY LED is OFF when switch actuated			Check Antenna stops when velocity switch is actuated	ок ок				
11.	Check Antenna STOWED messages and actual STOW position Check in the Limit Switch Logic Box that the STOWED LED is OFF when switch actuated			Elevation Stow actual value Stowed message	Actual Value: OK				
12.	Activate Emerger	cy STOW mode with Wings ope	en	HW Bypass ON	ОК				

			PROCEDURE / REPORT C	0F TEST № 6.2				
TEST NA and Anten	ME: T-1 Antenna na Control System	ELEMENT U	INDER TEST: T-1 Antenna	Subsystem	Serial Nº and/or versior	Serial № and/or version:		
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
13.	DEPLOY the ante Commands.	enna again and check Manual A(CU / Antenna JOG	ОК	ок			
14.	Release the Azim Check in the Limi when switch actu Engage the Azim	nuth Brake and check Manual AZ t Switch Logic Box that the AZ H ated uth Brake.	Hand Cranking ANDCRANK LED is OFF	ОК	ок ок			
15.	Check Manual EL Hand Cranking Check in the Limit Switch Logic Box that the EL HANDCRANK LED is OFF when switch actuated			ОК	ок			
16.	Check Feed Asse	embly is in good condition.		ОК	ок			
	T-1 ACU Emerg	gency Stop Checks						
1.	Verify the Emerge	ency Stop on T-1 ACU stops ante	enna movement.	ОК	ОК			
2.	Verify ACU Emer	gency Stop activation reports to	ASNMC	ОК	ОК			
3.	Verify resetting th	e ACU Emergency Stop restores	s antenna drive capability.	ОК	ОК			
4.	Verify the Emerge	ency Stop on T-1 PDU stops ante	enna movement.	ОК	ОК			
5.	Verify PDU Emer	gency Stop activation reports to	ASNMC	ОК	ОК			
6.	Verify resetting th	e ACU Emergency Stop restores	antenna drive capability.	ОК	ОК			

	PROCEDURE / REPORT OF TEST Nº 6.2										
TEST NAI and Antenr	ME: T-1 Antenna na Control System	ELEMENT	UNDER TEST: T-1 Antenna	Subsystem	Serial Nº and/or versior	Serial Nº and/or version:					
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:					
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS					
	T-1 AC Safe-to	-Rotate Checks									
1.	Verify the Safe-to	-Rotate activation at T-1 trailer	stops antenna movement.	ОК	ОК						
2.	Verify Safe-to-Rotate activation reports to ASNMC			ОК	ОК						
3.	Verify resetting the Safe-to-Rotate restores antenna drive capability.			ОК	ОК						
	T-1 Antenna Tr	avel Limits									

	PROCEDURE / REPORT OF TEST № 6.2									
TEST NAM and Antenna	IE: T-1 Antenna a Control System	ELEMENT	ELEMENT UNDER TEST: T-1 Antenna Subsystem			Serial № and/or version:				
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS				
This figure s	ummarizes the azim	uth and elevation angle setting	s for the T-1 antenna and can Up Hardware Limit Up Hardware Limit Up Software Limit Deploy 22.5	to be used a reference for the	procedures in this section.					
1.	Connect the PMU	Handheld Maintenance Unit to	the T-1 PDU.		ОК					

	PROCEDURE / REPORT OF TEST Nº 6.2									
TEST NA and Antenr	ME: T-1 Antenna na Control System	ELEMENT UNDER TEST: T-1 Antenna Subsystem			Serial № and/or version:					
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS				
2.	Manually move the antenna to be positioned over the Container centre line and record the azimuth and elevation angles.				AZ: EL:					
3	 Calculate the approximate setting for the azimuth CW and CCW Pre-Limits. They are set at the factory to be approximately ±65 degrees from the centre line setting. CW limit = Centre line azimuth +65 degrees. CCW limit = Centre line azimuth -65 degrees. 				CW Pre-Limit: CCW Pre-Limit:					
4.	Record the azimuth angle and verify that there are no alarms present in the ACU or ASNMC.				AZ Angle: OK					
5.	Drive the antenna Record the azimu reported on the A	in the CW direction. The ACU th angle of the soft limit, verify CU and ASNMC.	J will alarm at the soft limit. the soft limit alarm is		Soft CW Limit: OK					
6.	Continue driving t the Az CW Pre-Li CW Pre-Limit and	he antenna in the CW direction mit, calculated in step 3. Recc I verify the Pre-Limit is reported	n. The antenna will stop near ord the azimuth angle at the d on the ACU and ASNMC.		CW Pre-Limit: OK					
7.	Confirm at the Lin	nit Switch Logic Box that the A	Z CW LED is OFF.		ок					
8.	Drive the antenna CCW to a valid point, record the azimuth angle and verify that there are no alarms present in the ACU or ASNMC and that the Limit Switch Logic Box that the AZ CW LED is ON.				AZ Angle: OK					
9.	Drive the antenna Record the azimu reported on the A	in the CCW direction. The A0 th angle of the soft limit, verify CU and ASNMC.	CU will alarm at the soft limit. the soft limit alarm is		Soft CCW Limit: OK					

PROCEDURE / REPORT OF TEST № 6.2									
TEST NA and Anten	ME: T-1 Antenna na Control System	ELEMENT	UNDER TEST: T-1 Antenna S	Subsystem	Serial Nº and/or version	:			
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS			
10.	 Continue driving the antenna in the CCW direction. The antenna will stop near the Az CCW Pre-Limit, calculated in step 3. Record the azimuth angle at the CCW Pre-Limit and verify the Pre-Limit is reported on the ACU and ASNMC. 			OK	CCW Pre-Limit: OK				
11.	Confirm at the Limit Switch Logic Box that the AZ CCW LED is OFF.			ОК	ок				
12.	Drive the antenna in the CW direction back to the centre and verify that there are no alarms present in the ACU or ASNMC and that the Limit Switch Logic Box AZ CCW LED is ON.			ОК	ок				
13.	Drive the antenna that there are no a Switch Logic Box	a UP to a valid point, record the alarms present in the ACU or A AZ CCW LED is ON.	elevation angle and verify SNMC and that the Limit	ОК	EL Angle: OK OK				
14.	Drive the antenna Record the elevat reported on the A	in the UP direction. The ACU tion angle of the soft limit, verify CU and ASNMC.	will alarm at the soft limit. the soft limit alarm is	ОК	Soft UP Limit: OK				
15.	Continue driving the antenna UP. The antenna will stop near the UP Pre- Limit, set at approximately 85 degrees. Record the elevation angle at the UP Pre-Limit and verify the Pre-Limit is reported on the ACU and ASNMC.			ОК	UP Pre-Limit: OK				
16.	Confirm at the Limit Switch Logic Box that the EL UP and EL UP-BACKUP LEDs are OFF.			ОК	ОК ОК				
17.	Drive the antenna DOWN to a valid point, record the elevation angle and verify that there are no alarms present in the ACU or ASNMC and that the Limit Switch Logic Box that the EL UP and EL UP-BACKUP LEDs are OFF.			OK	EL Angle: OK OK				

			PROCEDURE / REPORT C	F TEST № 6.2		
TEST NA and Anten	ME: T-1 Antenna na Control System	ELEMENT U	JNDER TEST: T-1 Antenna	Subsystem	Serial Nº and/or version	:
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS
18.	Drive the antenna DOWN. The ACU will alarm at the soft limit. Record the elevation angle of the soft limit, verify the soft limit alarm is reported on the ACU and ASNMC.			ОК	Soft DN Limit: OK	
19.	Continue driving the antenna DOWN. The antenna will stop near DOWN Pre-Limit, set at approximately 0 degrees. Record the elevation angle at the DOWN Pre-Limit and verify the Pre-Limit is reported on the ACU and ASNMC.			ОК	DN Pre-Limit: OK	
	T-1 Antenna Sa	afe-to-Transmit Limits				
1.	Point the antenna This will be the ar	to clear sky and record the azin ntenna "set" position.	nuth and elevation angles.	ОК	AZ: EL:	
2.	 Set up Modem and Spectrum Analyzer: Confirm all modems are OFF. At the L-Band Uplink Patch Panel, connect the output of EBEM #1 to T-1 antenna. Set EBEM #1 transmit to 1200 MHz CW at -20 dBm. Connect a Spectrum Analyzer on feed coupler DC1 directly or at the RF Monitor/Test Panel port 1 to view transmitted carrier at RF. 			ОК	ок ок ок ок	
3	Configure the T-1 "Combined Offline	for normal operating conditions e" mode and operating at 10 dB	with the TWTAs in output back-off.	ОК		

PROCEDURE / REPORT OF TEST Nº 6.2									
TEST NAI and Antenr	ME: T-1 Antenna na Control System	ELEMENT	UNDER TEST: T-1 Antenna S	Subsystem	Serial Nº and/or version	::			
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS			
4.	At the T-1 ACU, set the safe-to-transmit angular limits to: • Azimuth CW: +5 degrees from antenna set position • Azimuth CCW: -5 degrees from antenna set position • Elevation Up: +5 degrees from antenna set position • Elevation Down: -5 degrees from antenna set position			ОК	ок				
5.	Drive the antenna in azimuth CW +3 degrees from the set position. Verify the TWTAs are not inhibited (mute).			ОК	ок				
6.	Drive the antenna in azimuth CW another +3 degrees (-6 degrees from the set position). Verify the TWTAs are inhibited (RF mute On, no carrier at DC1 and the ACU indicates alarms).			ОК	ок				
7.	Drive the azimuth TWTAs transmit.	CCW -6 degrees. Clear the AC	CU alarm and verify the	ОК	ок				
8.	Drive the antenna inhibited.	in azimuth CCW -3 degrees. V	erify the TWTAs are not	ОК	ок				
9.	Drive the antenna in azimuth CCW another -3 degrees (-6 degrees from the antenna set position). Verify the TWTAs are inhibited (RF mute On, no carrier at DC1 and the ACU indicates alarms).			ОК	ок				
10.	Drive the azimuth CW +6 degrees. Clear the ACU alarm and verify the TWTAs transmit.			ОК	ок				
11.	Drive the antenna elevation up +3 degrees. Verify the TWTAs are not inhibited.			ОК	ок				
12.	Drive the antenna antenna set positi carrier at DC1 and	elevation up another +3 degre ion). Verify the TWTAs are inhib d the ACU indicates alarms).	es (+6 degrees from the bited (RF mute On, no	ОК	ок				

			PROCEDURE / REPORT C	F TEST № 6.2			
TEST NA and Anten	ME: T-1 Antenna na Control System	ELEMENT	JNDER TEST: T-1 Antenna	Subsystem	Serial № and/or version:		
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:	
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS	
13.	Drive the antenna elevation down -6 degrees. Clear the ACU alarm and verify the TWTAs transmit.			ОК	ок		
14.	Drive the antenna elevation down -3 degrees. Verify the TWTAs are not inhibited.			ОК	ок		
15.	Drive the antenna elevation down another -3 degrees (-6 degrees from the antenna set position). Verify the TWTAs are inhibited (RF mute On, no carrier at DC1 and the ACU indicates alarms).			ОК	ок		
16.	Drive the antenna position). Clear th	a elevation up +6 degrees (back he ACU alarm and verify the TW	to the antenna set TAs transmit.	ОК	ок		
	T-1 Satellite Ac	equisition					
1.	 Verify that all the required preconditions are met: GPS quality minimum of 8 Compass heading available Inclinometers feedback available (Tilt/Cross) Feedboom clamps released 			ОК	ОК ОК ОК ОК		
2.	Check Satellite Pr table below.	reset list is configured for the 6 s	atellites as shown in the	ОК	ок		

	PROCEDURE / REPORT OF TEST Nº 6.2									
TEST NAM	IE: T-1 Antenna a Control System	ELEME	1 Antenna Subsystem Serial Nº and/or version:				:			
		TEST CONDUCTOR:	QA ENG:	CUSTO	CUSTOMER:		START:	DATE END:		
STEP	STEP TEST SEQUENCE			EXPECTE	D RESULT RE		SULT	REMARKS		
Sate	Satellite Name		Track mode	S/S Antenna pointed	Input signal level		Observations			
GOV	/SAT	0	optrack	ок	Offset -45/low s /Bw:4Kh		5/low sig thr -80 sw:4Khz			
SKY	5B	0	optrack	ок			Offset -45/low sig thr -80 /Bw:4Khz			
SKY	5C	0	optrack	N/R			Offset -45/low sig thr -80 /Bw:4Khz			
SKY	5D	0	optrack	ок			Offset -45 /B	5/low sig thr -80 sw:4Khz		
SCR	SCRALL1B		optrack	N/R			Offset -45 /B	5/low sig thr -80 sw:4Khz		
SYR	SYRACUSE3A		optrack	N/R			Offset -45/low sig thr -80 /Bw:280Khz			

7 MEASUREMENTS AND CALIBRATIONS

7.1 TX RF Output Frequency Accuracy

	PROCEDURE / REPORT OF TEST № 7.1									
TEST NAM Freque	ME: Tx RF Output ency Accuracy	ELEMENT	UNDER TEST: Transmission	Subsystem	Serial Nº and/or versior	1:				
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
STEP	STEP TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS				
	T-1 BUC Output Frequency Accuracy									
1.	Switch T-1 BUC A Off-line.			ОК	ОК					
2.	Inject a -20 dBm, 1200 MHz CW signal into Uplink Patch Panel where U-link connects EBEM #1 to Combiner B.			ОК	ок					
3.	Connect the Frequency Counter to the T-1 BUC OFF-LINE OUT port 5 of the RF Monitor/Test Panel.			ОК	ок					
4.	Measure and reco	ord the T-1 BUC A output frequ	iency.	8.15*10 ⁹ ± 100 Hz	Hz					
5.	Remove the Extern Measure the T-1 B achieve 8,150,000	rnal Reference Input from T-1 BUC A output frequency and a 0,000 ± 100 Hz. Record the fre	BUC A. djust the BUC oscillator to equency.	8.15*10 ⁹ ± 100 Hz	Hz					
6.	Reconnect the Ex	ternal Reference input to BUC	; А.	ОК	ОК					
7.	Switch T-1 BUC B Off-line. Measure and record the T-1 BUC B output frequency.			8.15*10 ⁹ ± 100 Hz	Hz					
8.	Remove the External Reference Input from T-1 BUC B. Measure the T-1 BUC B output frequency and adjust the BUC oscillator to achieve $8,150,000,000 \pm 100$ Hz. Record the frequency.			8.15*10 ⁹ ± 100 Hz	Hz					
9.	Reconnect the Ex	tternal Reference input to BUC	: В.	ОК	ОК					

			PROCEDURE / REPORT C	9F TEST № 7.1		
TEST NAM Freque	IE: Tx RF Output ncy Accuracy	ELEMENT U	JNDER TEST: Transmission	Subsystem	Serial Nº and/or versio	n:
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS
	T-2 BUC Output Frequency Accuracy					
1.	Switch T-2 BUC A Off-line.			ОК	ОК	
2.	Inject a -20 dBm, 1200 MHz CW signal into Uplink Patch Panel where U-link connects EBEM #1 to Combiner A.			ОК	ок	
3.	Connect the Frequency Counter to the T-2 BUC OFF-LINE OUT port 23 of the RF Monitor/Test Panel.			ок	ок	
4.	Measure and reco	ord the T-2 BUC A output freque	ncy.	8.15*10 ⁹ ± 100 Hz	Hz	
5.	Remove the Extern Measure the T-2 I achieve 8,150,000	rnal Reference Input from T-2 Bl BUC A output frequency and adj 0,000 ± 100 Hz. Record the freq	UC A. ust the BUC oscillator to uency.	8.15*10 ⁹ ± 100 Hz	Hz	
6.	Reconnect the Ex	ternal Reference input to BUC A	٨.	ОК	ОК	
7.	Switch T-2 BUC E frequency.	3 Off-line. Measure and record th	ne T-2 BUC B output	8.15*10 ⁹ ± 100 Hz	Hz	
8.	Remove the External Reference Input from T-2 BUC B. Measure the T-2 BUC B output frequency and adjust the BUC oscillator to achieve 8,150,000,000 ± 100 Hz. Record the frequency.			8.15*10 ⁹ ± 100 Hz	Hz	
9.	Reconnect the Ex	tternal Reference input to BUC E	3.	ОК	ОК	
10.	Remove the Signa Link to the L-Band	al Generator and Frequency Cou d Uplink Patch Panel.	unter and restore the U-	ОК	ок	

7.2 RX L-Band Output Frequency Accuracy

			PROCEDURE / REPORT C	F TEST № 7.2		
TEST NA Outp	ME: Rx L-Band out accuracy	ELEME	NT UNDER TEST: Receive S	ubsystem	Serial Nº and/or version	:
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS
1.	Verify the Signal Generator and the Frequency Counter are locked to the 10 MHz TFRS Distribution.			ОК	ок	
	T-1 BDC Output Frequency Accuracy					
1.	Inject a -15 dBm, 7500 MHz CW signal to the T-1 BDC IN port 10 of the RF Monitor/Test Panel.			ОК	ок	
2.	Connect the Frequency Counter to Downlink Patch Panel where U-link connects EBEM #1 to Divider B.			ОК	ок	
3.	Switch BDC A on	-line. Measure and record the	Γ-1 BDC A output frequency.	1200 MHz ± 100 Hz	Hz	
4.	Remove the Exte Measure the T-1 achieve 1,200,000	rnal Reference Input from T-1 I BDC A output frequency and a 0,000 ± 100 Hz. Record the fre	BDC A. djust the BDC oscillator to quency.	1200 MHz ± 100 Hz	Hz	
5.	Reconnect the Ex	ternal Reference input to BDC	Α.	ОК	ОК	
6.	Switch T-2 BDC E frequency.	3 on-line. Measure and record t	the T-1 BDC B output	1200 MHz ± 100 Hz	Hz	
7.	Remove the External Reference Input from T-1 BDC B. Measure the T-1 BDC B output frequency and adjust the BDC oscillator to achieve 1,200,000,000 \pm 100 Hz. Record the frequency.			1200 MHz ± 100 Hz	Hz	
8.	Reconnect the Ex	tternal Reference input to BDC	В.	ОК	ОК	

	PROCEDURE / REPORT OF TEST № 7.2									
TEST NA Outp	ME: Rx L-Band	ELEME	NT UNDER TEST: Receive S	ubsystem	Serial Nº and/or versior	1:				
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS				
	T-2 BDC Outpu	It Frequency Accuracy								
1.	Inject a -15 dBm, 7500 MHz CW signal to the T-1 BDC IN port 10 of the RF Monitor/Test Panel.			ОК	ок					
2.	Connect the Frequency Counter to Downlink Patch Panel where U-link connects EBEM #1 to Divider A.			ОК	ок					
3.	Switch BDC A on-line. Measure and record the T-1 BDC A output frequency.			1200 MHz ± 100 Hz	Hz					
4.	Remove the Exte Measure the T-1 achieve 1,200,00	rnal Reference Input from T-1 BDC A output frequency and a 0,000 ± 100 Hz. Record the fre	BDC A. djust the BDC oscillator to quency.	1200 MHz ± 100 Hz	Hz					
5.	Reconnect the Ex	ternal Reference input to BDC	A.	ОК	ОК					
6.	Switch T-2 BDC E frequency.	3 on-line. Measure and record	the T-1 BDC B output	1200 MHz ± 100 Hz	Hz					
7.	Remove the External Reference Input from T-1 BDC B. Measure the T-1 BDC B output frequency and adjust the BDC oscillator to achieve $1,200,000,000 \pm 100$ Hz. Record the frequency.			1200 MHz ± 100 Hz	Hz					
8.	Reconnect the Ex	ternal Reference input to BDC	В.	ОК	ОК					
9.	Remove the Sign Link to the L-Band	al Generator and Frequency C d Uplink Patch Panel.	ounter and restore the U-	ОК	ОК					

7.3 TX Levels and Phase Alignment

7.3.1 <u>T-2 TX Levels and Phase Alignment</u>

The procedures in this section are summarized in the T-2 Transmit System figure below.



Level 3A Maintenance Procedures at FSP, DSO TSGT – 11137-01610-031 Revision 1

		I	PROCEDURE / REPORT O	F TEST № 7.3.1		
TEST NAM	E: T-2 Tx Levels	ELEME	NT UNDER TEST: TX Subs	ystem	Serial Nº and/or versior	1:
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS
1.	Point Antenna to	cold sky.		ОК	ок	
2.	Set BUC A to 23.8 dB gain.1. Inject a 1200 MHz CW at -29.9 dB into BUC A RF In2. Adjust BUC A gain to -5.7 dBm at 8150 MHz RF Out			ОК	ок	
3.	Match BUC B to BUC A 1. Inject L-Band at J75 of Uplink L-Band Patch Panel (1200 MHz, -21 dBm). 2. Measure at RF Monitor/Test Panel Test Point 22 (T-2 On-line BUC Out). 3. Switch BUC B on-line. 4. Adjust BUC B gain to match level of BUC A at RF Monitor/Test Panel Test Point 22			ОК	ок	
4.	Set the T-2 Slope below:	e Equalizer to -0.6 dB and 19.0 dl	3 and confirm in the table	ОК	ок	
5.	Remove T-2 PIM	Shield.		OK	ОК	
6.	Inject -10 dBm, 1 1 for T-2 transmit	200 MHz at cable W212 (EBEM coperations.	1 Tx, J6) and patch EBEM	ОК	ок	
7.	Monitor input to SSPA A with a Spectrum Analyzer. Ensure that the cable loss is accounted for at 8150 MHz.			ОК	ок	
8.	Switch to BUC A.			ОК	ОК	
9.	Adjust Slope Equ Record attenuato below.	alizer attenuator to achieve -19 c or setting in the SSPA and Slope	IBm at SSPA A input. Equalizer Settings table	ОК	ок	

	PROCEDURE / REPORT OF TEST Nº 7.3.1									
TEST NAMI and Phase A	E: T-2 Tx Levels	ELEM	IENT UNDER TES	T: TX Subs	system		Serial Nº a	nd/or versior	ו:	
		TEST CONDUCTOR:	QA ENG	:	CUS	STOMER:	DATE	START:	DATE END:	
STEP		TEST SEQUENCE			EXPEC	FED RESULT	RES	SULT	REMARKS	
Note: This ta	able will be filled in du	ring the remainder of this pro	ocedure with SSPA	and Slope	Attenuator se	ettings.				
			2.4m Tx Leve	ls SSPA Ir	put Settings	5				
		Step (BUC)	Slope Setting	Attenuat	or Setting	SSPA Input Le	vel			
		9 (BUC A)	-0.6		(dB)	19.0 dB	(Check)			
		11 (BUC B)	-0.6		(dB)	19.0 dB	(Check)			
2.4m Tx Levels SSPA Attenuator Linear Setting										
Step (SSPA) Slope Setti		Slope Setting	Attenuator Setting SSPA Attenuate		or					
		20 (SSPA A)	-0.6		(dB)(dB)					
		24 (SSPA B)	-0.6		(dB)	(dB)				
		32 (Combined SSPA)	-0.6		(dB)	51.3 dBm	(Check)			
10.	Switch to BUC B.					ОК	C	Ж		
11.	Adjust Slope equaliz Record attenuator s	zer attenuator to achieve -19 setting in the SSPA and Slop	dBm at SSPA A ir e Equalizer Setting	nput. Is table.		ОК	c	Ж		
12.	Switch to BUC A.					ОК	C	Ж		
13.	Set Slope equalizer	attenuator to figure recorded	d in step 9.			ОК	C	Ж		
14.	Remove the Spectre	um Analyzer and normalise t	he input to SSPA A	۹.		ОК	C	Ж		
15.	Ensure the SSPAs a	Ensure the SSPAs are set to Combine Off-Line.				OK	0	ок		
16.	Monitor DC1 with a Power Meter. Ensure that the coupling factor is accounted for at 8150 MHz					ОК	C	Ж		
17.	Apply power to both 10 dB.	SSPAs and set both SSPA	A and B attenuator	rs to		ОК	C	Ж		

PROCEDURE / REPORT OF TEST № 7.3.1									
TEST NAM and Phase A	E: T-2 Tx Levels Alignment	ELEM	ENT UNDER TEST: TX Subs	system	Serial № and/or versior	1:			
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS			
18.	Set SSPA A to M	aintenance.		ОК	ОК				
19.	Command SSPA A to transmit and allow it to warm until the temperature settles out.			ОК	ок				
20	Adjust SSPA A's attenuator to achieve 51.3 dBm at DC1 and record the attenuator setting in the SSPA and Slope Equalizer Settings table.			ОК	ок				
21.	Command SSPA A to Standby.			ОК	ОК				
22.	Set SSPA B to Maintenance.			ОК	ОК				
23.	Command SSPA B to transmit and allow it to warm until the temperature settles out.			ОК	ок				
24.	Adjust SSPA B's attenuator to achieve 51.3 dBm at DC1 and record the attenuator setting in the SSPA and Slope Equalizer Settings table.			ОК	ок				
25.	Command SSPA	B to Standby.		ОК	ОК				
26.	Set SSPAs to Co	mbine Off-Line.		ОК	ОК				
27.	Set the Slope equ step 9.	ualizer attenuator to 3 dB lower	that the figure recorded in	ОК	ок				
28.	Monitor DC 2 with accounted for at 8	n a Spectrum Analyzer. Ensure 8150 MHz.	that the cable loss is	ОК	ок				
29.	Command both S	SPAs to transmit.		ОК	ОК				
30.	While monitoring DC2 via the Spectrum Analyzer optimize the Phase Shifter for minimum reflected level at DC2.		ОК	ОК					
31.	Remove the Spec	ctrum Analyzer from DC2.		ОК	ОК				
32.	Using the Power achieve 51.3 dBn Slope Equalizer S	Meter at DC1 adjust the Slope I n at DC1 and record the attenua Settings table.	Equalizer attenuator to ator setting in the SSPA and	ОК	ок				

PROCEDURE / REPORT OF TEST Nº 7.3.1								
TEST NAMI and Phase A	E: T-2 Tx Levels Alignment	ELEI	ELEMENT UNDER TEST: TX Subsystem		Serial Nº and/or version:			
		TEST CONDUCTOR:	QA ENG:	DATE START:	DATE END:			
STEP	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS		
33.	Set Backup Slope Equalizer to -0.6 and 19.0 dB. OK OK							

7.3.2 <u>T-1 TX Levels and Phase Alignment</u>

The procedures in this section are summarized in the T-1 Transmit System figure below.



5. Adjust Slope Equalizer attenuator to achieve +45.0 dBm output at TWTA output for all TWTA/BUC combinations.

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			PROCEDURE / REPORT O	F TEST № 7.3.2		
TEST NAM and Phase A	TEST NAME: T-1 Tx Levels and Phase Alignment ELEMENT UNDER TEST: TX Subs		system	Serial Nº and/or versio	nd/or version:	
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCI		EXPECTED RESULT	RESULT	REMARKS
1.	Point Antenna to	cold sky.		OK	ОК	
2.	Set BUC A to 23. 1. Inject a 2. Adjust B	<u>8 dB gain.</u> 1200 MHz CW at -29.9 dB into 3UC A gain to -5.7 dBm at 815	o BUC A RF In 0 MHz RF Out.	ОК	ок	
3.	 Match BUC B to BUC A Inject L-Band at J79 Uplink L-Band Patch Panel (1200 MHz, -21 dBm). Measure at RF Monitor/Test Panel Test Point 4 (T-1 On-line BUC Out). Switch BUC B on-line. Adjust BUC B gain to match level of BUC A RF Monitor/Test Panel Test Pan			ОК	ок	
4.	Set the T-1 Slope	e Equalizer to -0.6 dB and 19.0) dB.	ОК	ОК	
5.	Remove T-1 wea	ther cover.		OK	ОК	
6.	Inject -10 dBm, 1200 MHz at cable W212 (EBEM 1 Tx, J6) and patch EBEM 1 for T-1 transmit operations.			ОК	ок	
7.	Monitor input to TWTA A with a Spectrum Analyzer. Ensure that the cable loss is accounted for at 8150 MHz.		ОК	ОК		
8.	Switch to BUC A.			OK	ОК	
9.	Adjust Slope Equ Record attenuato below.	alizer attenuator to achieve -1 or setting in the TWTA and Slo	9 dBm at TWTA A input. pe Equalizer Settings table	ОК	ок	

			PROCEDURE / P	REPORT O	F TEST № 7	.3.2			
TEST NAME and Phase A	E: T-1 Tx Levels lignment	ELEN	IENT UNDER TES	T: TX Sub	system		Serial Nº	and/or versio	n:
		TEST CONDUCTOR:	QA ENG	:	CU	STOMER:	DATE	START:	DATE END:
STEP		TEST SEQUENCE			EXPEC	TED RESULT	RE	SULT	REMARKS
Note: This ta	ble will be filled in dur	ring the remainder of this pro	cedure with TWTA	and Slope	Attenuator s	ettings.	·	_	
			4.6m Tx Leve	ls TWTA Ir	put Settings	5			
		Step (BUC)	Slope Setting	Attenuat	or Setting	TWTA Input Le	vel		
		9 (BUC A)	-0.6		(dB)	19.0 dB	(Check)		
		11 (BUC B)	-0.6		(dB)	19.0 dB	(Check)		
		4.	6m Tx Levels TW	TA Attenu	ator Linear S	Setting			
		Step (TWTA)	Slope Setting	Attenuator Setting TWTA Attenua		TWTA Attenuat	or		
		20 (TWTA A)	-0.6		(dB)	(dB)			
		24 (TWTA B)	-0.6	(dB)		(dB)			
		32 (Combined TWTA)	-0.6		(dB)	45.0 dBm	_ (Check)		
10.	Switch to BUC B.					ОК		ок	
11.	Adjust Slope equaliz Record attenuator s	zer attenuator to achieve -19 etting in the TWTA and Slop	dBm at TWTA A in e Equalizer Setting	nput. js table.		ОК		ок	
12.	Switch to BUC A.					OK		ок	
13.	Set Slope equalizer	attenuator to figure recorded	d in step 9.			ОК		ок	
14.	Remove the Spectru	the Spectrum Analyzer and normalise the input to TWTA A.				ОК	(ОК	
15.	Ensure the TWTAs	TWTAs are set to Combine Off-Line.				ОК		ОК	
16.	Monitor DC1 with a Power Meter. Ensure that the coupling factor is accounted for at 8150 MHz				ОК		ок		
17.	Apply power to both 15 dB.	TWTAs and set both TWTA	A and B attenuato	ors to		ОК		ок	

			PROCEDURE / REPORT O	F TEST № 7.3.2		
TEST NAM and Phase A	E: T-1 Tx Levels Alignment	ELEN	IENT UNDER TEST: TX Subs	system	Serial Nº and/or versio	n:
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS
18.	Set TWTA A to M	laintenance.		ОК	ОК	
19.	Command TWTA settles out.	A to transmit and allow it to wa	arm until the temperature	ОК	ок	
20	Adjust TWTA A's attenuator setting	attenuator to achieve 45.0 dBr i in the TWTA and Slope Equal	n at DC1 and record the izer Settings table.	ОК	ОК	
21.	Command TWTA	A to Standby.		ОК	ОК	
22.	Set TWTA B to M	laintenance.		ОК	ОК	
23.	Command TWTA B to transmit and allow it to warm until the temperature settles out.			ОК	ОК	
24.	Adjust TWTA B's attenuator setting	attenuator to achieve 45.0 dBr in the TWTA and Slope Equal	n at DC1 and record the izer Settings table.	ОК	ОК	
25.	Command TWTA	B to Standby.		ОК	ОК	
26.	Set TWTAs to Co	ombine Off-Line.		ОК	ОК	
27.	Set the Slope equ step 9.	ualizer attenuator to 3 dB lower	that the figure recorded in	ОК	ОК	
28.	Monitor DC 2 with accounted for at 8	n a Spectrum Analyzer. Ensure 8150 MHz.	that the cable loss is	ОК	ОК	
29.	Command both T	WTAs to transmit.		ОК	ОК	
30.	While monitoring DC2 via the Spectrum Analyzer optimize the Phase Shifter for minimum reflected level at DC2.		ОК	ОК		
31.	Remove the Spec	ctrum Analyzer from DC2.		OK	ОК	
32.	Using the Power achieve 45.0 dBn Slope Equalizer S	Meter at DC1 adjust the Slope n at DC1 and record the attenu Settings table.	Equalizer attenuator to ator setting in the TWTA and	ОК	ок	

7.3.3 <u>T-2 Amplitude Response and Slope Equalizer Adjustment</u>

			PROCEDURE / REPORT OF	TEST № 7.3.3		
TEST NAM Response Equalizer A	TEST NAME: T-2 AmplitudeResponseandSlopeELEMENT UNDER TEST: TX SubsyEqualizer Alignment		/stem	Serial Nº and/or version	:	
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS
1.	Configure and ca MHz ± 250 MHz, MHz and measur	librate Network Analyzer for -10 measuring an upconverted freq ements of 502 points, 0.996 MH	dBm input of a swept 1200 uency of 8150 MHz ± 250 Iz.	ОК	ок	
2.	 Adjust Network Analyzer settings to: Averaging = 10 Smoothing = 2 IF BW = 30K Scale Per Div = 1 Coupler Factor Offset 			ОК	ок	
3.	Ensure the SSPA	as are set to Combine Off-Line.		ОК	ОК	
4.	Apply power to be	oth SSPAs and ensure both are	commanded to Standby.	ОК	ОК	
5.	Set the Slope Equivalues in the table	ualizer slope and attenuator to t e on page 48.	he "Combined SSPA"	ОК	ок	
6.	Confirm that the S	SSPA attenuators are set as per	table on page 48.	OK	ОК	
7.	Connect the Netw Panel and patch	vork Analyzer port 1 inject J47 c EBEM 1 for T-2 transmit operati	f the Uplink L-Band Patch ons.	ОК	ок	
8.	Connect the Network Analyzer port 2 receive cable to T-2 DC1.		OK	ОК		
9.	Switch to BUC A.			OK	ОК	
10.	Command the SSPAs to transmit and allow them to warm until the temperature settles out.			ОК	ок	
11.	On the Network A and 8400 MHz).	Analyzer, activate markers, low-	mid-high band. (7900, 8150	ОК	ок	

	PROCEDURE / REPORT OF TEST Nº 7.3.3								
TEST NAME: T-2 Amplitude Response and Slope Equalizer Alignment					Subsystem		Serial №	and/or versior	1:
		TEST CONDUCTOR:	QA	A ENG:		CUSTOMER:	DATE	E START:	DATE END:
STEP		TEST SEQUE	NCE		EX	PECTED RESULT	r Ri	ESULT	REMARKS
12.	Record the meas	ured level for the mid-band	I marker.			dBm			
13.	Record the initial slope (dB p-p) as determined by the difference in level measured at 7900 MHz and 8400 MHz in table below for BUC A / Comb. SSPAs.					ОК		ок	
	T-2 Amplitude Response and Slope Equalizer Alignment								
		Slope Equalizer	Initial Slope (dB)	On-Line BUC	On-Line SSPA	Slope Preset (dB)	Attenuation (dB)		
		2.4m		Α	A+B				
		2.4m		В	A+B				
		2.4m		A	A]	
		2.4m		В	В				
		2.4m		А	В				
		2.4m		В	A				
		Back Up		Α	A+B	-0.6	19.0		
		Back Up		В	A+B	-0.6	19.0		
		Back Up		A	A	-0.6	19.0		
		Back Up		В	В	-0.6	19.0		
		Back Up		A	В	-0.6	19.0		

PROCEDURE / REPORT OF TEST № 7.3.3							
TEST NAME: T-2 Amplitude Response and Slope ELEMENT UNDER TEST: TX Sub Equalizer Alignment Element under test: TX Sub		MENT UNDER TEST: TX Subs	system	Serial № and/or versior			
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:	
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS	
14.	 Slope Equalizer Setting Determine the optimum slope equalization to compensate for the slope. Adjust the slope value for optimum path slope compensation. Adjust the Slope Equalizer attenuator setting to achieve the recorded mid-band level in step 12. Record the final BUC A / Comb. SSPAs Slope Equalizer settings in table above. Caution: The slope and gain settings of the equalizer are interactive. Changing slope compensation will change gain. The output level of the SSPA must be carefully monitored while adjusting the slope equalizer. 		Max P-P variation is 2 dB (+/- 1 dB).	ок			
15.	Capture the Netw	ork Analyzer Trace and paste	it below.	ОК	ОК		
		Paste	BUC A / COMB SSPA Amplitu	ude Response JPG here.			
16.	Switch to BUC B.			ОК	ОК		
17.	Set the Slope Equalizer slope and attenuator to the "Combined SSPA" values in the table on page 48.		ОК	ок			
18.	Record the meas	ured level for the mid-band ma	arker.	dBm			
19.	Record the initial measured at 7900 SSPAs.	slope (dB p-p) as determined 0 MHz and 8400 MHz in the ta	by the difference in level ble above for BUC B / Comb.	ОК	ок		

PROCEDURE / REPORT OF TEST Nº 7.3.3							
TEST NAME: T-2 Amplitude Response and Slope Equalizer Alignment Element Under TEST: TX Sub		system Serial Nº and/or version:		:			
	TEST CONDUCTOR: QA ENG:			CUSTOMER:	DATE START:	DATE END:	
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS	
20.	Slope Equalizer Setting 1. Determine the optimum slope equalization to compensate for the slope. 2. Adjust the slope value for optimum path slope compensation. 3. Adjust the Slope Equalizer attenuator setting to achieve the recorded mid-band level in step 18. 4. Record the final BUC B / Comb. SSPAs Slope Equalizer settings in table above.			Max P-P variation is 2 dB (+/- 1 dB).	ок		
21.	Capture the Netw	vork Analyzer Trace and paste	it below.	ОК	ОК		
		Paste	BUC B / COMB SSPA Amplitu	ude Response JPG here.			
22.	Switch to SSPAs	to SSPA A Maintenance mod	le.	ОК	ОК		
23.	Set the Slope Equalizer slope and attenuator to the "SSPA A" values in the table on page 48.		ОК	ок			
24.	Record the measured level for the mid-band marker.		dBm				
25.	Record the initial slope (dB p-p) as determined by the difference in level measured at 7900 MHz and 8400 MHz in the table above for BUC B / SSPA A.			ОК	ок		

	PROCEDURE / REPORT OF TEST № 7.3.3								
TEST NAM Response Equalizer Ali	TEST NAME: T-2 Amplitude Response and Slope Equalizer Alignment ELEMENT UNDER TEST: TX Substruction			system	Serial Nº and/or version	:			
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP		TEST SEQUENCE	-	EXPECTED RESULT	RESULT	REMARKS			
26.	Slope Equalizer S 1. Determin slope. 2. Adjust th 3. Adjust th recorder 4. Record to above.	 <u>Slope Equalizer Setting</u> Determine the optimum slope equalization to compensate for the slope. Adjust the slope value for optimum path slope compensation. Adjust the Slope Equalizer attenuator setting to achieve the recorded mid-band level in step 24. Record the final BUC B / SSPA A Slope Equalizer settings in table above. 			ок				
27.	Capture the Netw	ork Analyzer Trace and paste	it below.	ОК	ОК				
		Pas	ste BUC B / SSPA A Amplitude	e Response JPG here.					
28.	Switch to BUC A.			ОК	ок				
29.	Set the Slope Equalizer slope and attenuator to the "SSPA A" values in the table on page 48.		ОК	ок					
30.	Record the measured level for the mid-band marker.			dBm					
31.	Record the initial measured at 790	slope (dB p-p) as determined 0 MHz and 8400 MHz in the ta	by the difference in level above for BUC A / SSPA	ОК	ок				

	PROCEDURE / REPORT OF TEST № 7.3.3								
TEST NAM Response Equalizer Ali	TEST NAME: T-2 Amplitude Response and Slope Equalizer Alignment			system	Serial № and/or version	:			
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP		TEST SEQUENCI	Ē	EXPECTED RESULT	RESULT	REMARKS			
32.	 <u>Slope Equalizer Setting</u> Determine the optimum slope equalization to compensate for the slope. Adjust the slope value for optimum path slope compensation. Adjust the Slope Equalizer attenuator setting to achieve the recorded mid-band level in step 30. Record the final BUC A / SSPA A Slope Equalizer settings in table above. 			Max P-P variation is 2 dB (+/- 1 dB).					
33.	Capture the Netw	ork Analyzer Trace and paste	it below.						
		Pa	ste BUC A / SSPA A Amplitude	e Response JPG here.					
34.	Switch to SSPAs	to SSPA B Maintenance mod	de.	ОК	ок				
35.	Set the Slope Equalizer slope and attenuator to the "SSPA B" values in the table on page 48.		ОК	ок					
36.	Record the measured level for the mid-band marker.			dBm					
37.	Record the initial measured at 7900 B.	slope (dB p-p) as determined 0 MHz and 8400 MHz in the ta	by the difference in level able above for BUC A / SSPA	ОК	ок				
	PROCEDURE / REPORT OF TEST № 7.3.3								
--	--	--	--	--------------------	-------------	-----------	--	--	
TEST NAME: T-2 Amplitude Response and Slope Equalizer Alignment Element UNDER TEST: TX Subsystem		ystem Serial Nº and/or version:		:					
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP		TEST SEQUENCE	-	EXPECTED RESULT	RESULT	REMARKS			
38.	Slope Equalizer S 1. Determin slope. 2. Adjust th 3. Adjust th recorder 4. Record to above.	 <u>Slope Equalizer Setting</u> Determine the optimum slope equalization to compensate for the slope. Adjust the slope value for optimum path slope compensation. Adjust the Slope Equalizer attenuator setting to achieve the recorded mid-band level in step 36. Record the final BUC A / SSPA B Slope Equalizer settings in table above. 			ок				
39.	Capture the Netw	vork Analyzer Trace and paste	it below.	ОК	ОК				
		Pas	ste BUC A / SSPA B Amplitude	Response JPG here.					
40.	Switch BUC B.			ОК	ОК				
41.	Set the Slope Equalizer slope and attenuator to the "SSPA B" values in the table on page 48.			ОК	ок				
42.	Record the measured level for the mid-band marker.		dBm						
43.	Record the initial measured at 790 B.	slope (dB p-p) as determined 0 MHz and 8400 MHz in the ta	by the difference in level ble above for BUC B / SSPA	ОК	ок				

	PROCEDURE / REPORT OF TEST Nº 7.3.3								
TEST NAME: T-2 Amplitude Response and Slope Equalizer Alignment		ELEMENT UNDER TEST: TX Subsystem			Serial № and/or version:				
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP		TEST SEQUENCE	E	EXPECTED RESULT	RESULT	REMARKS			
44.	 <u>Slope Equalizer Setting</u> Determine the optimum slope equalization to compensate for the slope. Adjust the slope value for optimum path slope compensation. Adjust the Slope Equalizer attenuator setting to achieve the recorded mid-band level in step 42. Record the final BUC B / SSPA B Slope Equalizer settings in table above 		Max P-P variation is 2 dB (+/- 1 dB).	ок					
45.	Capture the Netw	ork Analyzer Trace and paste	it below.	ОК	ОК				
	Paste BUC B / SSPA B Amplitude Response JPG here.								
46	Set both SSPAs t mode.	o Standby and switch the SSF	PAs to Combined Off-line	ОК	ОК				

7.3.4 <u>T-1 Amplitude Response and Slope Equalizer Adjustment</u>

			PROCEDURE / REPORT OF	TEST № 7.3.4		
TEST NAN Response Equalizer A	TEST NAME: T-1 Amplitude Response and Slope ELEMENT UNDER TEST: TX Subsy Equalizer Alignment Element under test: TX Subsy		/stem Serial Nº and/or version:		:	
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS
1.	 Configure and calibrate Network Analyzer for -10 dBm input of a swept 1200 MHz ± 250 MHz, measuring an upconverted frequency of 8150 MHz ± 250 MHz and measurements of 502 points, 0.996 MHz. 			ОК	ок	
2.	 Adjust Network Analyzer settings to: 1. Averaging = 10 2. Smoothing = 2 3. IF BW = 30K 4. Scale Per Div = 1 5. Coupler Factor Offset 			ОК	ок	
3.	Ensure the TWTA	Ensure the TWTAs are set to Combine Off-Line.			ОК	
4.	Apply power to be	oth TWTAs and ensure both are	commanded to Standby.	OK	ОК	
5.	Set the Slope Equivalues in the table	ualizer slope and attenuator to th e on page 53.	e "Combined TWTA"	ОК	ок	
6.	Confirm that the	TWTA attenuators are set as per	table on page 53.	OK	ОК	
7.	Connect the Netw Patch Panel and	vork Analyzer port 1 inject at J61 patch EBEM 1 for T-1 transmit o	of the Uplink L-Band perations.	ОК	ок	
8.	Connect the Netv	vork Analyzer port 2 receive cabl	e to T-1 DC1.	OK	ОК	
9.	Switch to BUC A.		OK	ОК		
10.	Command the TWTAs to transmit and allow them to warm until the temperature settles out.			ОК	ок	
11.	On the Network A and 8400 MHz).	Analyzer, activate markers, low-n	nid-high band. (7900, 8150	ОК	ок	

	PROCEDURE / REPORT OF TEST Nº 7.3.4									
TEST NAM Response Equalizer Al	IE: T-1 Amplitude and Slope lignment	EL	ELEMENT UNDER TEST: TX Subsystem				Serial №	Serial Nº and/or version:		
		TEST CONDUCTOR:	Q/	ENG:		CUSTOMER:	DATI	E START:	DATE END:	
STEP		TEST SEQUEN	ICE		EX	PECTED RESULT	- RI	ESULT	REMARKS	
12.	Record the meas	ured level for the mid-band	marker.			dBm				
13.	Record the initial slope (dB p-p) as determined by the difference in level measured at 7900 MHz and 8400 MHz in table below for BUC A / Comb. TWTAs.					OK		ок		
		T-	1 Amplitude Re	sponse and	Slope Equa	lizer Alignment				
		Slope Equalizer	Initial Slope (dB)	On-Line BUC	On-Line TWTA	Slope Preset (dB)	Attenuation (dB)			
		4.6m		A	A+B					
		4.6m		В	A+B					
		4.6m		A	A					
		4.6m		В	В					
		4.6m		A	В					
		4.6m		В	A					

	PROCEDURE / REPORT OF TEST № 7.3.4								
TEST NAM Response Equalizer Ali	TEST NAME: T-1 Amplitude Response and Slope Equalizer Alignment		IENT UNDER TEST: TX Subs	ystem Serial Nº and/or version:		:			
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP		TEST SEQUENCE	E	EXPECTED RESULT	RESULT	REMARKS			
14.	 <u>Slope Equalizer Setting</u> Determine the optimum slope equalization to compensate for the slope. Adjust the slope value for optimum path slope compensation. Adjust the Slope Equalizer attenuator setting to achieve the recorded mid-band level in step 12. Record the final BUC A / Comb. TWTAs Slope Equalizer settings in table above. Caution: The slope and gain settings of the equalizer are interactive. Changing slope compensation will change gain. The output level of the TWTA must be carefully monitored while adjusting the slope equalizer. 		Max P-P variation is 2 dB (+/- 1 dB).	ок					
15.	Capture the Netw	vork Analyzer Trace and paste	it below.	ОК	ОК				
		Paste	BUC A / COMB TWTA Amplitu	ude Response JPG here.					
16.	Switch to BUC B.			ОК	ОК				
17.	Set the Slope Equalizer slope and attenuator to the "Combined TWTA" values in the table on page 53.		ОК	ОК					
18.	Record the meas	ured level for the mid-band ma	arker.	dBm					
19.	Record the initial measured at 790 TWTAs.	slope (dB p-p) as determined 0 MHz and 8400 MHz in the ta	by the difference in level ble above for BUC B / Comb.	ОК	ок				

	PROCEDURE / REPORT OF TEST № 7.3.4							
TEST NAME: T-1 Amplitude Response and Slope Equalizer Alignment ELEMENT UNDER TEST: TX Subsy		ystem Serial Nº and/or version:		:				
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
STEP		TEST SEQUENCE	Ē	EXPECTED RESULT	RESULT	REMARKS		
20.	Slope Equalizer Setting 1. Determine the optimum slope equalization to compensate for the slope. 2. Adjust the slope value for optimum path slope compensation. 3. Adjust the Slope Equalizer attenuator setting to achieve the recorded mid-band level in step 18. 4. Record the final BUC B / Comb. TWTAs Slope Equalizer settings in table above.			Max P-P variation is 2 dB (+/- 1 dB).	ок			
21.	Capture the Netw	vork Analyzer Trace and paste	it below.	OK	ОК			
		Paste	BUC B / COMB TWTA Amplitu	ude Response JPG here.				
22.	Switch to TWTAs	to TWTA A Maintenance mo	de.	ОК	ОК			
23.	Set the Slope Equalizer slope and attenuator to the "TWTA A" values in the table on page 53.			ОК	ок			
24.	Record the measured level for the mid-band marker.		dBm					
25.	Record the initial slope (dB p-p) as determined by the difference in level measured at 7900 MHz and 8400 MHz in the table above for BUC B / TWTA A.			ОК	ок			

	PROCEDURE / REPORT OF TEST № 7.3.4								
TEST NAME: T-1 Amplitude Response and Slope Equalizer AlignmentELEMENT UNDER TEST: TX Subsystem		system	Serial Nº and/or version	:					
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS			
26.	Slope Equalizer S 1. Determin slope. 2. Adjust th 3. Adjust th recorder 4. Record to above.	Setting ne the optimum slope equaliza ne slope value for optimum pa ne Slope Equalizer attenuator d mid-band level in step 24. the final BUC B / TWTA A Slop	ation to compensate for the th slope compensation. setting to achieve the pe Equalizer settings in table	Max P-P variation is 2 dB (+/- 1 dB).	ок				
27.	Capture the Netw	ork Analyzer Trace and paste	it below.	ОК	ОК				
		Pas	ste BUC B / TWTA A Amplitude	e Response JPG here.					
28.	Switch to BUC A.			ОК	ок				
29.	Set the Slope Equalizer slope and attenuator to the "TWTA A" values in the table on page 53.			ОК	ок				
30.	Record the measured level for the mid-band marker.			dBm					
31.	Record the initial measured at 790	slope (dB p-p) as determined 0 MHz and 8400 MHz in the ta	by the difference in level able above for BUC A / TWTA	ОК	ок				

	PROCEDURE / REPORT OF TEST № 7.3.4								
TEST NAM Response Equalizer Ali	TEST NAME: T-1 Amplitude Response and Slope Equalizer Alignment ELEMENT UNDER TEST: TX Sub		system Serial Nº and/or version:		:				
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP		TEST SEQUENCI	Ē	EXPECTED RESULT	RESULT	REMARKS			
32.	Slope Equalizer S 1. Determin slope. 2. Adjust th 3. Adjust th recorder 4. Record to above.	 <u>Slope Equalizer Setting</u> Determine the optimum slope equalization to compensate for the slope. Adjust the slope value for optimum path slope compensation. Adjust the Slope Equalizer attenuator setting to achieve the recorded mid-band level in step 30. Record the final BUC A / TWTA A Slope Equalizer settings in table above. 							
33.	Capture the Netw	ork Analyzer Trace and paste	it below.						
		Pas	ste BUC A / TWTA A Amplitude	e Response JPG here.					
34.	Switch to TWTAs	to TWTA B Maintenance mo	de.	ОК	ок				
35.	Set the Slope Equalizer slope and attenuator to the "TWTA B" values in the table on page 53.			ОК	ок				
36.	Record the measured level for the mid-band marker.			dBm					
37.	Record the initial measured at 790 B.	slope (dB p-p) as determined 0 MHz and 8400 MHz in the ta	by the difference in level able above for BUC A / TWTA	ОК	ок				

	PROCEDURE / REPORT OF TEST № 7.3.4							
TEST NAME: T-1 Amplitude Response and Slope Equalizer Alignment ELEMENT UNDER TEST: TX Subsy		ystem Serial Nº and/or version:		:				
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
STEP		TEST SEQUENCE	Ē	EXPECTED RESULT	RESULT	REMARKS		
38.	Slope Equalizer S 1. Determin slope. 2. Adjust th 3. Adjust th recorded 4. Record to above.	 <u>Slope Equalizer Setting</u> Determine the optimum slope equalization to compensate for the slope. Adjust the slope value for optimum path slope compensation. Adjust the Slope Equalizer attenuator setting to achieve the recorded mid-band level in step 36. Record the final BUC A / TWTA B Slope Equalizer settings in table above. 			ок			
39.	Capture the Netw	ork Analyzer Trace and paste	it below.	OK	ОК			
		Pas	ste BUC A / TWTA B Amplitude	e Response JPG here.				
40.	Switch BUC B.			ОК	ОК			
41.	Set the Slope Equalizer slope and attenuator to the "TWTA B" values in the table on page 53.			ОК	ок			
42.	Record the measured level for the mid-band marker.			dBm				
43.	Record the initial measured at 7900 B.	slope (dB p-p) as determined 0 MHz and 8400 MHz in the ta	by the difference in level ble above for BUC B / TWTA	ОК	ок			

	PROCEDURE / REPORT OF TEST Nº 7.3.4								
TEST NAME: T-1 Amplitude Response and Slope Equalizer Alignment		ELEMENT UNDER TEST: TX Subsystem			Serial № and/or version:				
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP		TEST SEQUENCE	E	EXPECTED RESULT	RESULT	REMARKS			
44.	 <u>Slope Equalizer Setting</u> Determine the optimum slope equalization to compensate for the slope. Adjust the slope value for optimum path slope compensation. Adjust the Slope Equalizer attenuator setting to achieve the recorded mid-band level in step 42. Record the final BUC B / TWTA B Slope Equalizer settings in table above. 		Max P-P variation is 2 dB (+/- 1 dB).	ок					
45.	Capture the Netw	ork Analyzer Trace and paste	it below.	ОК	ОК				
	Paste BUC B / TWTA B Amplitude Response JPG here.								
46	Set both TWTAs mode.	to Standby and switch the TW	TAs to Combined Off-line	ОК	ОК				

7.4 RX Receive Chain Level Alignment

7.4.1 T-2 LNA Gain and Receive Chain Level Alignment

The procedures in this section are summarized in the T-2 Receive System figure below.



Set T-2 RECEIVE GAIN to 105 dB

- 1a. If at least 1 LNA is found to be in specification during testing, inject 7500 MHz CW at a level of -62 dBm into LNA input.
- 1b. If both LNAs are found to be in specification during testing, inject 7500 MHz CW at a level of -11 dBm into J1 of LNA Bulkhead Assembly.
- 2. Adjust the gain of each BDC to achieve a level of -10 dBm at J72 of Downlink L-Band Patch Panel.
- 3. Adjust the gain of the L-Band Amplifier in the Downlink L-Band Patch Panel to achieve a level of 0 dBm at the input to EBEM Modem #1.

			PROCEDURE / REPORT O	F TEST № 7.4.1		
TEST NAM Gain and Chain Level	TEST NAME: T-2 LNA Gain and Receive ELEMENT UNDER TEST: RX Subsy Chain Level Alignment ELEMENT UNDER TEST: RX Subsy			stem Serial Nº and/or version:		
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUEN	CE	EXPECTED RESULT	RESULT	REMARKS
1.	Point the T-2	antenna to cold sky.		ОК	ОК	
2.	Command LNA A on-line			ОК	ОК	
3.	 Configure and calibrate Network Analyzer to inject a swept 7500 MHz ± 250 MHz at -62 dBm with measurements of 502 points, 0.996 MHz at DC3. (Set input level to account for DC3 Coupling Factor) 			ОК	ок	
4.	Adjust Network Analyzer settings to: 1. Averaging = 10 2. Smoothing = 2 3. IF BW = 30K 4. Scale Per Div = 1 5. Coupler Factor Offset			ОК	ок	
5.	Connect the N	Network Analyzer port 1 inject c	able to DC3.	OK	ОК	
6.	Connect the N	Network Analyzer port 2 receive	cable to J1 at the LNA Plate.	ОК	ОК	
7.	On the Netwo and 7750 MH	rk Analyzer, activate markers, l z)	ow-mid-high band. (7250, 7500	ОК	ок	
8.	Record LNA A	A gain at 7500 MHz.		>50 dB	dB	
9.	Capture Netw	ork Analyzer Trace for the LNA	A and paste it below.	ОК	ОК	
			Paste LNA-A > Amplitude Re	sponse JPG here.		
10.	Command LN	IA B on-line		ОК	ОК	
11.	Record LNA E	3 gain at 7500 MHz.		>50 dB	dB	
12.	Capture Netw	ork Analyzer Trace for the LNA	B and paste it below.	OK	ОК	
			Paste LNA-B > Amplitude Re	sponse JPG here.		

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	PROCEDURE / REPORT OF TEST Nº 7.4.1								
TEST NAME: T-2 LNA Gain and Receive ELEMENT UNDER TEST: RX Subsystem Chain Level Alignment ELEMENT UNDER TEST: RX Subsystem		stem	Serial № and/or version	:					
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP		TEST SEQUEN	CE	EXPECTED RESULT	RESULT	REMARKS			
	Note : If practical, as the test setup is still configured for sweeping single LNAs, consider sweeping the T-1 LNAs now (in Section 7.4.2), and then continuing with the full Rx-chain calibration of the T-2.								
13.	Inject a CW of 7500 MHz \pm 250 MHz at -62 dBm (Set input level to account for DC3 Coupling Factor). Note : If both LNAs are below specification and not replaced, the next part of this procedure should be completed injecting a CW of 7500 MHz at -11 dB in to J1.			ОК	ок				
14.	Command the LNA on-line that is closest to normal specification (51 dB). Record which LNA is selected.			LNA A or LNA B	LNA A				
15.	Command BD	OC A on-line.		ОК	ОК				
16.	Monitor J72 a that the cable	t the Downlink Patch Panel with loss is accounted for at 1200 M	n a Spectrum Analyzer. Ensure /IHz.	ОК	ок				
17.	Adjust the gai	n of BDC A until -10 dBm is me	easured at J72.	ОК	ОК				
18.	Command BD	OC B on-line.		ОК	ОК				
19.	Adjust the gai	n of BDC B until -10 dBm is me	easured at J72.	OK	ОК				
20.	Slide out the I	Downlink Patch Panel and remo	ove the top cover.	OK	ОК				
21.	Monitor J40 at the Downlink Patch Panel with a Spectrum Analyzer. Ensure that the cable loss is accounted for at 1200 MHz.			ОК	ОК				
22.	Adjust the gain of the T-2 Downlink Amplifier until 0 dBm is measured at cable W231 J8 on EBEM 1 (Patch Modem 1 for T-2 receive operation).			ОК	ОК				
23.	Command BD	DC A online.		ОК	ок				

	PROCEDURE / REPORT OF TEST Nº 7.4.1								
TEST NAME: T-2 LNA Gain and Receive Chain Level Alignment		ELEMENT UNDER TEST: RX Subsystem		Serial Nº and/or version:					
		TEST CONDUCTOR: QA ENG: CUSTOMER:			DATE START:	DATE END:			
STEP	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS			
24.	Adjust the gain of the T-2 Downlink Amplifier until 0 dBm is measured at cable W231 J8 on EBEM 1.			ОК	ок				
25.	Remove test equipment and normalise the T-2 downlink.			ОК	ок				
26.	Connect a Multimeter to the T-2 LNA A test point on top of the LNA Controller, Check and Adjust POT as required. Record the result.			6.5 VDC	VDC				
27.	Connect a Mu Controller, Ch	Iltimeter to the T-2 LNA B test p neck and Adjust POT as required	oint on top of the LNA d. Record the result.	6.5 VDC	VDC				

7.4.2 T-1 LNA Gain and Receive Chain Level Alignment

The procedures in this section are summarized in the T-1 Receive System figure below.



Set T-1 RECEIVE GAIN to 105 dB

1a. If at least one LNA is found to be in specification during testing, inject 7500 MHz CW at a level of -56 dBm into LNA input and use that LNA for the rest of the procedure.

1b. If both LNAs are found to be out of specification during testing, inject 7500 MHz CW at a level of -5 dBm into J1 of LNA Bulkhead Assembly.

2. Adjust the gain of each BDC to achieve a level of -10 dBm at J76 of Downlink L-Band Patch Panel.

3. Adjust the gain of the L-Band Amplifer in the Downlink L-Band Patch Panel to achieve a level of 0 dBm at the input to EBEM Modem #1.

PROCEDURE / REPORT OF TEST Nº 7.4.2								
TEST NAME: T-1 LNA Gain and Receive Chain Level Alignment			ystem	ystem Serial Nº and/or version:				
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
1.	Point the T-1 antenna to cold sky.			ОК	ОК			
2.	Command LNA A	on-line		ОК	ОК			
3.	Configure and calibrate Network Analyzer to inject a swept 7500 MHz ± 250 MHz at -62 dBm with measurements of 502 points, 0.996 MHz at DC3. (Set input level to account for DC3 Coupling Factor)			ОК	ок			
4.	 Adjust Network Analyzer settings to: 1. Averaging = 10 2. Smoothing = 2 3. IF BW = 30K 4. Scale Per Div = 1 5. Coupler Factor Offset 			ОК	ок			
5.	Connect the Netwo	ork Analyzer port 1 inject cable	e to DC3.	ОК	ОК			
6.	Connect the Netwo	ork Analyzer port 2 receive cat	ble to J1 at the LNA Plate.	ОК	ОК			
7.	On the Network Ar and 7750 MHz)	nalyzer, activate markers, low-	mid-high band. (7250, 7500	ОК	ок			
8.	Record LNA A gai	n at 7500 MHz.		>50 dB	dB			
9.	Capture Network A	Analyzer Trace for the LNA A a	and paste it below.	ОК	ОК			
		F	Paste LNA-A > Amplitude Re	sponse JPG here.				
10.	Command LNA B	on-line		OK	ОК			
11.	Record LNA B gai	n at 7500 MHz.		>50 dB	dB			
12.	Capture Network A	Analyzer Trace for the LNA B a	and paste it below.	OK	ОК			

PROCEDURE / REPORT OF TEST Nº 7.4.2									
TEST NAM and Rece Alignment	TEST NAME: T-1 LNA Gain and Receive Chain Level Alignment			system Serial Nº and/or version:					
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS			
	Paste LNA-B > Amplitude Response JPG here.								
13.	 Inject a CW of 7500 MHz ± 250 MHz at -62 dBm (Set input level to account for DC3 Coupling Factor). Note: If both LNAs are below specification and not replaced, the next part of this procedure should be completed injecting a CW of 7500 MHz at -5 dB in to J1. 			ОК	ок				
14.	Command the LNA on-line that is closest to normal specification (51 dB). Record which LNA is selected.			LNA A or LNA B	LNA A				
15.	Command BDC A on-line.			ОК	ОК				
16.	Monitor J76 at the that the cable loss	Downlink Patch Panel with a Sp is accounted for at 1200 MHz.	ectrum Analyzer. Ensure	ОК	ок				
17.	Adjust the gain of	BDC A until -10 dBm is measure	d at J76.	ОК	ОК				
18.	Command BDC B	on-line.		ОК	ОК				
19.	Adjust the gain of	BDC B until -10 dBm is measure	d at J76.	ОК	ОК				
20.	Slide out the Dowr	nlink Patch Panel and remove the	e top cover.	ОК	ОК				
21.	Monitor J56 at the that the cable loss	Downlink Patch Panel with a Sp is accounted for at 1200 MHz.	ectrum Analyzer. Ensure	ОК	ОК				
22.	Adjust the gain of cable W231 J8 on	the T-2 Downlink Amplifier until (EBEM 1 (Patch Modem 1 for T-:) dBm is measured at 2 receive operation).	ОК	ОК				
23.	Command BDC A	online.		ОК	ОК				
24.	Adjust the gain of cable W231 J8 on	the T-2 Downlink Amplifier until (EBEM 1.) dBm is measured at	ОК	ок				

	PROCEDURE / REPORT OF TEST Nº 7.4.2								
TEST NAME: T-1 LNA Gain and Receive Chain Level Alignment		ELEMENT UNDER TEST: TX Subsystem			Serial № and/or version:				
		TEST CONDUCTOR:	TEST CONDUCTOR: QA ENG: CUSTOMER:			DATE END:			
STEP	TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS				
25.	Remove test equip	ment and normalise the T-2 do	wnlink.	ОК	ок				
26.	Connect a Multimeter to the T-1 LNA A test point on top of the LNA Controller, Check and Adjust POT as required. Record the result.			6.5 VDC	VDC				
27.	27. Connect a Multimeter to the T-1 LNA B test point on top of the LNA Controller, Check and Adjust POT as required. Record the result.		6.5 VDC	VDC					

7.5 RX Amplitude Response

7.5.1 <u>T-2 Rx Amplitude Response</u>

	PROCEDURE / REPORT OF TEST № 7.5.1									
TEST Amplit	NAME: T-2 Rx tude Response	ELEMENT UNDER TEST: T-2 Rx Subsystem		ubsystem	Serial № and/or version:					
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS				
1.	Point the T-2 the antenna to cold sky.									
2.	Configure and calibrate Network Analyzer to inject a swept 7500 MHz \pm 250 MHz at -62 dBm with measurements of 502 points, 0.996 MHz at DC3. (Set input level to account for DC3 Coupling Factor)			ОК	ок					
3.	 Adjust Network Analyzer settings to: 1. Averaging = 10 2. Smoothing = 2 3. IF BW = 30K 4. Scale Per Div = 1 5. Coupler Factor Offset 			ОК	ок					
4.	Connect the Netw	ork Analyzer port 1 inject cable	e to DC3.	OK	ОК					
5.	Connect the Netw L-Band Patch Par	ork Analyzer port 2 receive cal nel and patch Modem 1 for T-2	ble to J40 of the Downlink receive operation.	ОК	ок					
6.	Command LNA A	on-line and BDC A on-line		OK	ОК					
7.	Command BDC A	on-line		OK	ОК					
8.	On the Network Analyzer, activate markers, low-mid-high band. (950, 1200 and 1450 MHz)			ОК	ок					
9.	T-2 LNA A - BDC	A, save the trace as a JPEG a	nd paste below.	Max P-P variation is 5 dB (+/- 2.5 dB).	ок					
		Paste	the LNA A - BDC A Amplitude	e Response JPEG Here						

	PROCEDURE / REPORT OF TEST № 7.5.1								
TEST Amplit	TEST NAME: T-2 RxELEMENT UNDER TESAmplitude ResponseELEMENT UNDER TES		T UNDER TEST: T-2 R	x Subsystem	Serial № and/or version:				
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS			
10.	10. Command BDC B on-line			ОК	ОК				
11.	. T-2 LNA A - BDC B, save the trace as a JPEG and paste below.			Max P-P variation is <mark>5</mark> dB (+/- 2.5 dB).	ОК				
		Paste th	e LNA A - BDC B Ampl	tude Response JPEG Here					
12.	Command LNA B	on-line		ОК	ОК				
13.	T-2 LNA B - BDC	B, save the trace as a JPEG and	d paste below.	Max P-P variation is <mark>5</mark> dB (+/- 2.5 dB).	ОК				
		Paste th	e LNA B - BDC B Ampl	tude Response JPEG Here					
14.	Command BDC A	A on-line		ОК	ОК				
15.	T-2 LNA B - BDC A, save the trace as a JPEG and paste below.			Max P-P variation is <mark>5</mark> dB (+/- 2.5 dB).	ОК				
		Paste th	e LNA B - BDC A Ampl	tude Response JPEG Here					
16.	Command LNA A	on-line.		ОК	ОК				

7.5.2 <u>T-1 Rx Amplitude Response</u>

	PROCEDURE / REPORT OF TEST Nº 7.5.2									
TEST Amplit	NAME: T-1 Rx tude Response	ELEMEN	IT UNDER TEST: T-1 Rx Su	ubsystem	Serial Nº and/or versio	n:				
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS				
1.	Point the T-1 the antenna to cold sky.									
2.	 Configure and calibrate Network Analyzer to inject a swept 7500 MHz ± 250 MHz at -56 dBm with measurements of 502 points, 0.996 MHz at DC3. (Set input level to account for DC3 Coupling Factor) 			ОК	ок					
3.	Adjust Network Analyzer settings to: 1. Averaging = 10 2. Smoothing = 2 3. IF BW = 30K 4. Scale Per Div = 1 5. Coupler Factor Offset			ОК	ок					
4.	Connect the Netw	vork Analyzer port 1 inject cable	to DC3.	ОК	ОК					
5.	Connect the Netw L-Band Patch Par	vork Analyzer port 2 receive cab nel and patch Modem 1 for T-1 r	e to J56 of the Downlink eceive operation.	ОК	ок					
6.	Command LNA A	on-line and BDC A on-line		ОК	ОК					
7.	Command BDC A	A on-line		OK	ОК					
8.	On the Network A and 1450 MHz)	nalyzer, activate markers, low-n	nid-high band. (950, 1200	ОК	ок					
9.	T-1 LNA A - BDC	A, save the trace as a JPEG an	d paste below.	Max P-P variation is 5 dB (+/- 2.5 dB).	ОК					
		Paste t	ne LNA A - BDC A Amplitude	e Response JPEG Here						
10.	Command BDC E	3 on-line		ОК	ОК					

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	PROCEDURE / REPORT OF TEST № 7.5.2								
TEST Amplit	NAME: T-1 Rx tude Response	ELEME	NT UNDER TEST: T-1 Rx S	Subsystem	Serial № and/or version:				
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP	STEP TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS			
11.	11. T-1 LNA A - BDC B, save the trace as a JPEG and paste below.			Max P-P variation is <mark>5</mark> dB (+/- 2.5 dB).	ОК				
		Paste t	the LNA A - BDC B Amplitu	de Response JPEG Here					
12.	Command LNA B	on-line		ОК	ОК				
13.	T-1 LNA B - BDC	B, save the trace as a JPEG ar	nd paste below.	Max P-P variation is <mark>5</mark> dB (+/- 2.5 dB).	ок				
		Paste t	the LNA B - BDC B Amplitu	de Response JPEG Here					
14.	Command BDC A	A on-line		ОК	ОК				
15.	T-1 LNA B - BDC A, save the trace as a JPEG and paste below.			Max P-P variation is <mark>5</mark> dB (+/- 2.5 dB).	ок				
		Pastet	the LNA B - BDC A Amplitu	de Response JPEG Here					
16.	Command LNA A	on-line.		ОК	ОК				

8 FUNCTIONALITY CHECKS

8.1 ASNMC Functionality Test

	PROCEDURE / REPORT OF TEST № 8.1								
TEST NA Functionality	TEST NAME: ASNMC ELEMENT UNDER TEST: ASN Functionality Image: Comparison of the second se		MC	AC Serial № and/or version:					
PROJECT:	TEST	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
ISGI	MATRIX:								
STEP	P TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS			
1.	1.6.1_20150127_NU_ASNMC_Functionalty_Test_Procedure Open Computer and check Fan operations clean inlet and outlets				ок				
2.	Check available Backup batteries and replace if needed				ОК				
3.	Check ASNMC Computer is having latest version installed and functioning properly			Win7 prof. ASNMC Ver.1.2.1	ок				
4.	Check ASNMC C installed and fund	Computer is having latest de ctioning properly	sktop NCIA BG Info logo		ОК				
5.	Check the IP con address.	figuration recording to be su	ure the MACS has the proper IP		ок				
6.	Check RDP (Ren	note Desk Top operation) F	unctioning properly		ок				
7.	Check SMS kit In	stallation performed and Po	orts are configured.		N/A				
8.	Check iDirect EC	W modem is reachable via	ASNMC Computer.		ок				
	Download modem configuration to desktop and check modem is having latest operational option file loaded. (desired for dedicated Network)								
9.	Configure EOW i CW, CF 950 MHz	Direct modem of the ASNM z, Output power -15 dBm.	C or signal generator as follow;		ок				

	PROCEDURE / REPORT OF TEST № 8.1								
TEST NAME: ASNMC Functionality			ELEMENT UNDER TEST: ASNI	ЛС	Serial Nº and/or version:				
PROJECT:	TEST	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
ISGI	MATRIX:								
STEP		TEST SEQUEN	CE CE	EXPECTED RESULT	RESULT	REMARKS			
10.	Configure setup for T-1, measure the CW signal at the TX Power out port of the T-1 Antenna.			LBAND /XBAND					
				-23.5 dBm /33.0 dBm					
	CF 1200 MHz	CF 1200 MHz							
	CF 1450 MHz			-23.5 dBm /33.0 dBm					
11.	Configure setup f	for T-2, measure on "RF TX (OUT", apply measurements for	LBAND /XBAND					
	CF 950 MHz	d the value measured.		-23.5 dBm /39.0 dBm					
	CF 1200 MHz			-23.5 dBm /39.0 dBm					
	CF 1450 MHz			-23.5 dBm /39.0 dBm					
12.	Go to the right satellite (depending on the option file) and make sure that the IDirect modem gets Rx lock. The most left LED will be steady green. Switch the HPAs combined to antenna and wait till all LEDs on the modem are steady green Capture print screen of iDirect on ASNMC GUI.			Sync/ All LEDs green	ок				

PROCEDURE / REPORT OF TEST № 8.1								
TEST NA Functionality	ME: ASNMC		ELEMENT UNDER TEST: ASNI	МС	Serial Nº and/or versior	Serial № and/or version:		
PROJECT:	TEST	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
TSGT	MATRIX:							
STEP		TEST SEQUEN	CE	EXPECTED RESULT	RESULT	REMARKS		
		Tx rate (Kbps)	1015.313 Tx type Tx modulation Tx FEC	Burst Tx state Ena QPSK RF ON RF C0.793	off			
		Rx rate (Kbps)	1015.313 Rx type S Rx freq. (MHz) 14 Rx modulation C Rx FEC TP	SCPC Rx state Ena 30.458 SNR (dB) 8 QPSK Rx AGC (dBm) -24 C0.793 -24	bled .9 .15			
		Common Status Network Temperature (°C	Normal Access N Enabled) 39	lormal Re	eset			
13.	Logon to the LCA Double click on th window, NCCA an Capture print scre	and start the ASNMC software NCCx Access field and r and NCCP access is available and NCCX Access on ASI	vare. make sure that, in the resulting e over ICC. NMC GUI.		ок			

PROCEDURE / REPORT OF TEST № 8.1									
TEST NA Functionality	ME: ASNMC		ELEMENT UNDER TEST	: ASNI	ИС		Serial № and/or	r version:	
PROJECT:	TEST	TEST CONDUCTOR:	QA ENG:		CUSTOMER:		DATE START:		DATE END:
1301									
STEP		TEST SEQUEN	CE		EXPECTED RES	SULT	RESULT	•	REMARKS
		MCCx Access [Conne	ected]				3		
		NCCx Access	General alarm		Normal				
			ASNMC router interfa	aces –					
			NR LAN		Available				
			NGCS VRF		Available				
			EMS VRF		Available				
				NCO					
		NCCP def. active rou	te ICC	N	CA def. active route	Nor	ne		
		NCCP via ICC	Available	N	CCA via ICC	Avail	able		
		NCCP ICC hub	F11	N	CCA ICC hub	F1	.1 vilable		
		NCCP via EMS	Unavailable	N	CCA via EMS	Unava	ilable		
14.	Connect the SNO on the extended	M NR IP phone to the dedic Direct modem port perform	cated port on the EloW cha a functionality test	annel			ОК		
15.	Establish connectivity between the ASNMC VPN router and the remote post connect SNOM NU IP phone to the dedicated port on the remote port SW and perform a functionality test						ОК		
16.	Establish connect remote ASNMC c perform a functior	stablish connectivity between the ASNMC VPN router and connect the mote ASNMC computer to the dedicated port on the Remote port SW and erform a functionality test					ок		
17.	Establish connect M&C computer ar	ivity between the ORION M nd perform a functionality te	&C switch and the remote st				ок		

	PROCEDURE / REPORT OF TEST Nº 8.1									
TEST NAME: ASNMC Functionality ELEMENT UNDER TEST: ASNME			MC	Serial Nº and/or version	:					
PROJECT:	TEST	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
TSGT	MATRIX:									
STEP		TEST SEQUEN	CE	EXPECTED RESULT	RESULT	REMARKS				
18.	Log on to ASNM	C DWS computer and check	current ASNMC GUI version	Win7 prof.	OK					
	for Ver. ASNMC	Ver.1.2.1		ASNMC Ver.1.2.1						
19.	Check ASNMC DWS Computer is having latest desktop NCIA BG. Info logo installed and functioning properly				ок					
20.	20. Log on VPN ROUTER/SWITCH and Check Configured Properly. Cooling Fans and Backup battery is keeping configuration.				ок					

8.2 Modem Tests

8.2.1 EMS CW Carrier Transmission

	PROCEDURE / REPORT OF TEST Nº 8.2.1									
TEST NAME: T-1 only EMS CW carrier transmission.		ELEMENT UNDER TEST: EMS		Serial № and/or version:						
PROJEC	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
I: ISGI	4.5 (FAT)									
STEP		TEST SEQUENCE	-	EXPECTED RESULT	RESULT	REMARKS				
1	1.7.1_20150127_NU_EMS_	Functionalty_Test_Procedure			ОК					
1.	Open Computer and check Fan operations clean inlet and outlets									
2.	Check EMS Computer and VM is having latest Firmware/SW installed and communicating			V.02.01.12	ок					

	PROCEDURE / REPORT OF TEST Nº 8.2.1						
TEST NAM transmissio	IE: T-1 only EMS CW carrier		ELEMENT UNDER TEST	EMS	Serial Nº and/or versio	n:	
PROJEC T: TSGT	TEST MATRIX: 4.5 (FAT)	TEST CONDUCTO	DR: QA ENG:	CUSTOMER:	DATE START:	DATE END:	
STEP	I	TEST SEQUENCE	I	EXPECTED RESULT	RESULT	REMARKS	
3.	Check EMS 8U Modem Rack is having latest Firmware/SW installed and communicating logging-on to LMC, launch LMS. > <i>Display MR autotest</i> :						
	Component	Version	Sub-component	Version			
	EMU ECU UC G2.0	V9.6 V1.1 Ed2 V3.05	LIA BOOTPP TESTCAGE GESTCARMIN LCTL-EMU SMS STS FPGATEST FPGAMFC2 ¹ BOOTPP DSP_LPP DSP_LPP DSP_NEMS ² DSP_TEST LOG_OPE LIA	V3.01 V4.09 V5.28 V1.15 V9.6 V1.1 01.01 02.10 05.03 03.03 03.22 03.02 12K20 04.04			
11.	Check all CU cards working I	Properly		Only 8U Modem Rack	ОК		
12.	Check all PSUs are working	heck all PSUs are working Properly		Only 8U Modem Rack	ОК		
13.	Check cooling fan Try cooling	g Properly		Only 8U Modem Rack	ОК		
9.	Replace the back-up battery.	Apply a battery replace	cement label on the board.	Only 8U Modem Rack	ОК		
10.	Apply 10 MHz reference calib	pration on 8U Modem I	Rack		ОК		

		PROCE	EDURE / REPORT O	F TEST № 8.2.1		
TEST NAME: transmission.	T-1 only EMS CW carrier	ELEM	IENT UNDER TEST	: EMS	Serial Nº and/or version:	
	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
1.1301	4.5 (FAT)					
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS
		SET THE FREQUENCY	COUNTER			
		• Connect the neque	R96	Adjusting potentiometer 10 MHz refere Frequency cou	ence Inter	

		PROCE	EDURE / REPORT C	DF TEST № 8.2.1		
TEST NAM transmissio	E: T-1 only EMS CW carrier n.	ELEN	ELEMENT UNDER TEST: EMS		Serial Nº and/or version:	
	TEST MATRIX:	TEST MATRIX: TEST CONDUCTOR: QA ENG:		CUSTOMER:	DATE START:	DATE END:
1:1561	4.5 (FAT)					
STEP		TEST SEQUENCE	-	EXPECTED RESULT	RESULT	REMARKS
	Select Up-converter A ON-L	INE and SSPA A + B ON-LINE		LBAND TX:-16.8 dBm		
	Configure modem EPM, CU1 as follow; CW, CF 1200 MHz, Output power					
	-15 dBm.					
	Connect the power meter se measure the level.	nsor to LBAND P/P EMSe1 ar	nd Enable CW and	I BAND RX-17 5 dBm		
	Make a LBAND BNC loop fr	om UPLINK to/DOWNLINK Pa	itch Panel.			
14.	Record the RX Power Level	on the LMS as seen below.		Y -BAND TY		
	Connect the power sensor to	X BAND RF test Panel and E	Enable CW and			
	Record the measured value	for CE 950 MHz -15 dBm		1-1:+40.0 dBm		
	Record the measured value	for CF 1450 MHz -15 dBm.		X- BAND IX		
	Install TX ,RX RF Chain for	CUs.		T-2:+46.0 dBm		
				ок		

	PROCEDURE / REPORT OF TEST Nº 8.2.1							
TEST NAME: transmission.	T-1 only EMS CW carrier	ELEM	ENT UNDER TEST	EMS	Serial Nº and/or version	Serial Nº and/or version:		
PROJEC	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
1.1361	4.5 (FAT)							
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
		Terminal OLGX.12 Protected Image: Constraint of the state of the st	P. Modern	es Primary Modern Backup Modern Status Tx Rx Termi				

		PROCI	EDURE / REPORT O	F TEST № 8.2.1		
TEST NAM transmission	E: T-1 only EMS CW carrier n.	ELEN	MENT UNDER TEST	: EMS	Serial Nº and/or version:	
PROJEC	TEST MATRIX:	MATRIX: TEST CONDUCTOR: QA ENG:		CUSTOMER:	DATE START:	DATE END:
I: ISGI	4.5 (FAT)					
STEP	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS
	Select Up-converter A ON-L Configure modem EPM, CU -15 dBm.	LBANDTX:-16.8 dBm				
	Connect the power meter se measure the level.	ensor to LBAND P/P EMSe1 a	nd Enable CW and	LBAND RX:-17.5 dBm		
15	Make a LBAND BNC loop from UPLINK to/DOWNLINK Patch Panel. Record the RX Power Level on the LMS as seen below. Connect the power sensor to X BAND RF test Panel and Enable CW and measure the level. (Coupler 57dbc) Record the measured value for CF 950 MHz -15 dBm. Record the measured value for CF 1450 MHz -15 dBm.			X -BAND TX T-1:+40.0 dBm X- BAND TX T-2:+46.0 dBm		
				ок		

	PROCEDURE / REPORT OF TEST Nº 8.2.1						
TEST NAME transmission.	T-1 only EMS CW carrier	ELEM	IENT UNDER TEST	EMS	Serial Nº and/or versio	Serial № and/or version:	
PROJEC	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:	
I: ISGI	4.5 (FAT)						
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS	
		THALES LMS 11:49:30 Definition 0 0 DLGX.12 Protected Protected Image: Control of the state of the	P. Moder	ns	Terminat		

	PROCEDURE / REPORT OF TEST № 8.2.1						
TEST NAM transmissio	E: T-1 only EMS CW carrier n.	ELEN	MENT UNDER TEST	: EMS	Serial Nº and/or version:		
PROJEC T: TSGT	TEST MATRIX: 4.5 (FAT)	TEST CONDUCTOR: QA ENG:		CUSTOMER:	DATE START:	DATE END:	
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS	
16	Select Up-converter A ON-L Configure modem EPM, CU -15 dBm. Connect the power meter se measure the level. Make a LBAND BNC loop fr Record the RX Power Level Connect the power sensor to measure the level. (Coupler Record the measured value Record the measured value	INE and SSPA A + B ON-LIN 3 as follow; CW, CF 1200 MH ensor to LBAND P/P EMSe1 at om UPLINK to/DOWNLINK Pa on the LMS as seen below. o X BAND RF test Panel and B 57dbc) for CF 950 MHz -15 dBm. for CF 1450 MHz -15 dBm.	E. z, Output power nd Enable CW and atch Panel. Enable CW and	LBANDTX:-16.8 dBm LBAND RX:-17.5 dBm X -BAND TX T-1:+40.0 dBm X- BAND TX T-2:+46.0 dBm			
				ок			

	PROCEDURE / REPORT OF TEST Nº 8.2.1							
TEST NAME: transmission.	T-1 only EMS CW carrier	ELEM	IENT UNDER TEST	EMS	Serial Nº and/or version	Serial № and/or version:		
PROJEC	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
1:1301	4.5 (FAT)							
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
			Links Internet	LMS - Carrier wave mode on CU 1.4				

	PROCEDURE / REPORT OF TEST Nº 8.2.1							
TEST NAM transmissio	E: T-1 only EMS CW carrier	ELEN	IENT UNDER TEST	: EMS	Serial Nº and/or versior	Serial Nº and/or version:		
PROJEC	TEST MATRIX:	ATRIX: TEST CONDUCTOR: QA ENG:		CUSTOMER:	DATE START:	DATE END:		
1:1501	4.5 (FAT)							
STEP	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS		
	Select Up-converter A ON-LINE and SSPA A + B ON-LINE. Configure modem EPM, CU4 as follow; CW, CF 1200 MHz, Output power			LBANDTX:-16.8 dBm				
	Connect the power meter se measure the level.	ensor to LBAND P/P EMSe1 a	or to LBAND P/P EMSe1 and Enable CW and					
17	 Make a LBAND BNC loop from UPLINK to/DOWNLINK Patch Panel. Record the RX Power Level on the LMS as seen below. Connect the power sensor to X BAND RF test Panel and Enable CW and measure the level. (Coupler 57dbc) Record the measured value for CF 950 MHz -15 dBm. Record the measured value for CF 1450 MHz -15 dBm. 			X -BAND TX T-1:+40.0 dBm X- BAND TX T-2:+46.0 dBm				
				ок				
PROCEDURE / REPORT OF TEST Nº 8.2.1								
-------------------------------------	---------------------------	-----------------	----------------	--	-------------------------	-----------	--	--
TEST NAME: transmission.	T-1 only EMS CW carrier	ELEM	ENT UNDER TEST	: EMS	Serial Nº and/or versio	n:		
PROJEC T: TSGT	TEST MATRIX: 4.5 (FAT)	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
		MR	P. Mo	S- Carrier wave mode on CU 1.5 Tx- Power (dBm): 15 : For 1U, range Tx Frequency (MHz). 1200 : Corrig Rx Power (dBm: +/5dBm) 20.1 : Qui Rx Prequency (MHz). 1200 000000				

	PROCEDURE / REPORT OF TEST Nº 8.2.1								
TEST NAM transmissio	E: T-1 only EMS CW carrier n.	ELEN	IENT UNDER TEST	: EMS	Serial Nº and/or version:				
PROJEC T: TSGT	TEST MATRIX: 4.5 (FAT)	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS			
Select Up-converter A ON-LINE and SSPA A + B ON-LINE. Configure modem EPM, CU5 as follow; CW, CF 1200 MHz, Output power -15 dBm. Connect the power meter sensor to LBAND P/P EMSe1 and Enable CW and				LBANDTX:-16.8 dBm LBAND RX:-17.5 dBm					
18	measure the level. Make a LBAND BNC loop fr Record the RX Power Level Connect the power sensor to measure the level. (Coupler Record the measured value Record the measured value	easure the level. the a LBAND BNC loop from UPLINK to/DOWNLINK Patch Panel. cord the RX Power Level on the LMS as seen below. nnect the power sensor to X BAND RF test Panel and Enable CW and easure the level. (Coupler 57dbc) cord the measured value for CF 950 MHz -15 dBm. cord the measured value for CF 1450 MHz -15 dBm.							
		ок							

PROCEDURE / REPORT OF TEST Nº 8.2.1								
TEST NAM transmissio	E: T-1 only EMS CW carrier n.	ELEM	IENT UNDER TEST	I: EMS	Serial Nº and/or version	ו:		
PROJEC T: TSGT	TEST MATRIX: 4.5 (FAT)	TEST CONDUCTOR:	TEST CONDUCTOR: QA ENG: CUSTOMER: DATE START:					
STEP		TEST SEQUENCE	I	EXPECTED RESULT	RESULT	REMARKS		
		THALES LMS 11:52:39 Verminal OLGK-T2 Protected Protected B	P. Ma	adems	2) Terminat			
	Establish a test configuration	n and apply on-line test.			N/R			
5.	Check EMSe 1U Modems 1 communicating	is having latest Firmware/SWS	S installed and	Version V1.2.1 with ETX upgrade to V4.3.23				
6.	Check EMSe 1U Modems 2 communicating	is having latest Firmware/SWS	S installed and	Version V1.2.1 with ETX upgrade to V4.3.23				
7.	Check EMSe 1U Modems 3 communicating	is having latest Firmware/SWS	S installed and	Version V1.2.1 with ETX upgrade to V4.3.23				

		PROCE	EDURE / REPORT (DF TEST № 8.2.1		
TEST NAM transmissio	E: T-1 only EMS CW carrier n.	ELEN	IENT UNDER TEST	T: EMS	Serial Nº and/or version	1:
PROJEC T: TSGT	TEST MATRIX: 4.5 (FAT)	TEST CONDUCTOR:	TEST CONDUCTOR: QA ENG:		DATE START:	DATE END:
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS
8.	Check EMSe 1U Modems 4 is having latest Firmware/SWS installed and communicating			Version V1.2.1 with ETX upgrade to V4.3.23		
	Apply 10 MHz reference calibration on 1U Modem#1				ОК	
	Apply 10 MHz reference calibration on 1U Modem#2				ОК	
	Apply 10 MHz reference calibration on 1U Modem#3				ОК	
	Apply 10 MHz reference cali	bration on 1U Modem#4			ОК	
	Select Up-converter A ON-LINE and SSPA A + B ON-LINE. Configure modem EPM, TU1, (EMSe #1) as follow; CW, CF 1200 MHz, Output power -15 dBm. Connect the power meter sensor to LBAND P/P EMSe1 and Enable CW and measure the level.			LBANDTX:-16.8 dBm		EMSe1
 Make a LBAND BNC loop from UPLINK to/DOWNLINK Patch Panel. Record the RX Power Level on the LMS as seen below. 14. Connect the power sensor to X BAND RF test Panel and Enable CW and measure the level. (Coupler 57dbc) Record the measured value for CF 950 MHz -15 dBm. Record the measured value for CF 1450 MHz -15 dBm. Install TX,RX RF Chain for CUs. 			X -BAND TX T-1:+40.0 dBm X- BAND TX T-2:+46.0 dBm			
			ОК			

PROCEDURE / REPORT OF TEST Nº 8.2.1								
TEST NAME: transmission.	T-1 only EMS CW carrier	ELEM	ENT UNDER TEST	: EMS	Serial Nº and/or version:			
PROJEC T: TSGT	TEST MATRIX: 4.5 (FAT)	TEST CONDUCTOR:	TEST CONDUCTOR: QA ENG: CUSTOMER:			DATE END:		
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
		View Terminal Control and Monitoring Ma	P. Modems	Protected Modems Window Image: State of the st	₩ 2] -5]			

PROCEDURE / REPORT OF TEST Nº 8.2.1								
TEST NAM transmissio	E: T-1 only EMS CW carrier n.	ELEN	IENT UNDER TEST	: EMS	Serial Nº and/or version:			
PROJEC	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
1.1301	4.5 (FAT)							
STEP		TEST SEQUENCE			RESULT	REMARKS		
	Select Up-converter A ON-L	INE and SSPA A + B ON-LINE	LBANDTX:-16.8 dBm		EMSe2			
	Configure modem EPM, TU2 Output power	2, (EMSe #2) as follow; CW, C	F 1200 MHz,					
	-15 dBm.							
	Connect the power meter se measure the level.	ensor to LBAND P/P EMSe1 ar	nd Enable CW and					
	Make a LBAND BNC loop fro	om UPLINK to/DOWNLINK Pa	itch Panel.					
	Record the RX Power Level	on the LMS as seen below.		LBAND RX:-17.5 dBm				
14.	Connect the power sensor to	o X BAND RF test Panel and E	nable CW and					
	Record the measured value	for CE 950 MHz -15 dBm		X -BAND TX				
	Record the measured value	for CE 1450 MHz -15 dBm		T-1:+40.0 dBm				
	Install TX.RX RF Chain for 0	CUs.		X- BAND TX				
	,			T-2:+46.0 dBm				
				ок				

PROCEDURE / REPORT OF TEST Nº 8.2.1								
TEST NAME: transmission.	T-1 only EMS CW carrier	ELEM	ENT UNDER TEST	: EMS	Serial Nº and/or version:			
PROJEC T: TSGT	TEST MATRIX: 4.5 (FAT)	TEST CONDUCTOR:	TEST CONDUCTOR: QA ENG: CUSTOMER:			DATE END:		
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
		View Terminal Control and Monitoring Ma	P. Modems	Protected Modems Window Image: State of the st	₩ 2] -5]			

	PROCEDURE / REPORT OF TEST Nº 8.2.1							
TEST NAME: T-1 only EMS CW carrier ELEMENT UNDER TE ELEMENT UNDER TE		IENT UNDER TEST	: EMS	Serial № and/or version:				
	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
1.1561	4.5 (FAT)							
STEP	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS		
	Select Up-converter A ON-L	INE and SSPA A + B ON-LINE	Ξ.	LBANDTX:-16.8 dBm		EMSe3		
	Configure modem EPM, TU3 Output power	3, (EMSe #3) as follow; CW, C	F 1200 MHz,					
	-15 dBm.							
	Connect the power meter sensor to LBAND P/P EMSe1 and Enable CW and measure the level.							
	Make a LBAND BNC loop fro	om UPLINK to/DOWNLINK Pa	atch Panel.	LBAND RX:-17.5 dBm				
	Record the RX Power Level	on the LMS as seen below.						
14.	Connect the power sensor to	X BAND RF test Panel and E	Enable CW and					
	Record the measured value	for CE 050 MHz 15 dBm		X -BAND TX				
	Record the measured value	for CE 1450 MHz -15 dBm		T-1:+40.0 dBm				
	Install TX.RX RF Chain for C	CUs.		X- BAND TX				
	,			T-2:+46.0 dBm				
				ок				

PROCEDURE / REPORT OF TEST Nº 8.2.1								
TEST NAME: transmission.	T-1 only EMS CW carrier	ELEM	ENT UNDER TEST	EMS	Serial Nº and/or version:			
PROJEC T: TSGT	TEST MATRIX: 4.5 (FAT)	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
		Lew Terminal Control and Wontoning Tage Configurations OUX Default 1.00 (Provision OUX11 OUX11 OUX11 OUX11 OUX11 OUX1 OUUX1 OUUX1	P. Modems P. Modems TU 1 OLUX LMS - Carrier wave Tx Power (dBm): Tx Frequency (M Rx Frequency (M	Protected Woderns Window TU 2 oLUX TU 3 oLUX1 Image: State Stat	22 () () ()			

PROCEDURE / REPORT OF TEST Nº 8.2.1								
TEST NAM transmissio	E: T-1 only EMS CW carrier n.	ELEN	IENT UNDER TEST	: EMS	Serial Nº and/or version	ו:		
PROJEC	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
1.1301	4.5 (FAT)							
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
	Select Up-converter A ON-L	INE and SSPA A + B ON-LINE	Ξ.	LBANDTX:-16.8 dBm		EMSe4		
	Configure modem EPM, TU4 Output power	4, (EMSe #4) as follow; CW, C	F 1200 MHz,					
	-15 dBm.							
	Connect the power meter sensor to LBAND P/P EMSe1 and Enable CW and measure the level.							
	Make a LBAND BNC loop fro	om UPLINK to/DOWNLINK Pa	itch Panel.	LBAND RX:-17.5 dBm				
	Record the RX Power Level	on the LMS as seen below.						
14.	Connect the power sensor to	57 X BAND RF test Panel and E	nable CW and					
	Record the measured value	for CF 950 MHz -15 dBm.		X -BAND TX				
	Record the measured value	for CF 1450 MHz -15 dBm.		T-1:+40.0 dBm				
	Install TX, RX RF Chain for	CUs.		X- BAND TX				
				T-2:+46.0 dBm				
				ОК				

PROCEDURE / REPORT OF TEST Nº 8.2.1								
TEST NAME: transmission.	T-1 only EMS CW carrier	ELEM	ENT UNDER TEST	: EMS	Serial Nº and/or version:			
PROJEC T: TSGT	TEST MATRIX: 4.5 (FAT)	TEST CONDUCTOR:	TEST CONDUCTOR: QA ENG: CUSTOMER:			DATE END:		
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
		View Terminal Control and Monitoring Ma	P. Modems	Protected Modems Window Image: State of the st	₩ 2] -5]			

8.2.2 EBEM BER Stability Test per ITU- G.821 Standard

This test requires testing each EBEM modem over a satellite link, using either the modem's internal BER test mode or an external BER test set. The first modem test will be run overnight, and the remaining four modems will be run for 20 minutes.

			PROCEDURE / REPORT O	F TEST № 8.2.2		
TEST NAI stability	ME: BER y Test	EL	EMENT UNDER TEST: Satellite Sys	stem	Serial № and/or version:	
PROJECT: TSGT	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQU		EXPECTED RESULT	RESULT	REMARKS
1.	Obtain satellite Access Authorization to link TSGT with other NATO Terminals and / or a NATO Hub Station over a Multilink. Configure system for T-1or T-2 configuration depends on the power requirements Select BUC A and SSPA A + B. Select LNA A and BDC A. Point the Antenna Subsystem at the Satellite.				ок	
2.	Configure I	EBEM1 per the SAA (SAT Loo	p) and verify the modem is locked.		ОК	
3.	Using the E BER test a detected.	BER Tester in the modem or an nd verify test is free of any erro	n external BER test set, start a ors. Inject 1 Error confirm that it is		ок	
4.	Run the test	st overnight and paste both sci on and the test results below.	een capture of the modem		ок	
			Paste EBEM1 configuration and	BER test results here.		
5.	Configure I	EBEM2 per the SAA (SAT Loo	p) and verify the modem is locked.		OK	
6.	Using the E BER test a detected.	BER Tester in the modem or and the nodem or and the second s	n external BER test set, start a ors. Inject 1 Error confirm that it is		ок	

PROCEDURE / REPORT OF TEST Nº 8.2.2						
TEST NAME: BER stability Test		ELI	EMENT UNDER TEST: Satellite Sys	tem	Serial № and/or version:	
PROJECT:	TEST	TEST TEST CONDUCTOR: QA ENG:		CUSTOMER:	DATE START:	DATE END:
1561						
STEP		TEST SEQU	ENCE	EXPECTED RESULT	RESULT	REMARKS
7.	Run the ter configuration	st for 20 minutes and paste bot on and the test results below.	h screen capture of the modem		ок	
	·		Paste EBEM2 configuration and E	BER test results here.		·
8.	Configure	EBEM3 per the SAA (SAT Loo	p) and verify the modem is locked.		ОК	
9.	Using the BER Tester in the modem or an external BER test set, start a BER test and verify test is free of any errors. Inject 1 Error confirm that it is detected.				ок	
10	Run the test for 20 minutes and paste both screen capture of the modem configuration and the test results below.				ок	
			Paste EBEM3 configuration and I	BER test results here.		
11.	Configure	EBEM4 per the SAA (SAT Loo	p) and verify the modem is locked.		ОК	
12.	Using the BER Tester in the modem or an external BER test set, start a BER test and verify test is free of any errors. Inject 1 Error confirm that it is detected.				ок	
13.	Run the test for 20 minutes and paste both screen capture of the modem configuration and the test results below.				ок	
Paste EBEM4 configuration and BER				3ER test results here.		
14.	Configure EBEM5 per the SAA (SAT Loop) and verify the modem is locked.			ОК		
15.	Using the BER Tester in the modem or an external BER test set, start a BER test and verify test is free of any errors. Inject 1 Error confirm that it is detected.				ок	
16.	Run the test	st for 20 minutes and paste bot on and the test results below.	h screen capture of the modem		ок	

PROCEDURE / REPORT OF TEST Nº 8.2.2						
TEST NA	TEST NAME: BER ELEMENT UNDER TEST: Satellite System stability Test ELEMENT UNDER TEST: Satellite System			stem	Serial Nº and/or version	1:
PROJECT:	TEST	TEST CONDUCTOR: QA ENG:		CUSTOMER:	DATE START:	DATE END:
ISGI						
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS
	·		Paste EBEM5 configuration and	BER test results here.		
	Re-enter the stored "home-location" mark angle recorded during Antenna Control Subsystem tests:		Home Location Mark Angle:			
17.	• T-:	2 ACU (Section 6.1)		T-2 deg.	ОК	
	• T-	1 ACU (Section 6.2)		T-1 deg.	ОК	

8.3 UPS Battery Check

PROCEDURE / REPORT OF TEST Nº 8.3						
TEST NAME: UPS Battery Check		ELEMENT UNDER TEST: UPS			Serial Nº and/or version:	
		TEST CONDUCTOR: QA ENG:		CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS
	The UPS runtime test will be performed with the TSGT configured for the 2.4m and 4.6m RF systems transmitting in phase combined mode and operating within the linear region.					
1.	Point both T-1 and T-2 antennas to cold sky and place both antenna ACU systems in Standby.		ОК	ок		
2.	Verify the T-1 TWT	As are in Standby mode.		OK	ОК	

PROCEDURE / REPORT OF TEST Nº 8.3						
TEST NAME: UPS Battery Check		E	LEMENT UNDER TEST: UF	PS	Serial Nº and/or version	on:
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS
3.	Verify the T-2 SSF	PAs are in Mute mode.		ОК	ОК	
4.	Command both the Maintenance.	e T-2 and T-1 HPA subsystems	to Combined	ОК	ок	
5.	Turn on all ECUs, set target temperature to force two (2) ECUs to cooling mode.			ОК	ок	
6.	Monitor the TSGT AC Power Meter and record kVA.			7.8 kVa	kVa	
7.	Monitor the Inverter SLI50 Controller System Power and record kVA.			2.8 kVa	kVa	
8.	Configure EBEM 1 to Inject -10 dBm, CW, 1200 MHz and patch to the T-2 Uplink.			ОК	ок	
9.	Configure EBEM 2 to Inject -10 dBm, CW, 1200 MHz and patch to the T-1 Uplink.			ОК	ок	
10.	Unmute (Enable) t	the T-2 SSPAs.		ОК	ОК	
11.	While monitoring the output power of the SSPAs by means a ASNMC increase the CW signal level of EBEM 1 until both SSPAs are operating at 50.0 dBm.			50.0 dBm	dBm	
12.	Monitor the TSGT	AC Power Meter and record kV	Α.	11.6 kVa	kVa	
13.	Monitor the Inverte	er SLI50 Controller System Pow	er and record kVA.	6.4 kVa	kVa	
14.	Command both T-	1 TWTAs to Transmit.				
15.	While monitoring the output power of the TWTAs by means a ASNMC increase the CW signal level of EBEM 2 until both TWTAs are operating at 45.0 dBm.		45.0 dBm	dBm		
16.	Monitor the TSGT	AC Power Meter and record kV	A.	16.4 kVa	kVa	

	PROCEDURE / REPORT OF TEST Nº 8.3						
TEST NAME: UPS Battery Check		EI	LEMENT UNDER TEST: UF	2S	Serial № and/or version:		
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:	
STEP	STEP TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
17.	Monitor the Inverte	Monitor the Inverter SLI50 Controller System Power and record kVA.		11.0 kVa	kVa		
18.	UPS Battery Runtime Test						
	1. Open mai	in circuit breaker CB1.			ОК		
	2. Note and	record start time.			Time::		
	 Check the current flow with PowCom. It should indicate that it is flowing <u>OUT</u> of the battery as shown in the screen capture below. 				ок		
	 Monitor battery voltage on the Rectifier Controller and record the time when the battery voltage is reduced to 44.0 VDC. 			VDC			
	5 minutes	elapses before voltage drops, g	go to step 5.				
5. Record UPS battery run time autonomy.			5 Minutes +				
	Note: The minimu	m capability on UPS power is 5	minutes.				



9 ARCHIVE REPORT

Archive this test report when it is complete.

DOCUMENT HISTORY					
REV	DESCRIPTION	DATE	APPROVED		
1	Preliminary Release	14-May-20			
[

ORIGINATOR	DATE					
M. Rekrut				GLOBEC	OMM SYSTEM	s, <i>INC</i> .
ENGINEER	DATE	45 OSER AVENUE				
M. Rekrut				HAUPF	PAUGE, NY 11788 U	SA
APPROVED	DATE	TITLE				
		Level 3B	TSG	T Status C	heck, CSSC a	t FSP
DO NOT SCA WORK FROM	LE DRAWING DIMENSIONS					
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Level 3B TSGT Status Check, CSSC at FSP

DSO TSGT

Revision 1

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ABOUT THIS DOCUMENT

This document describes the DSO TSGT preventive maintenance procedures to be performed by a Level 1 Operator.

CAUTION ICON

A Caution icon in the manual indicates a hazardous situation that if not avoided, may result in injury. A Caution icon may also be used to indicate other unsafe practices or risks of damage to the TSGT equipment.



POTENTIAL HAZARDS AND SAFETY PRECAUTIONS

While all precautions have been taken by Globecomm Systems, Inc to eliminate and identify potential safety hazards in the TSGT System, personnel should exercise caution when installing, operating and servicing the equipment.

Care should be taken to prevent injury from electrical shock, pinch points and RF Radiation. Globecomm Systems, Inc is not liable for any damage or injury arising from a technician's failure to follow instructions contained in this document or his or her failure to exercise due care and caution in the installation, operation and service of the TSGT equipment. Globecomm Systems, Inc shall not be responsible for injury or damage resulting from improper procedures or from the use of improperly trained or inexperienced personnel performing such tasks.

This document is intended as a general guide for trained and qualified personnel who are aware of the dangers of handling potentially hazardous electrical and electronic circuits. This document is not intended to contain a complete statement of all safety precautions that should be observed by personnel in using this or other electronic equipment.

This system is integrated with high power amplifiers of traveling wave tubes and other high power amplifier technology and is capable of transmitting microwave energy at varying power levels. If transmitting microwave power, Globecomm Systems, Inc cautions the end-user to review all applicable local, federal and international regulations and to comply with all such regulations in the operation and maintenance of the integrated system.

The electrical currents and voltages associated with the equipment, whether supplied by Globecomm Systems, Inc or others, are dangerous. Personnel must, at all times, observe safety regulations.

SAFETY GUIDELINES

• Do not remove, short-circuit or tamper with interlock switches on access covers, doors, enclosures, gates, panels or shields.

- Keep away from live circuits.
- Know your equipment and do not take risks.
- Always remove all power to the system prior to working on the antenna, the reflector assembly, the reflector backup assembly or the feed assembly.

RF Radiation Lockout Perimeter

The TSGT antenna radiating surfaces can produce non-ionizing radiation levels more than maximum recommended exposure levels.

To determine the minimum 'safe' distance from the antenna requires calculating the Power Density in the direction of personnel or the object of concern. Minimum information required to calculate the Power Density is the distance to the object, angular offset of the antenna RF bore-sight to the object, and operating power levels. Formulae for calculating Power Density may be found in AECTP 250 Edition 1, Leaflet 258.

A simplified approach to determining safe area boundaries considers a baseline operating condition where only the lower limit of operational elevation angle is required. Baseline operating conditions are established for the T-1 and T-2 configurations as follows;

Configuration	<u>T-1</u>	<u>T-2</u>
Antenna	4.6m	2.4m
Antenna Centerline Height	3.1m	3.3m
HPA Configuration	1:1 Phase	1:1 Phase
	Combined	Combined
Maximum TSGT EIRP	79 dBW	68 dBW
Near Field Length	148m	41m
Distance to Far Field	355m	97m
Max. Power Density Near Field	14 mW/cm ²	19 mW/cm ²
Max. Power Density Far Field	34 mW/cm ²	3 mW/cm ²

The baseline operating configurations result in radiation levels more than maximum recommended exposure levels when in line with the antenna main lobe. The antenna main lobe is a cone shaped projection assumed to have the same dimensions as the antenna main reflector.



Antenna Main Lobe Projection

Due to the directivity of the radiated power a zone perimeter can be established by adhering to a few simple rules.

1. Never operate below a 5° antenna elevation angle

- 2. Always assume maximum transmitter power
- 3. Always verify the main lobe is not in line with personnel or buildings.
- 4. Always consider the main lobe to be twice the diameter of the antenna at distances of twice the antenna diameter
- 5. Always consider the radiation field extends a minimum of 500m
- 6. Always wear your personal Radiation Monitor when working on or around an operating TSGT



TSGT Radiation Zone Perimeter

Antenna Operational Elevation Angle	<u>T-'</u> Minimum S Dimensi	<u>T-1</u> Minimum Safe Area Dimension (m)		<u>T-2</u> Minimum Safe Area Dimension (m)	
()	Length (L)	Width (W)	Length (L)	Width (W)	
5	38	9	14	5	
10	19	9	7	5	
15	12	9	5	5	
20	9	9	4	3	
25	7	5	3	3	
30	6	5	2	3	
35	5	5	2	3	
40	4	5	2	3	
45	3.5	5	2	3	
	TOOT De l'etter	7	·		

TSGT Radiation Zone Perimeter Dimensions

The TSGT setup procedure calls for a "Lockout Perimeter" to be established around the terminal to protect personnel from RF radiation.

RF Radiation Monitor

A personal RF Radiation Monitor is provided with the TSGT and should be worn at all times by any personnel working around a transmitting TSGT.

Emergency Power Off Controls

The TSGT is equipped with Power Emergency Off (EPO) switches at both the TSGT Container and the T-1 Extension Trailer.

One TSGT Container Emergency Power Off button is located on the Power ETB as illustrated below. <u>Depressing this button cuts of all power to the TSGT terminal and should only be used in the event of an emergency</u>.



TSGT Container Power ETB Emergency Power Off

A second TSGT Container Emergency Power Off button is located the Left Side of the TSGT Container as illustrated below. <u>Depressing this button cuts of all power to the TSGT terminal and should only be used in the event of an emergency</u>.



TSGT Container Left Side Emergency Power Off

TSGT Container Left Side Emergency Power Off

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Level 3B TSGT Status Check, CSSC at FSP – 11137-01610-032 Revision 1 viii

A third TSGT Container Emergency Power Off button is located the Right Side of the TSGT Container as illustrated below. Depressing this button cuts of all power to the TSGT terminal and should only be used in the event of an emergency.

TSGT Container Right Side



TSGT Container Right Side Emergency Power Off

The T-1 Extension Trailer is equipped with an Emergency Power Off button located at the front of the Trailer Power Panel and illustrated below. Depressing this button cuts of all power to the T-1 Extension Trailer and should only be used in the event of an emergency.



T-1 Trailer Emergency Power Off

T-1 Extension Trailer Power ETB Emergency Power Off Button

Emergency Power Off Protection Switches

The TSGT is equipped with Power Emergency Off (EPO) protection switches at the TSGT Container. If any of these switches are activated, all power to the TSGT is shut off.

- Dirty Power Panel Plate
- Clean Power Panel Plate
- Dirty Power Vault Access (TSGT Container center aisle)
- Clean Power Vault Access (TSGT Container center aisle)

Safety Procedures

The following safety procedures are listed to remind those performing any work on the antenna system that safety rules must be observed. Failure to observe safety rules may result in serious injury or death. Always work safely and in accordance with established procedures.

- Always wear the RF Radiation Monitor when working on or near a TSGT terminal.
- Care shall be taken in all operations to safeguard other people as well as property and to comply with all local safety procedures as established by the customer's site representative, as well as local building codes and fire protection standards.
- Never make internal adjustments or perform maintenance or service when alone or fatigued.
- Do not stand in the direct path of the feed system when the system is transmitting!
- Do not work on the feed system when the TSGT is transmitting!

WIND SPEED WARNINGS

T-1 4.6m Antenna

The T-1 4.6m antenna should not be deployed in wind speeds more than **10 m/s (36 km/h)**.

The T-1 4.6m antenna can survive in up to **30 m/s (108 km/h)** winds at any position. In winds above **30 m/s (108 km/h)**, the antenna must be stowed to ensure survival.

If wind speeds are below **10 m/s (36 km/h)**, the T-1 4.6m antenna can be stowed per the procedure described in Section **Error! Reference source not found.** of the DSO TSGT O&M manual.

To stow the T-1 4.6m antenna in winds speeds exceeding **10 m/s (36 km/h)**, the antenna must be stowed by an alternate method where the antenna wings are not folded and secured before the reflector is lowered to its stowed position, as described in Section **Error! Reference source not found.** of the DSO TSGT O&M manual.

T-2 2.4m Antenna

The T-2 2.4m antenna should not be deployed in wind speeds more than **33.5 m/s** (120 km/h).

The T-2 2.4m antenna can survive in up to **33.5 m/s (120 km/h)** winds at any position. In winds above **33.5 m/s (120 km/h)**, the antenna must be stowed to ensure survival.

The T-2 4.6m antenna can be stowed per the procedure described on Section 3.4.2 of the DSO TSGT O&M manual.

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3.3 System Power-On and Initial Assessment	
3.4 T-2 System Checks	
3.5 T-1 System Checks	
3.6 UPS Load Test	
4 Sign and Submit Report	

1 LEVEL 3B TSGT STATUS CHECK – CSSC AT FSP

The purpose of this procedure is to check the TSGT status and prepare it for Level 4 PMI at CSSC. The effort is expected to take 2 days and includes:

- Review of recent Level 1 and Level 2 PMI Reports
- TSGT Set-up, Power-on, and Initial Assessment/Status Checks
- Transmit and Receive Gain Checks
- Transmit and Receive Amplitude Response Checks
- T-1 and T-2 Antenna Control System Checks
- Available for packing and shipping and HOTO support, if applicable

1.1 TSGT Training Check

In the space below, please indicate the NCIAA training courses that the Technician(s) performing these procedures has received on the DSO TSGT. Include the name of the Technician(s) and the name and dates of the training course(s).

2 DSO TSGT SAFETY PRECAUTIONS

Before proceeding with this document, read the section on TSGT safety, beginning on page v at the begging of this document.

Personal RF Radiation Meter

Caution!

The Personal RF Radiation Monitor should be worn at all times while working around a transmitting TSGT Antenna.

To configure the Personal RF Radiation Meter:

- 1. Configure the alarm for Vibrate, Alternating or Audio
- 2. Turn ON the RF Radiation Monitor

Note: While using the RF Radiation Monitor, an operator should not allow their person to be between the monitor and the Antenna for extended periods of time as this could decrease the effectiveness of the monitor. The RF Radiation monitor should not be worn under clothing.

3 LEVEL 3B TSGT STATUS CHECK PROCEDURES

This document lists various checks that should be performed on the TSGT terminal before it is returned to CSSC for Level 4 Maintenance.

Specific procedures are not called out for the various checks since the process is performed by a Level 3 technician from the CSSC. It is left to the CSSC technician to determine the test setup and the scope of the checks.

The purpose is to address any obvious problems with the TSGT terminal in advance of its return to CSSC for Level 4 Maintenance. The procedures for the Level 4 Maintenance at CSSC are very detailed.

Note: Reference PMI document 11137-01610-040 - "Level 4 TSGT Maintenance Procedures at CSSC" for more detail regarding specific procedures.

3.1 Review of Maintenance Records

Review the most recent checklists submitted from Level 1 and Level 2.

Step Item

Check (√)

Check (✓)

1. Recent Level 1 Maintenance Records Reviewed

Recent Level 2 Maintenance Records Reviewed
 Recent Level 3A Maintenance Records Reviewed

3.2 Installation / Visual Inspection

Perform the following checks and note any issues in the box at the end of the procedure.

Step Item

- 1. Inspect the T-1 Trailer for obvious problems or issues.
- 2. Inspect the T-1 Antenna and Feed for obvious problems or issues.
- 3. Position Trailer and prepare for deployment.
- 4. Position T-2 Container and prepare for deployment.

RECORD ANY ISSUES HERE

3.3 System Power-On and Initial Assessment

Perform the following steps and note any issues in the box at the end of the procedure.

Step	Item	Check (✔)
1.	Perform Initial Power-On checks.	
2.	Perform EPO checks.	
3.	Position Trailer and prepare for deployment.	
4.	Position T-2 Container and prepare for deployment.	
5.	Power-up and check ECUs are functioning properly.	
6.	Leave all three ECUs powered on.	
7.	Power-up and check the UPS.	
8.	Power-up equipment racks at Clean Power Distribution Panel.	
9.	Power-on all independent units.	

RECORD ANY ISSUES HERE	

3.4 T-2 System Checks

Perform the following checks and note any issues in the box at the end of the procedure.

Step	Item	Check (√)
1.	Sweep both SSPAs and check gains.	
2.	Sweep both T-2 LNAs and check gains.	
3.	Sweep both T-2 BUCs and check BUC A and BUC B gain delta.	
4.	Sweep both T-2 BDCs and check BDC A and BDC B gain delta.	
5.	Check T-2 ACU and PDU operation.	
6.	Check T-2 gearbox and motor operation.	
7.	Check T-2 system with MACS via ASNMC and M&C laptop.	

RECORD ANY ISSUES HERE

3.5 T-1 System Checks

Perform the following checks and note any issues in the box at the end of the procedure.

Step	Item	Check (√)
1.	Sweep both TWTAs and check gains.	
2.	Sweep both T-1 LNAs and check gains.	
3.	Sweep both T-1 BUCs and check BUC A and BUC B gain delta.	
4.	Sweep both T-1 BDCs and check BDC A and BDC B gain delta.	
5.	Check T-1 ACU and PDU Operation.	
6.	Check T-1 Gearbox, Azimuth Brake, and Motor Operation.	
7.	Check T-1 system with MACS via ASNMC and M&C Laptop.	

RECORD ANY ISSUES HERE

3.6 UPS Load Test

Perform a UPS load test and note any issues in the box below.

RECORD ANY ISSUES HERE

4 SIGN AND SUBMIT REPORT

Technicians from CSSC and FSP to sign and date this report.

CSSC Technician

FSP Technician

Submit this report and any additional issues noted to CSSC.

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DOCUMENT HISTORY						
REV	DESCRIPTION	DATE	APPROVED			
1	Preliminary Release	14-May-20				
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ORIGINATOR	DATE					
M. Rekrut		GLOBECOMM SYSTEMS, INC.				S, INC.
ENGINEER	DATE	45 OSER AVENUE				
M. Rekrut		HAUPPAUGE, NY 11788 USA			SA	
APPROVED	DATE	TITLE				
		Level 3C TSGT Handoff, CSSC at FSP/D				/DCM
DO NOT SCALE DRAWING WORK FROM DIMENSIONS						
		CAGE CODE	DWG N	О.		REV
USED OR REPRODUCED IN A METHOD, WITHOUT THE WRITT	Y FORM, BY ANY N AUTHORIZATION	02MQ7		11137-01	610-033	1
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Level 3C TSGT Handoff, CSSC at FSP/DSP

DSO TSGT

Revision 1

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ABOUT THIS DOCUMENT

This document describes the DSO TSGT preventive maintenance procedures to be performed by a Level 1 Operator.

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A simplified approach to determining safe area boundaries considers a baseline operating condition where only the lower limit of operational elevation angle is required. Baseline operating conditions are established for the T-1 and T-2 configurations as follows;

Configuration	<u>T-1</u>	<u>T-2</u>
Antenna	4.6m	2.4m
Antenna Centerline Height	3.1m	3.3m
HPA Configuration	1:1 Phase	1:1 Phase
	Combined	Combined
Maximum TSGT EIRP	79 dBW	68 dBW
Near Field Length	148m	41m
Distance to Far Field	355m	97m
Max. Power Density Near Field	14 mW/cm ²	19 mW/cm ²
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The baseline operating configurations result in radiation levels more than maximum recommended exposure levels when in line with the antenna main lobe. The antenna main lobe is a cone shaped projection assumed to have the same dimensions as the antenna main reflector.



Antenna Main Lobe Projection

Due to the directivity of the radiated power a zone perimeter can be established by adhering to a few simple rules.

1. Never operate below a 5° antenna elevation angle

- 2. Always assume maximum transmitter power
- 3. Always verify the main lobe is not in line with personnel or buildings.
- 4. Always consider the main lobe to be twice the diameter of the antenna at distances of twice the antenna diameter
- 5. Always consider the radiation field extends a minimum of 500m
- 6. Always wear your personal Radiation Monitor when working on or around an operating TSGT



TSGT Radiation Zone Perimeter

Antenna Operational Elevation Angle	<u>T-1</u> Minimum Safe Area Dimension (m)		<u>T-2</u> Minimum Safe Area Dimension (m)	
()	Length (L)	Width (W)	Length (L)	Width (W)
5	38	9	14	5
10	19	9	7	5
15	12	9	5	5
20	9	9	4	3
25	7	5	3	3
30	6	5	2	3
35	5	5	2	3
40	4	5	2	3
45	3.5	5	2	3
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TSGT Radiation Zone Perimeter Dimensions

The TSGT setup procedure calls for a "Lockout Perimeter" to be established around the terminal to protect personnel from RF radiation.

RF Radiation Monitor

A personal RF Radiation Monitor is provided with the TSGT and should be worn at all times by any personnel working around a transmitting TSGT.

Emergency Power Off Controls

The TSGT is equipped with Power Emergency Off (EPO) switches at both the TSGT Container and the T-1 Extension Trailer.

One TSGT Container Emergency Power Off button is located on the Power ETB as illustrated below. <u>Depressing this button cuts of all power to the TSGT terminal and should only be used in the event of an emergency</u>.



TSGT Container Power ETB Emergency Power Off

A second TSGT Container Emergency Power Off button is located the Left Side of the TSGT Container as illustrated below. <u>Depressing this button cuts of all power to the TSGT terminal and should only be used in the event of an emergency</u>.



TSGT Container Left Side Emergency Power Off

TSGT Container Left Side Emergency Power Off

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A third TSGT Container Emergency Power Off button is located the Right Side of the TSGT Container as illustrated below. Depressing this button cuts of all power to the TSGT terminal and should only be used in the event of an emergency.

TSGT Container Right Side



TSGT Container Right Side Emergency Power Off

The T-1 Extension Trailer is equipped with an Emergency Power Off button located at the front of the Trailer Power Panel and illustrated below. Depressing this button cuts of all power to the T-1 Extension Trailer and should only be used in the event of an emergency.



T-1 Trailer Emergency Power Off

T-1 Extension Trailer Power ETB Emergency Power Off Button

Emergency Power Off Protection Switches

The TSGT is equipped with Power Emergency Off (EPO) protection switches at the TSGT Container. If any of these switches are activated, all power to the TSGT is shut off.

- Dirty Power Panel Plate
- Clean Power Panel Plate
- Dirty Power Vault Access (TSGT Container center aisle)
- Clean Power Vault Access (TSGT Container center aisle)

Safety Procedures

The following safety procedures are listed to remind those performing any work on the antenna system that safety rules must be observed. Failure to observe safety rules may result in serious injury or death. Always work safely and in accordance with established procedures.

- Always wear the RF Radiation Monitor when working on or near a TSGT terminal.
- Care shall be taken in all operations to safeguard other people as well as property and to comply with all local safety procedures as established by the customer's site representative, as well as local building codes and fire protection standards.
- Never make internal adjustments or perform maintenance or service when alone or fatigued.
- Do not stand in the direct path of the feed system when the system is transmitting!
- Do not work on the feed system when the TSGT is transmitting!

WIND SPEED WARNINGS

T-1 4.6m Antenna

The T-1 4.6m antenna should not be deployed in wind speeds more than **10 m/s (36 km/h)**.

The T-1 4.6m antenna can survive in up to **30 m/s (108 km/h)** winds at any position. In winds above **30 m/s (108 km/h)**, the antenna must be stowed to ensure survival.

If wind speeds are below **10 m/s (36 km/h)**, the T-1 4.6m antenna can be stowed per the procedure described in Section **Error! Reference source not found.** of the DSO TSGT O&M manual.

To stow the T-1 4.6m antenna in winds speeds exceeding **10 m/s (36 km/h)**, the antenna must be stowed by an alternate method where the antenna wings are not folded and secured before the reflector is lowered to its stowed position, as described in Section **Error! Reference source not found.** of the DSO TSGT O&M manual.

T-2 2.4m Antenna

The T-2 2.4m antenna should not be deployed in wind speeds more than **33.5 m/s** (120 km/h).

The T-2 2.4m antenna can survive in up to **33.5 m/s (120 km/h)** winds at any position. In winds above **33.5 m/s (120 km/h)**, the antenna must be stowed to ensure survival.

The T-2 4.6m antenna can be stowed per the procedure described on Section 3.4.2 of the DSO TSGT O&M manual.

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2	DSC	OTSGT Safety Precautions		1
3	Leve	el 3C TSGT HANDOFF Procedures		2
	3.1	Review of Level 4 Maintenance Records		2
	3.2	Installation / Visual Inspection		2
	3.3	System Power-On and Initial Assessment		3
	3.4	T-2 System Checks		3
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1 LEVEL 3C TSGT HANDOFF – CSSC AT FSP/DCM

The purpose of this procedure is to check the status of a TSGT after its return from Level 4 PMI at CSSC. The effort is expected to take 2 days and includes:

- Review of recent Level 4 PMI Reports
- TSGT Set-up, Power-on, and Initial Assessment/Status Checks
- T-1 and T-2 System Checks

1.1 TSGT Training Check

In the space below, please indicate the NCIAA training courses that the Technician(s) performing these procedures has received on the DSO TSGT. Include the name of the Technician(s) and the name and dates of the training course(s).

2 DSO TSGT SAFETY PRECAUTIONS

Before proceeding with this document, read the section on TSGT safety, beginning on page v at the begging of this document.

Personal RF Radiation Meter



To configure the Personal RF Radiation Meter:

- 1. Configure the alarm for Vibrate, Alternating or Audio
- 2. Turn ON the RF Radiation Monitor

Note: While using the RF Radiation Monitor, an operator should not allow their person to be between the monitor and the Antenna for extended periods of time as this could decrease the effectiveness of the monitor. The RF Radiation monitor should not be worn under clothing.

3 LEVEL 3C TSGT HANDOFF PROCEDURES

This document lists various checks that should be performed on the TSGT terminal after it is returned from Level 4 Maintenance at CSSC.

Specific procedures are not called out for the various checks since the process is performed by a Level 3 technician from the CSSC. It is left to the CSSC technician to determine the test setup and the scope of the checks.

The purpose is for the CSSC to demonstrate to the FSP that the Level 4 Maintenance procedures were performed at CSSC and the terminal is in excellent operating condition.

Note: Reference PMI document 11137-01610-040 - "Level 4 TSGT Maintenance Procedures at CSSC" for more detail regarding specific procedures.

3.1 Review of Level 4 PMI Report

Review the most recent report from Level 4 Maintenance on the TSGT with the FSP technician.

Recent Level 4 Maintenance Report Reviewed _____ check (

Record any known issues with the TSGT after its Level 4 PMI in the box below (known equipment faults, equipment needing special attention...).

RECORD KNOW ISSUES HERE

3.2 Installation / Visual Inspection

Perform the following checks and note any issues in the box at the end of the procedure.

Step	Item	Check (√)
1.	Inspect the T-1 Trailer for obvious problems or issues.	
2.	Inspect the T-1 Antenna and Feed for obvious problems or issues.	
3.	Position Trailer and prepare for deployment.	
4.	Position T-2 Container and prepare for deployment.	

RECORD ANY ISSUES HERE

3.3 System Power-On and Initial Assessment

Perform the following steps and note any issues in the box at the end of the procedure.

Step	Item	Check (✓)
1.	Perform Initial Power-On checks.	
2.	Perform EPO checks.	
3.	Position Trailer and prepare for deployment.	
4.	Position T-2 Container and prepare for deployment.	
5.	Power-up and check ECUs are functioning properly.	
6.	Leave all three ECUs powered on.	
7.	Power-up and check the UPS.	
8.	Power-up equipment racks at Clean Power Distribution Panel.	
9.	Power-on all independent units.	

F	RECORD ANY ISSUES HERE

3.4 T-2 System Checks

Perform the following checks and note any issues in the box at the end of the procedure.

Step	Item	Check (✔)
1.	Check T-2 transmit gain for all 6 BUC/SSPA combinations.	. <u></u>
2.	Check T-2 receive gain for all 4 LNA/BDC combinations.	
3.	Check T-2 system with MACS via ASNMC and M&C laptop.	
4.	Deploy T-2 antenna.	
5.	Check T-2 antenna mark angle.	
6.	Check T-2 ACU and PDU operation.	
7.	Check T-2 gearbox and motor operation.	
8.	Acquire one or more satellites.	
9.	Stow T-2 antenna	

RECORD ANY ISSUES HERE

3.5 T-1 System Checks

Perform the following checks and note any issues in the box at the end of the procedure.

Step	Item	Check (√)
1.	Check T-1 transmit gain for all 6 BUC/TWTA combinations.	
2.	Check T-1 receive gain for all 4 LNA/BDC combinations.	
3.	Check T-1 system with MACS via ASNMC and M&C laptop.	
4.	Deploy T-1 antenna.	
5.	Check T-1 ACU and PDU operation.	
6.	Check T-1 gearbox, azimuth brake, and motor operation.	
7.	Acquire one or more satellites.	
8.	Stow T-1 antenna.	

RECORD ANY ISSUES HERE

4 SIGN AND SUBMIT REPORT

Technicians from CSSC/FSP and DCM to sign and date this report.

CSSC/FSP Technician

DCM Technician

Submit this report and any additional issues to CSSC.

		DOCUMENT HISTORY			
REV	DESCRIPTION	DATE	APPROVED		
1	Preliminary Release	14-May-20			

ORIGINATOR	DATE					
M. Rekrut				GLOBEC	OMM SYSTE	MS, INC.
ENGINEER	DATE	45 OSER AVENUE				
M. Rekrut			HAUPPAUGE, NY 11788 USA			
APPROVED	DATE	TITLE				
		Level 4 Maintenance Procedures at CSSC,				
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Level 4 Maintenance Procedures at CSSC

DSO TSGT

Revision 1

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ABOUT THIS DOCUMENT

This document describes the DSO TSGT preventive maintenance procedures to be performed by a Level 1 Operator.

CAUTION ICON

A Caution icon in the manual indicates a hazardous situation that if not avoided, may result in injury. A Caution icon may also be used to indicate other unsafe practices or risks of damage to the TSGT equipment.



POTENTIAL HAZARDS AND SAFETY PRECAUTIONS

While all precautions have been taken by Globecomm Systems, Inc to eliminate and identify potential safety hazards in the TSGT System, personnel should exercise caution when installing, operating and servicing the equipment.

Care should be taken to prevent injury from electrical shock, pinch points and RF Radiation. Globecomm Systems, Inc is not liable for any damage or injury arising from a technician's failure to follow instructions contained in this document or his or her failure to exercise due care and caution in the installation, operation and service of the TSGT equipment. Globecomm Systems, Inc shall not be responsible for injury or damage resulting from improper procedures or from the use of improperly trained or inexperienced personnel performing such tasks.

This document is intended as a general guide for trained and qualified personnel who are aware of the dangers of handling potentially hazardous electrical and electronic circuits. This document is not intended to contain a complete statement of all safety precautions that should be observed by personnel in using this or other electronic equipment.

This system is integrated with high power amplifiers of traveling wave tubes and other high power amplifier technology and is capable of transmitting microwave energy at varying power levels. If transmitting microwave power, Globecomm Systems, Inc cautions the end-user to review all applicable local, federal and international regulations and to comply with all such regulations in the operation and maintenance of the integrated system.

The electrical currents and voltages associated with the equipment, whether supplied by Globecomm Systems, Inc or others, are dangerous. Personnel must, at all times, observe safety regulations.

SAFETY GUIDELINES

• Do not remove, short-circuit or tamper with interlock switches on access covers, doors, enclosures, gates, panels or shields.

- Keep away from live circuits.
- Know your equipment and do not take risks.
- Always remove all power to the system prior to working on the antenna, the reflector assembly, the reflector backup assembly or the feed assembly.

RF Radiation Lockout Perimeter

The TSGT antenna radiating surfaces can produce non-ionizing radiation levels more than maximum recommended exposure levels.

To determine the minimum 'safe' distance from the antenna requires calculating the Power Density in the direction of personnel or the object of concern. Minimum information required to calculate the Power Density is the distance to the object, angular offset of the antenna RF bore-sight to the object, and operating power levels. Formulae for calculating Power Density may be found in AECTP 250 Edition 1, Leaflet 258.

A simplified approach to determining safe area boundaries considers a baseline operating condition where only the lower limit of operational elevation angle is required. Baseline operating conditions are established for the T-1 and T-2 configurations as follows;

Configuration	<u>T-1</u>	<u>T-2</u>
Antenna	4.6m	2.4m
Antenna Centreline Height	3.1m	3.3m
HPA Configuration	1:1 Phase	1:1 Phase
	Combined	Combined
Maximum TSGT EIRP	79 dBW	68 dBW
Near Field Length	148m	41m
Distance to Far Field	355m	97m
Max. Power Density Near Field	14 mW/cm ²	19 mW/cm ²
Max. Power Density Far Field	34 mW/cm ²	3 mW/cm ²

The baseline operating configurations result in radiation levels more than maximum recommended exposure levels when in line with the antenna main lobe. The antenna main lobe is a cone shaped projection assumed to have the same dimensions as the antenna main reflector.



Antenna Main Lobe Projection

Due to the directivity of the radiated power a zone perimeter can be established by adhering to a few simple rules.

1. Never operate below a 5° antenna elevation angle

- 2. Always assume maximum transmitter power
- 3. Always verify the main lobe is not in line with personnel or buildings.
- 4. Always consider the main lobe to be twice the diameter of the antenna at distances of twice the antenna diameter
- 5. Always consider the radiation field extends a minimum of 500m
- 6. Always wear your personal Radiation Monitor when working on or around an operating TSGT



TSGT Radiation Zone Perimeter

Antenna Operational Elevation Angle	<u>T-'</u> Minimum S Dimensi	<u>1</u> Safe Area ion (m)	<u>T-2</u> Minimum Safe Area Dimension (m)		
()	Length (L)	Width (W)	Length (L)	Width (W)	
5	38	9	14	5	
10	19	9	7	5	
15	12	9	5	5	
20	9	9	4	3	
25	7	5	3	3	
30	6	5	2	3	
35	5	5	2	3	
40	4	5	2	3	
45	3.5	5	2	3	
	TOOT De l'etter	7	·		

TSGT Radiation Zone Perimeter Dimensions

The TSGT setup procedure calls for a "Lockout Perimeter" to be established around the terminal to protect personnel from RF radiation.

RF Radiation Monitor

A personal RF Radiation Monitor is provided with the TSGT and should be worn at all times by any personnel working around a transmitting TSGT.

Emergency Power Off Controls

The TSGT is equipped with Power Emergency Off (EPO) switches at both the TSGT Container and the T-1 Extension Trailer.

One TSGT Container Emergency Power Off button is located on the Power ETB as illustrated below. <u>Depressing this button cuts of all power to the TSGT terminal and should only be used in the event of an emergency</u>.



TSGT Container Power ETB Emergency Power Off

A second TSGT Container Emergency Power Off button is located the Left Side of the TSGT Container as illustrated below. <u>Depressing this button cuts of all power to the TSGT terminal and should only be used in the event of an emergency</u>.



TSGT Container Left Side Emergency Power Off

TSGT Container Left Side Emergency Power Off

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A third TSGT Container Emergency Power Off button is located the Right Side of the TSGT Container as illustrated below. <u>Depressing this button cuts of all power to the TSGT terminal and should only be used in the event of an emergency</u>.

TSGT Container Right Side



TSGT Container Right Side Emergency Power Off

The T-1 Extension Trailer is equipped with an Emergency Power Off button located at the front of the Trailer Power Panel and illustrated below. <u>Depressing this button cuts</u> of all power to the T-1 Extension Trailer and should only be used in the event of an <u>emergency</u>.



T-1 Trailer Emergency Power Off

T-1 Extension Trailer Power ETB Emergency Power Off Button

Emergency Power Off Protection Switches

The TSGT is equipped with Power Emergency Off (EPO) protection switches at the TSGT Container. If any of these switches are activated, all power to the TSGT is shut off.

- Dirty Power Panel Plate
- Clean Power Panel Plate
- Dirty Power Vault Access (TSGT Container centre aisle)
- Clean Power Vault Access (TSGT Container centre aisle)

Safety Procedures

The following safety procedures are listed to remind those performing any work on the antenna system that safety rules must be observed. Failure to observe safety rules may result in serious injury or death. Always work safely and in accordance with established procedures.

- Always wear the RF Radiation Monitor when working on or near a TSGT terminal.
- Care shall be taken in all operations to safeguard other people as well as property and to comply with all local safety procedures as established by the customer's site representative, as well as local building codes and fire protection standards.
- Never make internal adjustments or perform maintenance or service when alone or fatigued.
- Do not stand in the direct path of the feed system when the system is transmitting!
- Do not work on the feed system when the TSGT is transmitting!

WIND SPEED WARNINGS

T-1 4.6m Antenna

The T-1 4.6m antenna should not be deployed in wind speeds more than **10 m/s (36 km/h)**.

The T-1 4.6m antenna can survive in up to **30 m/s (108 km/h)** winds at any position. In winds above **30 m/s (108 km/h)**, the antenna must be stowed to ensure survival.

If wind speeds are below **10 m/s (36 km/h)**, the T-1 4.6m antenna can be stowed per the procedure described in Section **Error! Reference source not found.** of the DSO TSGT O&M manual.

To stow the T-1 4.6m antenna in winds speeds exceeding **10 m/s (36 km/h)**, the antenna must be stowed by an alternate method where the antenna wings are not folded and secured before the reflector is lowered to its stowed position, as described in Section **Error! Reference source not found.** of the DSO TSGT O&M manual.

T-2 2.4m Antenna

The T-2 2.4m antenna should not be deployed in wind speeds more than **33.5 m/s** (120 km/h).

The T-2 2.4m antenna can survive in up to **33.5 m/s (120 km/h)** winds at any position. In winds above **33.5 m/s (120 km/h)**, the antenna must be stowed to ensure survival.

The T-2 4.6m antenna can be stowed per the procedure described on Section 3.4.2 of the DSO TSGT O&M manual.

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1 LEVEL 4 TSGT MAINTENANCE AT CSSC

Level 4 TSGT Maintenance is the preventive maintenance to be performed every 2 years at the CSSC, including:

- Review of Level 1, 2, 3A, and 3B Maintenance Records
- System Set-Up and Power-Up
- Antenna Control Subsystem Tests
- Measurements and Calibrations
 - RF Monitor/Test Panel
 - Tx and Rx Frequency Accuracy
 - Tx Levels and Phase Alignment
 - o Tx Amplitude Response and Slope Equalizer Adjustment
 - o Rx Chain Level Alignment
 - Rx Amplitude Response
- Functionality Checks

1.1 TSGT Training Check

In the space below, please indicate the NCIAA training courses that the Technician(s) performing these procedures has received on the DSO TSGT. Include the name of the Technician(s) and the name and dates of the training course(s).

NATO UNCLASSIFIED 2 DSO TSGT SAFETY PRECAUTIONS

Before proceeding with this document, read the section on TSGT safety, beginning on page v at the begging of this document.

Personal RF Radiation Meter



To configure the Personal RF Radiation Meter:

- 1. Configure the alarm for Vibrate, Alternating or Audio
- 2. Turn ON the RF Radiation Monitor

Note: While using the RF Radiation Monitor, an operator should not allow their person to be between the monitor and the Antenna for extended periods of time as this could decrease the effectiveness of the monitor. The RF Radiation monitor should not be worn under clothing.

3 **REFERENCED DOCUMENTS**

The DSO TSGT O&M Manuals are good references to support the procedures in this document.

- 11137-01604-001, Operation and Maintenance (O&M) Manual, TSGT, DAC DSO, Volume 1, 2, and 3.
- 11137-01604-002, Operation and Maintenance (O&M) Manual, TSGT, DCIS DSO, Volume 1, 2, and 3.

4 **REVIEW OF TSGT MAINTENANCE RECORDS**

Maintenance records should have been submitted for TSGT Level 1, Level 2, and Level 3 maintenance during the past two years. Confirm that these records have been received and reviewed.

Confirm receipt and review of:

- Recent Level 1 Maintenance Records: _____check (✓)
- Recent Level 2 Maintenance Records: _____check (✓)
- Recent Level 3A at FSP Maintenance Records: _____check (✓)
- Recent Level 3B CSSC at FSP Maintenance Records : ______check (✓)

5 SYSTEM SET-UP AND POWER-UP

5.1 Installation / Visual Inspection

PROCEDURE / REPORT OF TEST № 5.1							
TEST NAME: Installation / Visual Inspection		ELEMENT UNDER TEST: COMPLETE SYSTEM			Serial Nº and/or version	ו:	
PROJECT: TSGT-DSO	TEST MATRIX: TEST CONDUCTOR: QA ENG:		CUSTOMER:	DATE START:	DATE END:		
NUMBER		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS	
	T-1 Trailer C	Checks Before Disconnectir	ng from AMV				
1.	Check Trailer	Brakes and operation.		ОК	ОК		
2.	Check Trailer Lights.			ОК	ОК		
	T-1 Trailer a	nd Antenna Inspection					
1.	Inspect Trailer Inform metal v	for physical damage, punctures vorkshop on action items if applie	, bodywork. cable	ОК	ОК		
2.	Check T-1 antenna for wear and tear, corrosion, and painting removal available.			ОК	ОК		
3.	Check Transp	ort support Z braces and tie-dow	n straps.	ОК	ОК		
4.	Check Air Sus	pension valve system and Air cu	shions operation.	ОК	ОК		
5.	Check Trailer feet and support pins are in place and working properly.			ОК	ОК		
6.	Check Antenna reflector EL Transport support bar and switch operation and lubrication.			ОК	ОК		
7.	Check EL Motor Transport support bar and switch operation.			ОК	ОК		
8.	Check Feedbo	oom clamps and pads are in goo	d condition.	ОК	ОК		

			PROCEDURE / REPORT C	DF TEST № 5.1		
TEST NAME: Installation / Visual Inspection		ELEMEN	ELEMENT UNDER TEST: COMPLETE SYSTEM			ו:
PROJECT: TSGT-DSO	TEST MATRIX: TEST CONDUCTOR: QA ENG:		CUSTOMER:	DATE START:	DATE END:	
NUMBER		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS
9.	Check antenn	a feed is placing on stow bracke	ts properly.	ОК	ОК	
10.	Check antenn maintained, sa mechanism w Check in the L when switch a	a Stow Bracket is in good condit afe and lubricated properly. Swit orking properly. .imit Switch Logic Box that the S ictuated.	ion pins and joints are ch is functional and locking TOW BRACKET LED is OFF	ОК	ок	
11.	Check Antenn condition and	a Stow bracket, Velocity Switch working properly.	ı, pads and spring are in good	ОК	ок ок	
12.	Check Antenna Feed Waveguide Assembly connections are in good condition, tight and free of corrosion.			ОК	ОК	
	T-1 Trailer F	Positioning				
1.	Position Traile	er.		ОК	ОК	
2.	Install support	feet.		ОК	ОК	
3.	Level Trailer.			ОК	ОК	
4.	Inspect power and signal ETB.			ОК	ОК	
5.	Install and inspect grounding and lightning rod connectivity.			ОК	ок	
	T-1 Trailer F	Prepare for Deployment				
1.	Deploy outrigg	gers and level Trailer		ОК	ОК	

PROCEDURE / REPORT OF TEST Nº 5.1							
TEST NAME: Installation / ELEMENT UNDER TEST: COMPLET Visual Inspection Visual Inspection		T UNDER TEST: COMPLETE S	SYSTEM	Serial Nº and/or version:			
PROJECT: TSGT-DSO	TEST MATRIX:	TEST TEST CONDUCTOR: QA ENG:		CUSTOMER:	DATE START:	DATE END:	
NUMBER		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS	
2.	Remove AZ a	nd EL stow bars		ОК	ОК		
3.	Unclamp feed	boom		ОК	ОК		
4	Remove the s	tow bracket safety lanyards		ОК	ОК		
5.	Remove X/Z b	oraces		ОК	ОК		
	T-2 Contain	er Positioning					
1.	Position Conta	ainer.		ОК	ОК		
2.	Remove top cover.			ОК	ОК		
3.	Unclamp feed	boom.		ОК	ОК		
4.	Unlock all doo	ors.		ОК	ОК		
5.	Remove and i	nspect lifting jacks.		ОК	ОК		
6.	Install lifting ja	icks and level Container.		ОК	ОК		
7.	Install groundi	ing and inspect grounding and lig	phtning rod connectivity.	ОК	ОК		
8.	GPFU Carbon and HEPA filters should be replaced every two years. Check them and replace if necessary.			ОК	ок		
	T-2 Contain	er Prepare for Deployment					
1.	Inspect power for damaged/	and signal ETB and T-1 power oose/incomplete connectors, du	and signal wiring harnesses st caps, water tightness etc	ОК	ОК		

PROCEDURE / REPORT OF TEST Nº 5.1							
TEST NAME: Installation / Visual Inspection ELEMENT UNDER TEST: COMPLETE S		SYSTEM Serial Nº and/or version:		1:			
PROJECT: TSGT-DSO	TEST MATRIX:	ST TEST CONDUCTOR: QA ENG:		CUSTOMER:	DATE START:	DATE END:	
NUMBER		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS	
2.	Connect T-2 power and signal wiring harness to the Container and the Trailer.			ОК	ок		
3.	Install and connect the weather mast assembly on the Container.			ОК	ОК		
4.	Inspect Conta bodywork, we Inform metal v	iner for physical damage, punctu ather seals, RF shielding. workshop on action items if applic	ires, doors, handles, cable	ОК	ок		
5.	Check Fibre F	Patch Panel and fibre connectors		ОК	ОК		
6.	 Remove and submit for calibration: FO reels Power meter and power sensor Spectrum analyser DVM Attenuators (3, 6, 10 and 20 dB) WAN Tester Personal radiation meter 			ОК	ок		

5.2 System Power-On and Initial Assessment

PROCEDURE / REPORT OF TEST Nº 5.2							
TEST NAME: Power-On and Initial Assessment ELEMENT UNDER TEST: COMPLETE SY		SYSTEM Serial Nº and/or version:		n:			
PROJECT: TSGT-	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:	
030							
NUMBER		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS	
	Pre-Power o	on Checks					
	Confirm all EP	O Switches are not engaged:					
	At Co	ontainer Power ETB			ОК		
1.	At left	t side of Container		OK	OK		
	At rig	ht side of Container			OK		
	At Tra	ailer ETB			UK		
2.	Confirm all CB in the OFF pos	is located in the Clean and Dirty sition.	Power Distribution Panels are	OFF	ок		
3.	Confirm all Inv	erter Module CBs are ON.		ON	ОК		
4.	Confirm all CB	s on the Summing and Distributi	on Assembly are ON	ON	ОК		
	System Initia	al Power-On Checks					
1.	Connect MAIN Main Power In	I POWER from the PGS or Comr put on the Power ETB.	mercial Power socket to the	ОК	ок		
2.	Close CB25 ar	nd CB32 at the Clean Power Dis	tribution Panel.	OK	ОК		
3.	Close CB1 at t displayed at th Panel is within	the Dirty Power Distribution Pane le AC Power Meter located in the the range 360 – 440VAC (400V	el. Verify that that the voltage Dirty Power Distribution AC ± 10%)	400VAC ±10%	ок		

PROCEDURE / REPORT OF TEST Nº 5.2							
TEST NAME: Power-On and Initial Assessment ELEMENT UNDER TEST: COMPLETE S'		SYSTEM Serial Nº and/or version:		ו:			
PROJECT: TSGT-	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:	
DSO							
NUMBER		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS	
4.	Record the readings at the AC Power Meter			3Phase Voltage: VAVG 3Phase Current: IAVG 3Phase Power: KW 3Phase Frequency: Hz.			
	EPO Checks	3					
1.	Engage the EPO Switch located on the PETB and confirm the following: CB1 at Dirty Power Distribution Panel trips 48VDC EPO Switch in LVDS assembly at rear of UPS opens			ОК ОК	ок ок		
2.	Disengage the EPO Switch at the Power ETB and restore CB1 to apply power to system.			ок	ок		
3.	 Engage the EPO Switch located on the Container left side and confirm the following: CB1 at Dirty Power Distribution Panel trips 48VDC EPO Switch in LVDS assembly at rear of UPS opens 			ОК ОК	ОК ОК		
4.	to apply power	to system.	the Container and restore CB1	OK	ОК		
			PROCEDURE / REPORT O	F TEST № 5.2			
--------------------------	---	--	--	-----------------	--------------------------	-----------	
TEST NAM and Initial	ME: Power-On Assessment	ELEMEN	T UNDER TEST: COMPLETE S	SYSTEM	Serial Nº and/or version	n:	
PROJECT: TSGT- DSO	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:	
NUMBER		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS	
5.	 5. Engage the EPO Switch located on the Container right side and confirm the following: CB1 at Dirty Power Distribution Panel trips 48VDC EPO Switch in LVDS assembly at rear of UPS opens 				ок ок		
6.	Disengage the CB1 to apply p	EPO Switch on the right side of power to system.	the Container and restore	ОК	ок		
7.	Close CB9 on the Dirty Power Distribution Panel to apply mains power to the Trailer.			ОК	ок		
8.	Engage the EF	PO Switch on the Trailer.		OK	ОК		
9.	Confirm that C	B1 at the Trailer trips		OK	ОК		
10.	Disengage the	EPO Switch at the Trailer and c	lose CB1.	ОК	ок		
	Power-Up ar	nd Check the ECUs					
1.	Power-up ECL that will trigger	J A, set it to AUTO mode and se r heating (above ambient temper	t its temperature to a setting ature by at least 4 degrees).	ОК	ок		
2.	Confirm that E	CU A starts heating and is funct	oning properly.	ОК	ОК		
3.	Set ECU A temperature to a setting that will trigger cooling (below ambient temperature by at least 4 degrees).			ОК	ок		
4.	Confirm that E	CU A starts cooling and is functi	oning properly.	ОК	ОК		
5.	Set ECU A ten	nperature to +25 degrees.		ОК	ОК		
6.	Power-down E	CU A.		ОК	ОК		

			PROCEDURE / REPORT C	F TEST № 5.2			
TEST NAM and Initial	ME: Power-On Assessment	ELEMEN	T UNDER TEST: COMPLETE	SYSTEM	Serial № and/or version:		
PROJECT: TSGT- DSO	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:	
NUMBER		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS	
7.	Power-up ECU B, set it to AUTO mode and set its temperature to a setting that will trigger heating (above ambient temperature by at least 4 degrees).			ОК	ОК		
8.	Confirm that E	CU B starts heating and is funct	ioning properly.	ОК	ОК		
9.	Set ECU B ten temperature by	nperature to a setting that will trig y at least 4 degrees).	gger cooling (below ambient	ОК	ок		
10.	Confirm that E	CU B starts cooling and is functi	oning properly.	ОК	ОК		
11.	Set ECU B temperature to +25 degrees.			ОК	ОК		
12.	Power-down E	CU B.		ОК	ОК		
13.	Power-up ECL that will trigger	J C, set it to AUTO mode and se heating (above ambient temper	t its temperature to a setting ature by at least 4 degrees).	ОК	ок		
14.	Confirm that E	CU C starts heating and is funct	ioning properly.	ОК	ОК		
15.	Set ECU C ten temperature by	nperature to a setting that will trig y at least 4 degrees).	gger cooling (below ambient	ОК	ок		
16.	Confirm that E	CU C starts cooling and is functi	ioning properly.	ОК	ОК		
17.	Set ECU C ter	nperature to +25 degrees.		ОК	ОК		
18.	Power-down E	CU C.		ОК	ОК		
19.	Power-up any two ECUs.			ОК	ОК		

	PROCEDURE / REPORT OF TEST Nº 5.2									
TEST NAM and Initial	TEST NAME: Power-On and Initial Assessment ELEMENT UNDER TEST: COMPLETE			SYSTEM Serial Nº and/or version:		::				
PROJECT: TSGT-	JECT: TEST GT- MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER: DATE START:		DATE END:				
DSO										
NUMBER		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS				
	Power-Up ar	nd Check the UPS								
1.	At the Clean P one-by-one wh (Faulty rectifie	Yower Distribution Panel, switch (nile monitoring the output voltage rs tend to "pull down" the output	DN rectifiers 1-7 (at CB2-CB8) at the Rectifier Controller voltage).	54.4 VDC	Voltage:VDC					
2.	Confirm Inverte	ers are powered-on and are not	displaying any faults.	ОК	ОК					
3.	With a (maintenance) laptop with PowCom installed, check if UPS is configured as shown in the PowCom screen captures below. Correct the settings as necessary.			ОК	ок					

			PROCEDURE / REPO	ORT O	TEST № 5.2				
TEST NAM and Initial	ME: Power-On Assessment	ELEMEN	UNDER TEST: COMPL	LETE S	YSTEM		Serial Nº and/or version:		
PROJECT: TSGT- DSO	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:		CUSTOMER: DATE S		DATE STA	RT:	DATE END:
NUMBER		TEST SEQUENCI			EXPECTE	D RESULT	RESULT	F	REMARKS
🖪. Set data		ten ing		🔄, Set d	ata	the last the			
Set U1-U4: Norma Set U1-U4: Norma Set Set Set Set Set Set Set Set	Adjust limits	Battery settings V 54.5 V 56.0 44.0 45.0 46.0 47.5 48.0 49.0 40.0 40.0 40.0	Custom Boost	Bat A No. 1 Bat C	Adjust limits	Boost limits Boost limits Boost time: hour Boost interval:week Boost factor: t1 limit: V t2 limit: V t2 limit: V t2 limit: V Temperature compensa ⊽ Temperature co Temperature	Battery settings	Short Interval E Short Interval E Frequency (d Length (min) Deviation (%) Battery curren Fattery curren System Curren System Curren	ays): 1 ays): 1 : 1 : 30 t limit 40.0 t Limit 0
	Save/Load Setup				Save/Loa	d Setup			

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	PROCEDURE / REPORT OF TEST Nº 5.2									
TEST NAM and Initial	ME: Power-On I Assessment	ELEMEN	T UNDER TEST: COMPLETE	SYSTEM	Serial № and/or version:					
PROJECT: TSGT- DSO	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
NUMBER		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS				
	Power-Up Equipment Racks									
1.	 Turn on Clean Power Distribution Panel circuit breakers to apply power to the equipment racks. Verify that power has been applied to all racks. CB15 (Right R1/R2) CB16 (Right R3/R4) CB17 (Left R5/R6) CB20 (Right R1) CB21 (Right R2/R3) CB22 (Right (R4) CB23 (Left R5) CB24 (Left R6/R7) 			ОК	ок					
2.	Power ON all i initial power O	ndependent units by switching th N status.	nem ON and check all having							
3.	Boot T-1 ACU	for T-1 Operation		Boot sequence for T-1	ОК					
4.	Boot T-2 ACU	for T-2 Operation		Boot sequence for T-2	ОК					
5.	T-2 PDU			Initial power up	ОК					
6.	EMS SERVER COMPUTER LMCa			EMS GUI operation Log GUI Revision. REV.2.1.12	ок ок					

PROCEDURE / REPORT OF TEST Nº 5.2									
TEST NAM and Initial	ME: Power-On I Assessment	ELEMEN"	TUNDER TEST: COMPLETE	SYSTEM	Serial № and/or version:				
PROJECT: TSGT- DSO	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
NUMBER		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS			
7.	EMSe 1 MODEM			Booting Modems without any alarm	ок				
8.	EMSe 2 MODEM			Booting Modems without any alarm	ок				
9.	EMSe 3 MODEM			Booting Modems without any alarm	ок				
10.	EMSe 4 MODEM			Booting Modems without any alarm	ок				
				Windows Win7 prof. operating system starts	ок				
11.	ASNMC LCAm	n SERVER COMPUTER		ASNMC GUI Interface starts. ASNMC VER.1.2.1 iDirect GUI access	ок ок				
				Windows Win7 prof. operating system starts	ок				
12.	ASNMC DWS	CLIENT COMPUTER		ASNMC GUI Interface starts. ASNMC VER.1.2.1	ок ок				
13					OK				
17.									
15				Initial Power up	OK				
16.	ASNMC SWIT	CH		Initial Power up	ок				

	PROCEDURE / REPORT OF TEST Nº 5.2									
TEST NAM and Initial	IE: Power-On Assessment	ELEMEN"	T UNDER TEST: COMPLETE	SYSTEM	STEM Serial Nº and/or version:					
PROJECT: TSGT-	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
DSO										
NUMBER		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS				
17.	EBEM MODEM#1			Initial power up Check FW version Rev. 02.03.02	ок					
18.	EBEM MODEM#2			Initial Power up Check FW version Rev. 02.03.02	ок					
19.	EBEM MODEM#3			Initial Power up Check FW version Rev. 02.03.02	ок					
20.	EBEM MODEN	Л#4		Initial Power up Check FW version Rev. 02.03.02	ок					
21.	EBEM MODEN	М#5		Initial Power up Check FW version Rev. 02.03.02	ок					
22.	LINE AMPLIFI	ERS		Initial Power up	ОК					
23.	NETCLOCK T	FRS #1		Initial Power up	ОК					
24.	NETCLOCK T	FRS #2		Initial Power up	ОК					
25.	SPECTRA TFI	RS DISTRIBUTION AMPLIFIER	1	Initial Power up	ОК					
26.	SPECTRA TFI	RS DISTRIBUTION AMPLIFIER	2	Initial Power up	ок					
27.	GPS ANTENN	Α		Initial Power up	ОК					

	PROCEDURE / REPORT OF TEST Nº 5.2									
TEST NAM and Initial	IE: Power-On Assessment	ELEMEN	I UNDER TEST: COMPLETE	SYSTEM	Serial Nº and/or version	1:				
PROJECT: TSGT-	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
DSO										
NUMBER		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS				
28.	(On DAC 1-4) DXC #1 & FO-MICE EQUIPMENT			Initial Power up	ОК					
29.	(On DAC 1-4) DXC #2 & FO-MICE EQUIPMENT			Initial Power up	ОК					
30.	(On DCIS & DCAOC) FDMA ROUTER #1			Initial Power up	ОК					
31.	(On DCIS & DCAOC) FDMA Switch #1			Initial Power up	ок					
32.	(On DCIS & DO EMS ROUTER	CAOC) X #2		Initial Power up	ОК					
33.	(On DCIS & DO EMS Switch #2	CAOC) 2		Initial Power up	ОК					
34.	ORION SYSTE AMP#1 16 PO	EM MANAGEMNET SUBSYSTE RT	Μ	Initial Power up	ок					
35.	ORIONSYSTE	M MANAGEMNET SUBSYSTEN	И	Initial Power up	ок					
36.	BUC A (BLOC	K UP CONVERTER) for T-1		Initial Power up	ОК					
37.	BUC SWITCH	ING UNIT for T-1		Initial Power up	ОК					
38.	BUC B (BLOC	K UP CONVERTER) for T-1		Initial Power up	ОК					
39.	BUC A (BLOC	BUC A (BLOCK UP CONVERTER) for T-2		Initial Power up	ОК					
40.	BUC SWITCH	ING UNIT for T-2		Initial Power up	ОК					

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	PROCEDURE / REPORT OF TEST Nº 5.2									
TEST NAM and Initial	ME: Power-On Assessment	ELEMENT	UNDER TEST: COMPLETE	SYSTEM	Serial Nº and/or version:					
PROJECT: TSGT-	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
DSO										
NUMBER		TEST SEQUENCE	Ξ	EXPECTED RESULT	RESULT	REMARKS				
41.	BUC B (BLOC	K UP CONVERTER) for T-2		Initial Power up	ОК					
42.	BDC A (BOCK	COWN CONVERTER) for T-1		Initial Power up	ОК					
43.	BDC SWITCH	ING UNIT for T-1		Initial Power up	ОК					
44.	BDC B (BOCK DOWN CONVERTER) for T-1			Initial Power up	ОК					
45.	BDC A (BOCK DOWN CONVERTER) for T-2			Initial Power up	ОК					
46.	BDC SWITCHING UNIT for T-2			Initial Power up	ОК					
47.	BDC B (BOCK DOWN CONVERTER) for T-2			Initial Power up	ОК					
48.	UPLINK EQUA	ALIZER T-1		Initial Power up	ОК					
49.	UPLINK EQUA	ALIZER T-2		Initial Power up	ОК					
50.	SSPA SUBSY	STEM #		Initial Power up	ОК					
51.	SSPA #A			Initial Power up	ОК					
52.	SSPA #B			Initial Power up	ОК					
53.	LNA SUBSYS	TEM		Initial Power up	ОК					
54.	LNA #A			Initial Power up	ОК					
55.	LNA #B			Initial Power up	ОК					
56.	ANTI_ICING S	SYSTEM		Initial Power up	ОК					
57.	DEHYDRATO	R		<10%	%					
	Check duty cy	cle and operation of Dehydrator of	on ASNMC		//					

	PROCEDURE / REPORT OF TEST Nº 5.2								
TEST NAM and Initial	IE: Power-On Assessment	ELEMEN	T UNDER TEST: COMPLETE	SYSTEM	Serial Nº and/or versior	1:			
PROJECT:	TEST	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
DSO									
NUMBER	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS			
59	CONTAINER A	AND BATTERY TEMP			Container: °C				
50.	Check Contain	er temperature operation on ASI	NMC.		Battery: °C				
59.	Confirm that the weather information at the ASNMC is accurate.			Correct weather	ОК				
60.	MISC. ALARMS T-2			Initial Power up	ОК				
61.	PGS (POWER	GENERATION SYSTEM) SUB	SYSTEM	Initial Power up	ОК				
62.	T-1 PDU			Initial Power up	ОК				
63.	T-1 PMU			Initial Power up	ОК				
64.	T-1 HPA SUBS	SYSTEM		Initial Power up	ОК				
65.	HPA #A			Initial Power up	ОК				
66.	HPA #B			Initial Power up	ОК				
67.	T-1 LNA SUBSYSTEM			Initial Power up	ОК				
68.	LNA #A			Initial Power up	ОК				
69.	LNA #B			Initial Power up	ОК				

6 ANTENNA CONTROL SUBSYSTEM TESTS

6.1 T-2 Antenna and Antenna Control System

			PROCEDURE / REPOR	T OF TEST № 6.1		
TEST NAM and Antenn	ME: T-2 Antenna na Control System	ELEMEN	T UNDER TEST: T-2 Anten	na Subsystem	stem Serial Nº and/or version:	
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS
1.	T-2 Antenna II Check PDU for I If not, then open If necessary, rug	abel indicating that it has been PDU to check. See photo to t ggedize it then place label on F	ruggedized. ne right. DU.		ок	

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PROCEDURE / REPORT OF TEST Nº 6.1									
TEST NAI and Antenr	ME: T-2 Antenna na Control System	ELEMENT U	JNDER TEST: T-2 Antenna	Subsystem	ubsystem Serial Nº and/or version:				
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS			
2.	Check antenna F	Check antenna Feed Membrane and Air leakage			ок				
3.	Check Azimuth S MAXIMUM 1" STACK EXPAN ELC	Steel Cables tension.	(2.6 cm) (factory setup)	<u>Check</u> Cable #1 Cable #2 Cable #3 Cable #4					
4.	Check Elevation Not more than 1	Steel Cables tension on the Rigl .00 +0.32". See photo above.	ht-hand side	2.6 cm (factory setup)	Check Cable #1 Cable #2 Cable #3 Cable #3 Cable #4 Cable #5 Cable #6				

			PROCEDURE / REPORT O	DF TEST № 6.1			
TEST NAM and Antenn	ME: T-2 Antenna a Control System	ELEMEN	T UNDER TEST: T-2 Antenna	Subsystem	Serial Nº and/or version	Serial Nº and/or version:	
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:	
STEP		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS	
5.	Check Elevation Steel Cables tension and on the Left-hand side. See photo above			(2.6 cm) (factory setup)	Check Cable #1 Cable #2 Cable #3 Cable #4 Cable #4 Cable #5 Cable #6		
6.	Inspect Azimuth and EI gear boxes for leakage.			ОК	ОК		
7.	Check Elevation	Hand Crank operation is smo	oth and quiet.	ОК	ОК		
8.	Check Azimuth I	Hand Crank operation is smoo	th and quiet.	ОК	ОК		
9.	Check Elevation	pivot bearings.		ОК	ОК		
10.	Check Azimuth	bearing operation.		ОК	ОК		
11.	Check: All visible hardware Cable harness Feed boom struts Feed pallet struts Ferrous metal surfaces Painting, cracks and rusting Waveguide connections and support brackets Antenna surface		ОК	ОК ОК ОК ОК ОК ОК ОК			

PROCEDURE / REPORT OF TEST Nº 6.1								
TEST NAM and Antenna	IE: T-2 Antenna a Control System	ELEMEN	T UNDER TEST: T-2 Antenna S	Subsystem	Serial Nº and/or versior	1:		
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
STEP		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS		
12.	Apply recommended rust preventive re-coating on Ferrous parts and clean the dust and excessive oil			ОК	ок			
13.	 Apply De-icing system and blister check procedure. <i>Notes:</i> Only one SSPA (T-2) and one TWTA Beam (T-1) can be turned ON when antenna Anti-Icing is enabled. Only one ECU can be in operation when Antenna Anti-Icing is enabled. 			ОК	ок			
	T-2 ACU Depl	oy, Stow and Jog						
1.	DEPLOY the ant that the antenna	tenna and verify there are no fa elevation angle is 10 degrees	ault messages present. Verify	ОК	ок			
2.	Activate STOW antenna STOW	Mode and check antenna stow command.	ving. And Check and record	Elevation Stow command -77	Command:			
3.	Check antenna i Check AZ STOV	s centred on AZ to 0 degree a V Centre switch operation.	nd fitting into the frame,	Check AZ centre Offset =0 Check Centre Switch	Offset=0.0 OK			
4.	Check antenna, If not, adjust the side of the eleva	eck antenna, slowing when antenna reaches 5-7cm to final stow position. not, adjust the Velocity switch, located under the cover at the inner left- le of the elevation axle shaft.			ок			
5.	Check Antenna	nna STOWED messages and actual STOW position		Elevation Stow actual value Stowed message	Actual Value: OK			
6.	DEPLOY the an Commands.	tenna again and check Manua	I ACU / Antenna JOG	ОК	ок			

			PROCEDURE / REPORT O	F TEST № 6.1		
TEST NAM and Antenn	ME: T-2 Antenna a Control System	ELEMENT	UNDER TEST: T-2 Antenna S	Subsystem	Serial Nº and/or versior	:
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS
7.	Check Manual AZ Hand Cranking			ОК	ОК	
8.	Check Manual EL Hand Cranking			ОК	ОК	
	T-2 ACU Emergency Stop Check					
1.	Verify the Emergency Stop on T-2 ACU stops antenna movement.			ОК	ОК	
2.	Verify ACU Eme	ergency Stop activation reports to	ASNMC	ОК	ОК	
3.	Verify resetting the ACU Emergency Stop restores antenna drive capability.			ОК	ОК	

			PROCEDURE / REPOR	T OF TEST № 6.1			
TEST NAME: T-2 Antenna and Antenna Control System		ELEMEN	ELEMENT UNDER TEST: T-2 Antenna Subsystem			Serial № and/or version:	
	-	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:	
STEP		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS	
	T-2 Antenna T	T-2 Antenna Travel Limits					
			Up Hardware Lim Up Software Lim Deploy 10	Limit 5 Limit 3 elocity EL(5-7 CM) Z -77(283)/0			

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	PROCEDURE / REPORT OF TEST № 6.1								
TEST NAM and Antenna	IE: T-2 Antenna a Control System	ELEMEN	T UNDER TEST: T-2 Antenna S	Subsystem	Serial Nº and/or version	:			
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS			
1.	Connect the PM	U Handheld Maintenance Unit	t to the T-2 PDU.	ОК	ОК				
2.	Manually move the antenna to be positioned over the Container centre line and record the azimuth and elevation angles.			ОК	AZ: EL:				
3	 Calculate the approximate setting for the azimuth CW and CCW Pre-Limits. They are set at the factory to be approximately ±150 degrees from the centre line setting. CW limit = Centre line azimuth +150 degrees. CCW limit = Centre line azimuth -150 degrees. 			ОК	CW Pre-Limit: CCW Pre-Limit:				
4.	Drive the antenr that there are no	na CW to a valid point, record to alarms present in the ACU or	the azimuth angle and verify ASNMC.	ОК	AZ Angle: OK				
5.	Drive the antenna in the CW direction. The ACU will alarm at the soft limit. Record the azimuth angle of the soft limit, verify the soft limit alarm is reported on the ACU and ASNMC.			ОК	Soft CW Limit: OK				
6.	Continue driving the antenna in the CW direction. The antenna will stop near the Az CW Pre-Limit, calculated in step 3. Record the azimuth angle at the CW Pre-Limit and verify the Pre-Limit is reported on the ACU and ASNMC.			ОК	CW Pre-Limit: OK				
7.	Drive the antenr that there are no	Drive the antenna CCW to a valid point, record the azimuth angle and verify that there are no alarms present in the ACU or ASNMC.		ОК	AZ Angle: OK				
8.	Drive the antenr Record the azim reported on the	Drive the antenna in the CCW direction. The ACU will alarm at the soft limit. Record the azimuth angle of the soft limit, verify the soft limit alarm is reported on the ACU and ASNMC.		ОК	Soft CCW Limit: OK				

			PROCEDURE / REPORT O	F TEST № 6.1		
TEST NAI and Antenn	ME: T-2 Antenna na Control System	ELEMEN	UNDER TEST: T-2 Antenna S	Subsystem	Serial Nº and/or version:	
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCI	E	EXPECTED RESULT	RESULT	REMARKS
 9. Continue driving the antenna in the CCW direction. The antenna will stop near the Az CCW Pre-Limit, calculated in step 3. Record the azimuth angle at the CCW Pre-Limit and verify the Pre-Limit is reported on the ACU and ASNMC. 			ОК	CCW Pre-Limit: OK		
10.	Drive the antenna in the CW direction back to the centre.			ОК	ок	
11.	Drive the antenna UP to a valid point, record the elevation angle and verify that there are no alarms present in the ACU or ASNMC.			ОК	EL Angle: OK	
12.	Drive the antenna in the UP direction. The ACU will alarm at the soft limit. Record the elevation angle of the soft limit, verify the soft limit alarm is reported on the ACU and ASNMC.			ОК	Soft UP Limit: OK	
13.	Continue driving the antenna in the UP direction. The antenna will stop near the UP Pre-Limit, set at approximately 88 degrees. Record the elevation angle at the UP Pre-Limit and verify the Pre-Limit is reported on the ACU and ASNMC.			ОК	UP Pre-Limit: OK	
14.	Drive the antenr angle and verify	a DOWN to a valid point off ce that there are no alarms prese	ntre, record the elevation nt in the ACU or ASNMC.	ОК	EL Angle: OK	
15.	Drive the antenna in the DOWN direction. The ACU will alarm at the soft limit. Record the elevation angle of the soft limit, verify the soft limit alarm is reported on the ACU and ASNMC.			ОК	Soft DN Limit: OK	
16.	Continue driving the antenna in the DOWN direction. The antenna will stop near DOWN Pre-Limit, set at approximately -2 degrees. Record the elevation angle at the DOWN Pre-Limit and verify the Pre-Limit is reported on the ACU and ASNMC.			ОК	DN Pre-Limit: OK	

			PROCEDURE / REPORT O	F TEST № 6.1		
TEST NAM and Antenn	ME: T-2 Antenna a Control System	ELEMEN	T UNDER TEST: T-2 Antenna S	Subsystem	Serial Nº and/or versior	::
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENC	E	EXPECTED RESULT	RESULT	REMARKS
	T-2 Antenna S	T-2 Antenna Safe-to-Transmit Limits				
1.	Point the antenna to clear sky and record the azimuth and elevation angles. This will be the antenna "set" position.			ОК	AZ: EL:	
2.	 <u>Set up Modem and Spectrum Analyzer:</u> Confirm all modems are OFF. At the L-Band Uplink Patch Panel, connect the output of EBEM #1 to T-2 antenna. Set EBEM #1 transmit to 1200 MHz CW at -20 dBm. Connect a Spectrum Analyzer on feed coupler DC1 directly or at the RF Monitor/Test Panel port 25 to view transmitted carrier at RF. 			ОК	ОК ОК ОК ОК	
3	Configure the T- "Combined Offlin	2 for normal operating conditioner mode and operating at 10 o	ons with the SSPAs in dB output back-off.	ОК	ок	
4.	At the T-2 ACU, set the safe-to-transmit angular limits to: • Azimuth CW: +5 degrees from antenna set position • Azimuth CCW: -5 degrees from antenna set position • Elevation Up: +5 degrees from antenna set position • Elevation Down: -5 degrees from antenna set position			ОК	ок	
5.	Drive the antenr the SSPAs are r	Drive the antenna in azimuth CW +3 degrees from the set position. Verify the SSPAs are not inhibited (mute).			ОК	
6.	Drive the antenr set position). Ve and the ACU inc	na in azimuth CW another +3 d rify the SSPAs are inhibited (R dicates alarms).	legrees (-6 degrees from the F mute On, no carrier at DC1	ОК	ок	

		-	PROCEDURE / REPORT O	F TEST № 6.1		
TEST NAM and Antenn	ME: T-2 Antenna a Control System	ELEMENT	UNDER TEST: T-2 Antenna S	Subsystem	Serial Nº and/or versior	1:
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCE	E	EXPECTED RESULT	RESULT	REMARKS
7.	Drive the azimuth CCW -6 degrees. Clear the ACU alarm and verify the SSPAs transmit.			ОК	ок	
8.	Drive the antenna in azimuth CCW -3 degrees. Verify the SSPAs are not inhibited.			ОК	ок	
9.	Drive the antenna in azimuth CCW another -3 degrees (-6 degrees from the antenna set position). Verify the SSPAs are inhibited (RF mute On, no carrier at DC1 and the ACU indicates alarms).			ОК	ок	
10.	Drive the azimuth CW +6 degrees. Clear the ACU alarm and verify the SSPAs transmit.			ОК	ок	
11.	Drive the antenna elevation up +3 degrees. Verify the SSPAs are not inhibited.			ОК	ок	
12.	Drive the antenr antenna set pos carrier at DC1 a	na elevation up another +3 degr ition). Verify the SSPAs are inh nd the ACU indicates alarms).	ees (+6 degrees from the ibited (RF mute On, no	ОК	ок	
13.	Drive the antenr verify the SSPA	na elevation down -6 degrees. C s transmit.	Clear the ACU alarm and	ОК	ок	
14.	Drive the antenr inhibited.	a elevation down -3 degrees. ∖	erify the SSPAs are not	ОК	ок	
15.	Drive the antenna elevation down another -3 degrees (-6 degrees from the antenna set position). Verify the SSPAs are inhibited (RF mute On, no carrier at DC1 and the ACU indicates alarms).			ОК	ок	
16.	Drive the antenna elevation up +6 degrees (back to the antenna set position). Clear the ACU alarm and verify the SSPAs transmit.			ОК	ок	

	PROCEDURE / REPORT OF TEST Nº 6.1								
TE and	E ST NAM d Antenna	IE: T-2 Antenna a Control System	ELEMEN	IT UNDER TEST: T-2 Antenn	a Subsystem	Serial № an	d/or version	:	
			TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE S	TART:	DATE END:	
	STEP		TEST SEQUENO) CE	EXPECTED RESUL	T RESI	RESULT		
	T-2 Satellite Acquisition								
	 Verify that all the required preconditions are met: GPS quality minimum of 8 Compass heading available Inclinometers feedback available (Tilt/Cross) Feedboom clamps released 				ок	0 0 0 0	< < < <		
	2. Check Satellite Preset list is configured for the 6 satellites as shown in the table below.			ОК	O	K			
Γ	Sate	ellite Name	Satellite Inclinatio	n Track mode	S/S Antenna pointed	Input signal level	Input signal Beacon		
	GO∖	/SAT	0	optrack	ок		Offset -4	5/low sig thr -80 3w:4Khz	
-	SKY	′ 5B	0	optrack	ок		Offset -4	5/low sig thr -80 3w:4Khz	
	SKY 5C		0	optrack	ок		Offset -4 /E	5/low sig thr -80 3w:4Khz	
	SKY 5D		0	optrack	ок		Offset -45/low sig /Bw:4Khz		
SCRALL1B		0	optrack	ок		Offset -4	5/low sig thr -80 3w:4Khz		
	SYR	ACUSE3A	0	optrack	ок		Offset -4	5/low sig thr -80 w:280Khz	

PROCEDURE / REPORT OF TEST Nº 6.1								
TEST NAM and Antenna	IE: T-2 Antenna a Control System	ELEMEN	T UNDER TEST: T-2 Antenna S	Subsystem	Serial № and/or version:			
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
STEP	P TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS			
3.	 <u>T-2 ACU Mark Angle</u> 1. Record the current stored compass mark angle, set by the owners of the terminal, at the home location of the terminal. 2. Remove Mark Angle by setting it to 0. 3. Calibrate compass. 			ОК	Home Location Mark Angle: deg.			
4.	 Calibrate compass. Acquire a Satellite Make sure TSGT is level. Configure ACU for a 10 degree box scan. Using GEO mode, attempt to acquire a known satellite using its pointing angle. Manually acquire the satellite if the auto-acquisition does not find it, then place the ACU in Optrack mode. Once in Optrack, wait 5 – 10 minutes for the antenna to peak on the satellite. Set Mark Angle for the offset and Save it. Stow Antenna and re-deploy, confirm azimuth reading is correct. Record the CSSC Mark Angle. 			ОК	CSSC Mark Angle: deg.			
5.	Choose another satellite from the Satellite Pre-Set list and confirm the satellite is acquired. Record in beacon signal input level in table above.			ОК	ок			

6.2 T-1 Antenna and Antenna Control System

			PROCEDURE / REPORT	OF TEST № 6.2			
TEST NA and Anten	ME: T-1 Antenna na Control System	ELEMENT UNDER TEST: T-1 Antenna Subsystem			Serial № and/or versior	Serial № and/or version:	
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:	
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS	
	T-1 Antenna M	aintenance					
1.	Check antenna m lubrication.	Check antenna motors/brakes and lubrication and perform cleaning and lubrication.			ок		
2.	Lubricate EL Drive Shaft and check motor operations for any abnormal noise.			ОК	ок		
3.	Lubricate AZ Drive Sector and check motor operations for any abnormal noise.			ОК	ок		
4.	Open, clean and	check AZ Brake and clutch syste	em functioning properly.	OK	ОК		
5.	Check antenna F	eed Membrane and Air leakage.		ОК	ОК		

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			PROCEDURE / REPORT C	F TEST № 6.2		
TEST NAME: T-1 Antenna and Antenna Control System		ELEMENT UNDER TEST: T-1 Antenna Subsystem		Subsystem	Serial № and/or version:	
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS
	T-1 ACU Deplo	y, Stow and Jog				
1.	Check PDU for la If not, then open F If necessary, rugg	Check PDU for label indicating that it has been ruggedized. If not, then open PDU to check. If necessary, ruggedize it then place label on PDU.			OK	
2.	Check that antenr	na drives in slow speed until the	velocity switch is released.	OK	ОК	
3.	Check that antenr	na stops for the stow bracket to b	be lowered.	ОК	ОК	

PROCEDURE / REPORT OF TEST Nº 6.2									
TEST NA and Antenr	TEST NAME: T-1 Antenna ELEMENT UNDER TEST: T-1 Antenna and Antenna Control System ELEMENT UNDER TEST: T-1 Antenna			Subsystem	Serial Nº and/or version	:			
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP	P TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS			
4.	DEPLOY the ante that the antenna	enna and verify there are no fa elevation angle is 22.5 degrees	ult messages present. Verify S.	ОК	ок				
5.	Engage "HANDLE LATCH" Check in the Limit Switch Logic Box that the HANDLE LATCH LED is OFF when switch actuated			ОК	ок ок				
6.	DEPLOY Antenna Wings Check in the 'Limit Switch Logic Box that the L WING DEPLOYED LED is OFF when switch actuated Check in the Limit Switch Logic Box that the R WING DEPLOYED LED is OFF when switch actuated			ОК	ок ок ок				
7.	Activate STOW M STOW command	lode and check antenna stowi	ng and record antenna	Elevation Stow command	Command:				
8.	Check antenna is centred on AZ properly to 0 degree and fitting into the frame, Check AZ STOW Centre switch operation. Check in the Limit Switch Logic Box that the AZ CENT LED is OFF when switch actuated			Check AZ centre Offset =0 Check Centre Switch	Offset= 0.0 OK				
9.	STOW Antenna Wings Check in the Limit Switch Logic Box that the L WING STOWED LED is OFF when switch actuated Check in the Limit Switch Logic Box that the R WING STOWED LED is OFF when switch actuated			ОК	ок				

			PROCEDURE / REPORT	DF TEST № 6.2		
TEST NA and Anten	ME: T-1 Antenna na Control System	ELEMENT	UNDER TEST: T-1 Antenna	Subsystem	Serial Nº and/or version	:
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS
10.	10.Check antenna Stow Velocity switch activates and stops Antenna Elevation Drive and unit creates STOWED message. Check in the Limit Switch Logic Box that the EL VELOCITY LED is OFF when switch actuated			Check Antenna stops when velocity switch is actuated	ок ок	
11.	Check Antenna STOWED messages and actual STOW position Check in the Limit Switch Logic Box that the STOWED LED is OFF when switch actuated			Elevation Stow actual value Stowed message	Actual Value: OK	
12.	Activate Emergen	Activate Emergency STOW mode with Wings open			ОК	
13.	DEPLOY the antenna again and check Manual ACU / Antenna JOG Commands.			ОК	ок	
14.	Release the Azimuth Brake and check Manual AZ Hand Cranking Check in the Limit Switch Logic Box that the AZ HANDCRANK LED is OFF when switch actuated Engage the Azimuth Brake			ОК	ок ок	
15.	Check Manual EL Hand Cranking Check in the Limit Switch Logic Box that the EL HANDCRANK LED is OFF when switch actuated			ОК	ок	
16.	Check Feed Assembly is in good condition.			ОК	ОК	
	T-1 ACU Emerg	gency Stop Checks				
1.	Verify the Emerge	ency Stop on T-1 ACU stops an	tenna movement.	ОК	ОК	
2.	Verify ACU Emerg	gency Stop activation reports to	ASNMC	OK	ОК	

PROCEDURE / REPORT OF TEST Nº 6.2										
TEST NA and Antenr	ME: T-1 Antenna na Control System	ELEMENT	ELEMENT UNDER TEST: T-1 Antenna Subsystem			1:				
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS				
3.	Verify resetting th	e ACU Emergency Stop restore	es antenna drive capability.	ОК	ОК					
4.	Verify the Emergency Stop on T-1 PDU stops antenna movement.			ОК	ОК					
5.	Verify PDU Emerg	gency Stop activation reports to	ASNMC	ОК	ОК					
6.	Verify resetting th	e ACU Emergency Stop restore	es antenna drive capability.	ОК	ОК					
	T-1 AC Safe-to-Rotate Checks									
1.	Verify the Safe-to	-Rotate activation at T-1 trailer	stops antenna movement.	ОК	ОК					
2.	Verify Safe-to-Rot	tate activation reports to ASNM	С	ОК	ОК					
3.	Verify resetting th	e Safe-to-Rotate restores anter	nna drive capability.	ОК	ок					

	PROCEDURE / REPORT OF TEST Nº 6.2									
TEST NAME: T-1 Antenna and Antenna Control System		ELEMENT UNDER TEST: T-1 Antenna Subsystem			Serial № and/or version:					
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
STEP	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS				
	T-1 Antenna Travel Limits									

PROCEDURE / REPORT OF TEST № 6.2										
TEST NAM and Antenna	IE: T-1 Antenna a Control System	ELEMENT	UNDER TEST: T-1 Antenna	Serial № and/or version	Serial № and/or version:					
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS				
This figure s	STEP TEST SEQUENCE This figure summarizes the azimuth and elevation angle settings for the T-1 antenna and ca Up Hardware Limit Up Hardware Limit Up Software Limit Deploy 22.5 E Up Hardware Limit Deploy 22.5 Up Hardware Limit Deploy 22.5				procedures in this section.					
1.	Connect the PMU	Handheld Maintenance Unit to	the T-1 PDU.		ОК					

	PROCEDURE / REPORT OF TEST Nº 6.2										
TEST NAI and Antenr	TEST NAME: T-1 Antenna ELEMENT UNDER TEST: T-1 Anten and Antenna Control System ELEMENT UNDER TEST: T-1 Anten		UNDER TEST: T-1 Antenna	Subsystem	Serial Nº and/or version	:					
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:					
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS					
2.	Manually move the antenna to be positioned over the Container centre line and record the azimuth and elevation angles.				AZ: EL:						
3	 Calculate the approximate setting for the azimuth CW and CCW Pre-Limits. They are set at the factory to be approximately ±65 degrees from the centre line setting. CW limit = Centre line azimuth +65 degrees. CCW limit = Centre line azimuth -65 degrees. 				CW Pre-Limit: CCW Pre-Limit:						
4.	Record the azimuth angle and verify that there are no alarms present in the ACU or ASNMC.				AZ Angle: OK						
5.	Drive the antenna Record the azimu reported on the A	in the CW direction. The ACU th angle of the soft limit, verify CU and ASNMC.	J will alarm at the soft limit. the soft limit alarm is		Soft CW Limit: OK						
6.	Continue driving the antenna in the CW direction. The antenna will stop near the Az CW Pre-Limit, calculated in step 3. Record the azimuth angle at the CW Pre-Limit and verify the Pre-Limit is reported on the ACU and ASNMC.				CW Pre-Limit: OK						
7.	Confirm at the Lin	nit Switch Logic Box that the A	Z CW LED is OFF.		ОК						
8.	Drive the antenna CCW to a valid point, record the azimuth angle and verify that there are no alarms present in the ACU or ASNMC and that the Limit Switch Logic Box that the AZ CW LED is ON.				AZ Angle: OK						
9.	Drive the antenna Record the azimu reported on the A	in the CCW direction. The AC the angle of the soft limit, verify CU and ASNMC.	CU will alarm at the soft limit. the soft limit alarm is		Soft CCW Limit:						

	PROCEDURE / REPORT OF TEST Nº 6.2									
TEST NA and Anten	ME: T-1 Antenna na Control System	ELEMENT	UNDER TEST: T-1 Antenna S	Subsystem	Serial Nº and/or version	:				
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS				
10.	 10. Continue driving the antenna in the CCW direction. The antenna will stop near the Az CCW Pre-Limit, calculated in step 3. Record the azimuth angle at the CCW Pre-Limit and verify the Pre-Limit is reported on the ACU and ASNMC. 			OK	CCW Pre-Limit: OK					
11.	Confirm at the Limit Switch Logic Box that the AZ CCW LED is OFF.			ОК	ок					
12.	Drive the antenna in the CW direction back to the centre and verify that there are no alarms present in the ACU or ASNMC and that the Limit Switch Logic Box AZ CCW LED is ON.			ОК	ок					
13.	Drive the antenna that there are no Switch Logic Box	UP to a valid point, record the alarms present in the ACU or A AZ CCW LED is ON.	elevation angle and verify SNMC and that the Limit	ОК	EL Angle: OK OK					
14.	Drive the antenna Record the elevat reported on the A	in the UP direction. The ACU ion angle of the soft limit, verify CU and ASNMC.	will alarm at the soft limit. the soft limit alarm is	ОК	Soft UP Limit: OK					
15.	Continue driving the antenna UP. The antenna will stop near the UP Pre- Limit, set at approximately 85 degrees. Record the elevation angle at the UP Pre-Limit and verify the Pre-Limit is reported on the ACU and ASNMC.			ОК	UP Pre-Limit: OK					
16.	Confirm at the Limit Switch Logic Box that the EL UP and EL UP-BACKUP LEDs are OFF.			ОК	ОК ОК					
17.	Drive the antenna DOWN to a valid point, record the elevation angle and verify that there are no alarms present in the ACU or ASNMC and that the Limit Switch Logic Box that the EL UP and EL UP-BACKUP LEDs are OFF.			OK	EL Angle: OK OK					

			PROCEDURE / REPORT C	F TEST № 6.2		
TEST NA and Anten	ME: T-1 Antenna na Control System	ELEMENT (JNDER TEST: T-1 Antenna	Subsystem	Serial Nº and/or version	:
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS
18.	Drive the antenna elevation angle of ACU and ASNMC	a DOWN. The ACU will alarm at the soft limit, verify the soft limit	the soft limit. Record the alarm is reported on the	ОК	Soft DN Limit: OK	
19.	Continue driving t Pre-Limit, set at a DOWN Pre-Limit ASNMC.	the antenna DOWN. The antenr approximately 0 degrees. Record and verify the Pre-Limit is report	a will stop near DOWN d the elevation angle at the ed on the ACU and	ОК	DN Pre-Limit: OK	
	T-1 Antenna Sa	afe-to-Transmit Limits				
1.	Point the antenna This will be the ar	to clear sky and record the azin htenna "set" position.	nuth and elevation angles.	ОК	AZ: EL:	
2.	Set up Modem and Spectrum Analyzer: 1. Confirm all modems are OFF. 2. At the L-Band Uplink Patch Panel, connect the output of EBEM #1 to T-1 antenna. 3. Set EBEM #1 transmit to 1200 MHz CW at -20 dBm. 4. Connect a Spectrum Analyzer on feed coupler DC1 directly or at the RF Monitor/Test Panel port 1 to view transmitted carrier at RF.			ОК	ок ок ок ок	
3	Configure the T-1 "Combined Offline	for normal operating conditions e" mode and operating at 10 dB	with the TWTAs in output back-off.	ОК		

PROCEDURE / REPORT OF TEST Nº 6.2									
TEST NAI and Antenr	ME: T-1 Antenna na Control System	ELEMENT	UNDER TEST: T-1 Antenna S	Subsystem	Serial Nº and/or version	::			
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS			
4.	 At the T-1 ACU, set the safe-to-transmit angular limits to: Azimuth CW: +5 degrees from antenna set position Azimuth CCW: -5 degrees from antenna set position Elevation Up: +5 degrees from antenna set position Elevation Down: -5 degrees from antenna set position 			ОК	ок				
5.	Drive the antenna TWTAs are not in	a in azimuth CW +3 degrees from hibited (mute).	m the set position. Verify the	ОК	ок				
6.	Drive the antenna in azimuth CW another +3 degrees (-6 degrees from the set position). Verify the TWTAs are inhibited (RF mute On, no carrier at DC1 and the ACU indicates alarms).			ОК	ок				
7.	Drive the azimuth TWTAs transmit.	CCW -6 degrees. Clear the AC	CU alarm and verify the	ОК	ок				
8.	Drive the antenna inhibited.	a in azimuth CCW -3 degrees. V	/erify the TWTAs are not	ОК	ок				
9.	Drive the antenna in azimuth CCW another -3 degrees (-6 degrees from the antenna set position). Verify the TWTAs are inhibited (RF mute On, no carrier at DC1 and the ACU indicates alarms).			ОК	ок				
10.	Drive the azimuth CW +6 degrees. Clear the ACU alarm and verify the TWTAs transmit.			ОК	ок				
11.	Drive the antenna elevation up +3 degrees. Verify the TWTAs are not inhibited.			ОК	ок				
12.	Drive the antenna antenna set positi carrier at DC1 and	elevation up another +3 degre ion). Verify the TWTAs are inhit d the ACU indicates alarms).	es (+6 degrees from the bited (RF mute On, no	ОК	ок				

			PROCEDURE / REPORT C	F TEST № 6.2		
TEST NA and Anten	ME: T-1 Antenna na Control System	ELEMENT UNDER TEST: T-1 Antenna Subsystem			Serial Nº and/or version	:
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS
13.	Drive the antenna verify the TWTAs	a elevation down -6 degrees. Clea transmit.	ar the ACU alarm and	ОК	ок	
14.	Drive the antenna elevation down -3 degrees. Verify the TWTAs are not inhibited.			ОК	ок	
15.	Drive the antenna elevation down another -3 degrees (-6 degrees from the antenna set position). Verify the TWTAs are inhibited (RF mute On, no carrier at DC1 and the ACU indicates alarms).			ОК	ок	
16.	Drive the antenna elevation up +6 degrees (back to the antenna set position). Clear the ACU alarm and verify the TWTAs transmit.			ОК	ок	
	T-1 Satellite Ac	cquisition				
1.	Verify that all the required preconditions are met: • GPS quality minimum of 8 • Compass heading available • Inclinometers feedback available (Tilt/Cross) • Feedboom clamps released			OK	ОК ОК ОК ОК	
2.	Check Satellite Pl table below.	reset list is configured for the 6 s	atellites as shown in the	ОК	ок	

				PROCEDURE / R	EPORT C	0F TEST № 6.2					
TEST N and Ante	AME: T-1 Antenna nna Control System		ELEMEN	IT UNDER TEST: T-1	Antenna	Subsystem		Serial Nº a	and/or version	:	
		TEST C	CONDUCTOR:	QA ENG:		CUSTO	OMER:	DATE	START:	DATE END:	
STEP	STEP TEST S		IEST SEQUENCE		EXPECTED RESULT		RESULT		REMARKS		
Sa	Satellite Name		Satellite Inclination	Track mode	S/S	Antenna pointed	Antenna Input signal level (Obse	Observations	
GC	OVSAT		0	optrack		ОК		Offset -45/low siç /Bw:4Kbz		5/low sig thr -80 w:4Khz	
SK	(Y 5B		0	optrack		ок			Offset -45 /B	Offset -45/low sig thr -80 /Bw:4Khz	
SK	SKY 5C		0	optrack		N/R		Offset -45/low si /Bw:4Kh		5/low sig thr -80 w:4Khz	
SK	(Y 5D		0	optrack	ок				Offset -45/low sig thr - /Bw:4Khz		
SC	RALL1B		0	optrack		N/R			Offset -45/low sig thr -80 /Bw:4Khz		
SY	RACUSE3A		0	optrack		N/R			Offset -45 /Bw	5/low sig thr -80 v:280Khz	
3.	3. T-1 ACU Mark Angle 1. Record the current stored compass mark angle, set by the owners of the terminal, at the home location of the terminal. 2. Remove Mark Angle by setting it to 0. 3. Calibrate compass.			с	К	Home Loc Angle:	ation Mark deg.				

	PROCEDURE / REPORT OF TEST Nº 6.2										
TEST NAM and Antenn	ME: T-1 Antenna na Control System	ELEMENT	UNDER TEST: T-1 Antenna S	Subsystem	Serial Nº and/or version	:					
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:					
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS					
4.	Acquire a Satellity 1. Make su 2. Configur 3. Using G pointing 4. Manually then play 5. Once in satellite. 6. Set Mark 7. Calibrate 8. Record t 9. Record t	e re Trailer is level. re ACU for a 10 degree box sca EO mode, attempt to acquire a angle. y acquire the satellite if the auto ce the ACU in Optrack mode. Optrack, wait 5 – 10 minutes fo k Angle for the offset and Save i e the compass and confirm azim the CSSC Mark Angle. the ACU beacon signal input lev	n. known satellite using its -acquisition does not find it, r the antenna to peak on the it. nuth reading is correct. vel in the table above.	ОК	CSSC Mark Angle:						
5.	Choose another s satellite is acquire	satellite from the Satellite Pre-Seed. Record in beacon signal inp	et list and confirm the but level in table above.	ОК	ок						
7 MEASUREMENTS AND CALIBRATIONS

7.1 **RF Monitor/Test Panel Calibrations**

			PROCEDURE / REPORT O	F TEST № 7.1		
TEST NAM Pane	E: RF Monitor/Test	ELEMEN	T UNDER TEST: RF Monitor/1	est Panel	Serial Nº and/or version	n:
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS
	T-2 Monitor Points					
1.	Record the coupling value at 8150 MHz for SSPA output coupler DC1 at T-2 Antenna.			ОК	dB	
2.	Measure the loss from cable #W325 at DC1 to T-2 HPA OUT port 25 of the RF Monitor/Test Panel.			ОК	dB	
3.	Calculate the tota	I loss (Coupling Value + Cable	OK	dB		
4.	Place a label on T indicating the tota	I-2 HPA OUT port 25 of the RF	Monitor/Test Panel	ОК	ОК	
5.	Record the coupli Antenna.	ing value at 7500 MHz for LNA	inject coupler DC3 at T-2	ОК	dB	
6.	Measure the loss of the RF Monitor	from cable #W327 at DC3 to T /Test Panel.	-2 LNA ON-LINE IN port 17	ОК	dB	
7	Calculate the tota	I loss (Coupling Value + Cable	Loss)	OK	dB	
8.	Place a label on T-2 LNA ON-LINE IN port 17 of the RF Monitor/Test Panel indicating the total calculated coupling and cable loss.		ОК	ОК		

			PROCEDURE / REPORT O	F TEST № 7.1		
TEST NAM Pane	E: RF Monitor/Test	ELEMEN	IT UNDER TEST: RF Monitor/7	Fest Panel	Serial Nº and/or version:	
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP	STEP TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS
	T-1 Monitor Points					
1.	Record the coupli Antenna.	Record the coupling value at 8150 MHz for TWTA output coupler DC1 at T-1 Antenna.			dB	
2.	Measure the loss from cable #W308 at DC1 to T-1 HPA OUT port 2 of the RF Monitor/Test Panel.			ОК	dB	
3.	Calculate the total loss (Coupling Value + Cable Loss)			ОК	dB	
4.	Place a label on T indicating the tota	I-1 HPA OUT port 2 of the RF	Monitor/Test Panel e loss.	ОК	ок	
5.	Record the coupli Antenna.	ing value at 7500 MHz for LNA	inject coupler DC3 at T-1	ОК	dB	
6.	Measure the loss of the RF Monitor	from cable #W309 at DC3 to T /Test Panel.	-1 LNA ON-LINE IN port 6	ОК	dB	
7	Calculate the tota	I loss (Coupling Value + Cable	Loss)	ОК	dB	
8.	Place a label on T-1 LNA ON-LINE IN port 6 of the RF Monitor/Test Panel indicating the total calculated coupling and cable loss.		ОК	ок		

7.2 TX RF Output Frequency Accuracy

			PROCEDURE / REPORT C	0F TEST № 7.2		
TEST NAI Freque	ME: Tx RF Output ency Accuracy	ELEMENT U	INDER TEST: Transmission	Subsystem	Serial Nº and/or version	n:
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS
1.	Shut down or plac	ce in Standby Mode (Mute) all SS	SPAs and TWTAs.	ОК	ОК	
2.	Verify the Signal Generator and the Frequency Counter are locked to the 10 MHz TFRS Distribution.			ОК	ок	
	Check Net Clock 10 MHz Power and Frequency					
1.	Connect Frequency Counter to the Net Clock (A), RF out BNC port, and measure the 10 MHz Output Frequency.			10.000.000Hz ±3 Hz	Hz	
3.	Connect Power M	Connect Power Meter or Spectrum Analyzer to the Spectracom Distribution Amplifier (A), RF out BNC port, and measure the 10 MHz Output Level.			dBm	
	Amplifier (A), RF				dBm	
4.	Connect Frequen measure the 10 M	cy Counter to the Net Cock (B), I /Hz Output Frequency.	RF out BNC port, and	10.000.000Hz ±3 Hz	Hz	
5.	Connect Power Meter or Spectrum Analyzer to the Net Clock (B), RF out BNC port, and measure the 10 MHz Output Level.			NET CLOCK 9383 +10dBm, ±1dBm NET CLOCK 9400 +13dBm, ±1dBm)	dBm dBm	

	PROCEDURE / REPORT OF TEST Nº 7.2									
TEST NAM Freque	ME: Tx RF Output ency Accuracy	ELEMENT	ELEMENT UNDER TEST: Transmission Subsystem			1:				
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
STEP	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS				
6.	Connect Power Meter or Spectrum Analyzer to the Spectracom Distribution Amplifier (B), RF out BNC port, and measure the 10 MHz Output Level.			NET CLOCK 9383 +0dBm, ±1dBm NET CLOCK 9400 +4dBm, ±1dBm)	dBm					
	T-1 BUC Output Frequency Accuracy									
1.	Switch T-1 BUC A	A Off-line.		ОК	ОК					
2.	Inject a -20 dBm, connects EBEM #	1200 MHz CW signal into Upli #1 to Combiner B.	nk Patch Panel where U-link	ок	ок					
3.	Connect the Freq RF Monitor/Test F	uency Counter to the T-1 BUC Panel.	OFF-LINE OUT port 5 of the	ОК	ок					
4.	Measure and reco	ord the T-1 BUC A output frequ	iency.	8.15*10 ⁹ ± 100 Hz	Hz					
5.	Remove the External Reference Input from T-1 BUC A. Measure the T-1 BUC A output frequency and adjust the BUC oscillator to achieve $8,150,000,000 \pm 100$ Hz. Record the frequency.		8.15*10 ⁹ ± 100 Hz	Hz						
6.	Reconnect the Ex	ternal Reference input to BUC	÷ A.	ОК	ОК					
7.	Switch T-1 BUC E frequency.	3 Off-line. Measure and record	the T-1 BUC B output	8.15*10 ⁹ ± 100 Hz	Hz					

			PROCEDURE / REPORT C	0F TEST № 7.2		
TEST NAM Freque	ME: Tx RF Output ency Accuracy	ELEMENT (ENT UNDER TEST: Transmission Subsystem		Serial Nº and/or versior	1:
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS
8.	 Remove the External Reference Input from T-1 BUC B. 8. Measure the T-1 BUC B output frequency and adjust the BUC oscillator to achieve 8,150,000,000 ± 100 Hz. Record the frequency. 			8.15*10 ⁹ ± 100 Hz	Hz	
9.	Reconnect the External Reference input to BUC B.			ОК	ОК	
	T-2 BUC Output Frequency Accuracy					
1.	Switch T-2 BUC A Off-line.			ОК	ОК	
2.	Inject a -20 dBm, connects EBEM #	1200 MHz CW signal into Uplink 1 to Combiner A.	Patch Panel where U-link	ОК	ОК	
3.	Connect the Freq the RF Monitor/Te	uency Counter to the T-2 BUC C est Panel.	OFF-LINE OUT port 23 of	ОК	ок	
4.	Measure and reco	ord the T-2 BUC A output freque	ncy.	8.15*10 ⁹ ± 100 Hz	Hz	
5.	Remove the Extern Measure the T-2 I achieve 8,150,000	rnal Reference Input from T-2 Bl BUC A output frequency and adj 0,000 ± 100 Hz. Record the freq	JC A. ust the BUC oscillator to uency.	8.15*10 ⁹ ± 100 Hz	Hz	
6.	Reconnect the Ex	ternal Reference input to BUC A	۸.	ОК	ОК	
7.	Switch T-2 BUC E frequency.	BUC B Off-line. Measure and record the T-2 BUC B output		8.15*10 ⁹ ± 100 Hz	Hz	
8.	Remove the Extern Measure the T-2 I achieve 8,150,000	rnal Reference Input from T-2 Bl BUC B output frequency and adj 0,000 ± 100 Hz. Record the freq	JC B. ust the BUC oscillator to uency.	8.15*10 ⁹ ± 100 Hz	Hz	

	PROCEDURE / REPORT OF TEST Nº 7.2								
TEST NAME: Tx RF Output ELEMENT UNDER TEST: Transmission		Subsystem	Serial Nº and/or version:						
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS			
9.	Reconnect the External Reference input to BUC B.			ОК	ОК				
10.	Remove the Signal Generator and Frequency Counter and restore the U- Link to the L-Band Uplink Patch Panel.			ОК	ОК				

7.3 RX L-Band Frequency Output Accuracy

	PROCEDURE / REPORT OF TEST № 7.3									
TEST NA Outpu	ME: Rx L-Band ut accuracy	ELEMEN	T UNDER TEST: Receive Su	ubsystem	Serial Nº and/or version:					
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
STEP	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS				
1.	Verify the Signal Generator and the Frequency Counter are locked to the 10 MHz TFRS Distribution.			ОК	ок					
	T-1 BDC Outpu	t Frequency Accuracy								
1.	Inject a -15 dBm, 7500 MHz CW signal to the T-1 BDC IN port 10 of the RF Monitor/Test Panel.			ОК	ок					
2.	Connect the Frequency Counter to Downlink Patch Panel where U-link connects EBEM #1 to Divider B.		ОК	ок						
3.	Switch BDC A on-	-line. Measure and record the T-	1 BDC A output frequency.	1200 MHz ± 100 Hz	Hz					

			PROCEDURE / REPORT C	9F TEST № 7.3		
TEST NA Outp	ME: Rx L-Band out accuracy	ELEMEN	T UNDER TEST: Receive S	ubsystem	Serial Nº and/or versior	1:
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS
4.	 Remove the External Reference Input from T-1 BDC A. Measure the T-1 BDC A output frequency and adjust the BDC oscillator to achieve 1,200,000,000 ± 100 Hz. Record the frequency. 			1200 MHz ± 100 Hz	Hz	
5.	Reconnect the External Reference input to BDC A.			ОК	ОК	
6.	Switch T-2 BDC B on-line. Measure and record the T-1 BDC B output frequency.			1200 MHz ± 100 Hz	Hz	
7.	 Remove the External Reference Input from T-1 BDC B. Measure the T-1 BDC B output frequency and adjust the BDC oscillator to achieve 1,200,000,000 ± 100 Hz. Record the frequency. 			1200 MHz ± 100 Hz	Hz	
8.	Reconnect the External Reference input to BDC B.			OK	ОК	
	T-2 BDC Outpu	It Frequency Accuracy				
1.	Inject a -15 dBm, Monitor/Test Pane	7500 MHz CW signal to the T-1 el.	BDC IN port 10 of the RF	ок	ок	
2.	Connect the Freq connects EBEM #	uency Counter to Downlink Patc #1 to Divider A.	ch Panel where U-link	ОК	ОК	
3.	Switch BDC A on	-line. Measure and record the T-	-1 BDC A output frequency.	1200 MHz ± 100 Hz	Hz	
4.	Remove the External Reference Input from T-1 BDC A. Measure the T-1 BDC A output frequency and adjust the BDC oscillator to achieve 1,200,000,000 ± 100 Hz. Record the frequency.		1200 MHz ± 100 Hz	Hz		
5.	Reconnect the Ex	ternal Reference input to BDC A	۹.	ОК	ОК	
6.	Switch T-2 BDC E frequency.	3 on-line. Measure and record th	ne T-1 BDC B output	1200 MHz ± 100 Hz	Hz	

	PROCEDURE / REPORT OF TEST № 7.3									
TEST NAME: Rx L-Band Output accuracy		ELEMEN	IT UNDER TEST: Receive S	ubsystem	Serial № and/or version:					
		TEST CONDUCTOR: QA ENG:		CUSTOMER:	DATE START:	DATE END:				
STEP	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS				
7.	Remove the External Reference Input from T-1 BDC B. Measure the T-1 BDC B output frequency and adjust the BDC oscillator to achieve $1,200,000,000 \pm 100$ Hz. Record the frequency.		1200 MHz ± 100 Hz	Hz						
8.	Reconnect the External Reference input to BDC B.		ОК	ОК						
9.	Remove the Signal Generator and Frequency Counter and restore the U- Link to the L-Band Uplink Patch Panel.			ОК	ОК					

7.4 TX Levels and Phase Alignment

7.4.1 <u>T-2 TX Levels and Phase Alignment</u>

The procedures in this section are summarized in the T-2 Transmit System figure below.



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		I	PROCEDURE / REPORT O	F TEST № 7.4.1		
TEST NAM	E: T-2 Tx Levels	ELEME	NT UNDER TEST: TX Subs	ystem	Serial Nº and/or versior	1:
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS
1.	Point Antenna to	cold sky.		ОК	ок	
2.	Set BUC A to 23.8 dB gain.1.Inject a 1200 MHz CW at -29.9 dB into BUC A RF In2.Adjust BUC A gain to -5.7 dBm at 8150 MHz RF Out			ОК	ок	
3.	Match BUC B to BUC A 1. Inject L-Band at J75 of Uplink L-Band Patch Panel (1200 MHz, -21 dBm). 2. Measure at RF Monitor/Test Panel Test Point 22 (T-2 On-line BUC Out). 3. Switch BUC B on-line. 4. Adjust BUC B gain to match level of BUC A at RF Monitor/Test Panel Test Point 22			ОК	ок	
4.	Set the T-2 Slope below:	e Equalizer to -0.6 dB and 19.0 dl	3 and confirm in the table	ОК	ок	
5.	Remove T-2 PIM	Shield.		OK	ОК	
6.	Inject -10 dBm, 1 1 for T-2 transmit	200 MHz at cable W212 (EBEM coperations.	1 Tx, J6) and patch EBEM	ОК	ок	
7.	Monitor input to SSPA A with a Spectrum Analyzer. Ensure that the cable loss is accounted for at 8150 MHz.			ОК	ок	
8.	Switch to BUC A.			OK	ОК	
9.	Adjust Slope Equ Record attenuato below.	alizer attenuator to achieve -19 c or setting in the SSPA and Slope	IBm at SSPA A input. Equalizer Settings table	ОК	ок	

	PROCEDURE / REPORT OF TEST Nº 7.4.1								
TEST NAMI and Phase A	E: T-2 Tx Levels	ELEM	IENT UNDER TES	T: TX Sub	system		Serial Nº a	nd/or version	1:
		TEST CONDUCTOR:	QA ENG: CUSTOMER:			DATE	START:	DATE END:	
STEP		TEST SEQUENCE	TEST SEQUENCE E			TED RESULT	RE	SULT	REMARKS
Note: This table will be filled in during the remainder of this procedure with SSPA and Slope Attenuator set					ettings.		_		
			2.4m Tx Leve	ls SSPA Ir	nput Settings	5			
	Step (BUC) Slope Setting Attenuat		or Setting	SSPA Input Le	vel				
		9 (BUC A)	-0.6		(dB)	19.0 dB	(Check)		
		11 (BUC B)	-0.6		(dB)	19.0 dB	(Check)		
2.4m Tx Levels SSPA Attenuator Linear Setting									
		Step (SSPA)	Slope Setting	Attenuat	ator Setting SSPA Attenuator				
		20 (SSPA A)	-0.6		(dB) (dB)				
		24 (SSPA B)	-0.6	(dB)		(dB)			
		32 (Combined SSPA)	-0.6		(dB)	51.3 dBm	(Check)		
10.	Switch to BUC B.					ОК	C	ОК	
11.	Adjust Slope equali Record attenuator s	zer attenuator to achieve -19 setting in the SSPA and Slop	dBm at SSPA A ir e Equalizer Setting	iput. s table.		ОК		Ж	
12.	Switch to BUC A.					ОК	C	Ж	
13.	Set Slope equalizer	r attenuator to figure recorde	d in step 9.			ОК	C	Ж	
14.	Remove the Spectr	rum Analyzer and normalise t	he input to SSPA A	۸.		ОК	C	ОК	
15.	Ensure the SSPAs	e the SSPAs are set to Combine Off-Line.				OK	0	ок	
16.	Monitor DC1 with a Power Meter. Ensure that the coupling factor is accounted for at 8150 MHz			i		ОК	C	ок	
17.	Apply power to both 10 dB.	n SSPAs and set both SSPA	A and B attenuator	rs to		ОК		ж	

	PROCEDURE / REPORT OF TEST Nº 7.4.1									
TEST NAM and Phase A	E: T-2 Tx Levels Alignment	ELEM	ENT UNDER TEST: TX Subs	system	Serial № and/or versior	1:				
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS				
18.	Set SSPA A to M	aintenance.		ОК	ОК					
19.	Command SSPA A to transmit and allow it to warm until the temperature settles out.			ОК	ок					
20	• Adjust SSPA A's attenuator to achieve 51.3 dBm at DC1 and record the attenuator setting in the SSPA and Slope Equalizer Settings table.			ОК	ок					
21.	Command SSPA A to Standby.			ОК	ОК					
22.	Set SSPA B to Maintenance.			ОК	ОК					
23.	Command SSPA B to transmit and allow it to warm until the temperature settles out.			ОК	ок					
24.	Adjust SSPA B's attenuator to achieve 51.3 dBm at DC1 and record the attenuator setting in the SSPA and Slope Equalizer Settings table.			ОК	ок					
25.	Command SSPA	B to Standby.		ОК	ОК					
26.	Set SSPAs to Co	mbine Off-Line.		ОК	ОК					
27.	Set the Slope equ step 9.	ualizer attenuator to 3 dB lower	that the figure recorded in	ОК	ок					
28.	Monitor DC 2 with accounted for at 8	n a Spectrum Analyzer. Ensure 8150 MHz.	that the cable loss is	ОК	ок					
29.	Command both S	SPAs to transmit.		ОК	ОК					
30.	While monitoring DC2 via the Spectrum Analyzer optimize the Phase Shifter for minimum reflected level at DC2.		ОК	ОК						
31.	Remove the Spec	ctrum Analyzer from DC2.		ОК	ОК					
32.	Using the Power achieve 51.3 dBn Slope Equalizer S	Meter at DC1 adjust the Slope I n at DC1 and record the attenua Settings table.	Equalizer attenuator to ator setting in the SSPA and	ОК	ок					

PROCEDURE / REPORT OF TEST Nº 7.4.1								
TEST NAME: T-2 Tx Levels and Phase Alignment ELEMENT UNDER TEST: TX Subs		system	Serial Nº and/or version:					
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
STEP	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS		
33.	Set Backup Slope	e Equalizer to -0.6 and 19.0 dB	3.	ОК	ОК			

7.4.2 <u>T-1 TX Levels and Phase Alignment</u>

The procedures in this section are summarized in the T-1 Transmit System figure below.



5. Adjust Slope Equalizer attenuator to achieve +45.0 dBm output at TWTA output for all TWTA/BUC combinations.

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PROCEDURE / REPORT OF TEST Nº 7.4.2									
TEST NAM and Phase A	I E: T-1 Tx Levels Alignment	ELE	MENT UNDER TEST: TX Subs	system Serial Nº and/or version:					
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP		TEST SEQUENCI		EXPECTED RESULT	RESULT	REMARKS			
1.	Point Antenna to	cold sky.		OK	ОК				
2.	 Set BUC A to 23.8 dB gain. 1. Inject a 1200 MHz CW at -29.9 dB into BUC A RF In 2. Adjust BUC A gain to -5.7 dBm at 8150 MHz RF Out. 			ОК	ок				
3.	Match BUC B to BUC A 1. Inject L-Band at J79 Uplink L-Band Patch Panel (1200 MHz, -21 dBm). 2. Measure at RF Monitor/Test Panel Test Point 4 (T-1 On-line BUC Out). 3. Switch BUC B on-line. 4. Adjust BUC B gain to match level of BUC A RF Monitor/Test Panel Test Point 4.			ОК	ок				
4.	Set the T-1 Slope	e Equalizer to -0.6 dB and 19.0) dB.	ОК	ОК				
5.	Remove T-1 wea	ther cover.		OK	ОК				
6.	Inject -10 dBm, 1 1 for T-1 transmit	200 MHz at cable W212 (EBE operations.	M 1 Tx, J6) and patch EBEM	ОК	ОК				
7.	Monitor input to TWTA A with a Spectrum Analyzer. Ensure that the cable loss is accounted for at 8150 MHz.			ОК	ОК				
8.	Switch to BUC A.			OK	ОК				
9.	Adjust Slope Equ Record attenuato below.	alizer attenuator to achieve -1 or setting in the TWTA and Slo	9 dBm at TWTA A input. pe Equalizer Settings table	ОК	ок				

			PROCEDURE / P	REPORT O	F TEST № 7	4.2			
TEST NAME and Phase A	E: T-1 Tx Levels lignment	ELEN	IENT UNDER TES	T: TX Sub	system		Serial Nº	and/or versio	n:
		TEST CONDUCTOR:	QA ENG: CUSTO			STOMER:	DATE	START:	DATE END:
STEP		TEST SEQUENCE			EXPEC	TED RESULT	RE	SULT	REMARKS
Note: This ta	able will be filled in dur	ring the remainder of this pro	cedure with TWTA	and Slope	Attenuator s	ettings.		_	
	4.6m Tx Levels TWTA					5			
		Step (BUC)	Slope Setting	Attenuat	or Setting	TWTA Input Le	vel		
		9 (BUC A)	-0.6		(dB)	19.0 dB	(Check)		
		11 (BUC B)	-0.6		(dB)	19.0 dB	(Check)		
4.6m Tx Levels TWTA Attenuator Linear Setting					Setting				
		Step (TWTA)	Slope Setting	Attenuator Setting TWTA		TWTA Attenuat	FWTA Attenuator		
		20 (TWTA A)	-0.6		(dB)	(dB)			
		24 (TWTA B)	-0.6	(dB)		(dB)			
		32 (Combined TWTA)	-0.6		(dB)	45.0 dBm	_ (Check)		
10.	Switch to BUC B.					ОК		ок	
11.	Adjust Slope equaliz Record attenuator s	zer attenuator to achieve -19 etting in the TWTA and Slop	dBm at TWTA A in e Equalizer Setting	nput. js table.		ОК		ок	
12.	Switch to BUC A.					ОК	(ОК	
13.	Set Slope equalizer	attenuator to figure recorded	d in step 9.			ОК		ок	
14.	Remove the Spectru	um Analyzer and normalise t	he input to TWTA	۹.		ОК	(ОК	
15.	Ensure the TWTAs	TWTAs are set to Combine Off-Line.				ОК		ок	
16.	Monitor DC1 with a accounted for at 815	Power Meter. Ensure that th 50 MHz	e coupling factor is			ОК		ок	
17.	Apply power to both 15 dB.	TWTAs and set both TWTA	A and B attenuato	ors to		ОК		ок	

PROCEDURE / REPORT OF TEST Nº 7.4.2								
TEST NAM and Phase A	E: T-1 Tx Levels Alignment	ELEN	IENT UNDER TEST: TX Subs	system	Serial Nº and/or versio	^{Iº} and/or version:		
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
18.	Set TWTA A to M	laintenance.		ОК	ОК			
19.	Command TWTA A to transmit and allow it to warm until the temperature settles out.			ОК	ок			
20	Adjust TWTA A's attenuator to achieve 45.0 dBm at DC1 and record the attenuator setting in the TWTA and Slope Equalizer Settings table.			ОК	ок			
21.	Command TWTA	A to Standby.		ОК	ОК			
22.	Set TWTA B to Maintenance.			ОК	ОК			
23.	Command TWTA B to transmit and allow it to warm until the temperature settles out.			ОК	ОК			
24.	Adjust TWTA B's attenuator to achieve 45.0 dBm at DC1 and record the attenuator setting in the TWTA and Slope Equalizer Settings table.			ОК	ок			
25.	Command TWTA	B to Standby.		ОК	ОК			
26.	Set TWTAs to Co	mbine Off-Line.		ОК	ОК			
27.	Set the Slope equ step 9.	ualizer attenuator to 3 dB lower	that the figure recorded in	ОК	ок			
28.	Monitor DC 2 with accounted for at 8	n a Spectrum Analyzer. Ensure 3150 MHz.	that the cable loss is	ОК	ок			
29.	Command both T	WTAs to transmit.		ОК	ОК			
30.	While monitoring DC2 via the Spectrum Analyzer optimize the Phase Shifter for minimum reflected level at DC2.			ОК	ок			
31.	Remove the Spec	ctrum Analyzer from DC2.		ОК	ОК			
32.	Using the Power achieve 45.0 dBn Slope Equalizer S	Meter at DC1 adjust the Slope n at DC1 and record the attenue Settings table.	Equalizer attenuator to ator setting in the TWTA and	ОК	ок			

7.4.3 <u>T-2 Amplitude Response and Slope Equalizer Adjustment</u>

			PROCEDURE / REPORT OF	TEST № 7.4.3		
TEST NAN Response Equalizer A	TEST NAME: T-2 Amplitude Response and Slope Equalizer AlignmentELEMENT UNDER TEST: TX Subsy			ystem Serial Nº and/or version:		:
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS
 Configure and calibrate Network Analyzer for -10 dBm input of a swept 1200 MHz ± 250 MHz, measuring an upconverted frequency of 8150 MHz ± 250 MHz and measurements of 502 points, 0.996 MHz. 			ОК	ок		
2.	 Adjust Network Analyzer settings to: 1. Averaging = 10 2. Smoothing = 2 3. IF BW = 30K 4. Scale Per Div = 1 5. Coupler Factor Offset 			ОК	ок	
3.	Ensure the SSPA	As are set to Combine Off-Line.		ОК	ОК	
4.	Apply power to b	oth SSPAs and ensure both are	commanded to Standby.	OK	ОК	
5.	Set the Slope Eq values in the tabl	ualizer slope and attenuator to t e on page 55.	he "Combined SSPA"	ОК	ок	
6.	Confirm that the	SSPA attenuators are set as pe	r table on page 55.	ОК	ОК	
7.	Connect the Net Panel and patch	work Analyzer port 1 inject J47 c EBEM 1 for T-2 transmit operat	of the Uplink L-Band Patch ions.	ОК	ок	
8.	Connect the Net	work Analyzer port 2 receive cat	ble to T-2 DC1.	OK	ОК	
9.	Switch to BUC A			OK	ОК	
10.	Command the SSPAs to transmit and allow them to warm until the temperature settles out.			ОК	ок	
11.	On the Network A and 8400 MHz).	Analyzer, activate markers, low-	mid-high band. (7900, 8150	OK	ок	

	PROCEDURE / REPORT OF TEST № 7.4.3									
TEST NAM Response Equalizer Al	IE: T-2 Amplitude and Slope lignment	El		R TEST: TX S	Subsystem Serial Nº and/or version:			::		
		TEST CONDUCTOR:	QA	ENG:		CUSTOMER:	DATE	E START:	DATE END:	
STEP		TEST SEQUE	NCE		EX	PECTED RESULT	r Ri	ESULT	REMARKS	
12.	Record the meas	ured level for the mid-band	l marker.			dBm				
13.	Record the initial measured at 7900 SSPAs.	slope (dB p-p) as determin 0 MHz and 8400 MHz in ta	ed by the differe ble below for BU	nce in level C A / Comb.		ОК		ок		
	T-2 Amplitude Response and Slope Equalizer Alignment									
		Slope Equalizer	Initial Slope (dB)	On-Line BUC	On-Line SSPA	Slope Preset (dB)	Attenuation (dB)			
		2.4m		А	A+B					
		2.4m		В	A+B					
		2.4m		A	А					
		2.4m		В	В					
		2.4m		А	В					
		2.4m		В	А					
		Back Up		A	A+B	-0.6	19.0			
		Back Up		В	A+B	-0.6	19.0	_		
		Back Up		A	A	-0.6	19.0	_		
		Back Up		В	В	-0.6	19.0	_		
		Back Up		A	В	-0.6	19.0			

PROCEDURE / REPORT OF TEST Nº 7.4.3									
TEST NAM Response Equalizer Ali	E: T-2 Amplitude and Slope ignment	ELEM	MENT UNDER TEST: TX Subs	system	Serial № and/or version:				
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP		TEST SEQUENCE	Ē	EXPECTED RESULT	RESULT	REMARKS			
14.	 <u>Slope Equalizer Setting</u> Determine the optimum slope equalization to compensate for the slope. Adjust the slope value for optimum path slope compensation. Adjust the Slope Equalizer attenuator setting to achieve the recorded mid-band level in step 12. Record the final BUC A / Comb. SSPAs Slope Equalizer settings in table above. Caution: The slope and gain settings of the equalizer are interactive. Changing slope compensation will change gain. The output level of the SSPA must be carefully monitored while adjusting the slope equalizer. 			Max P-P variation is 2 dB (+/- 1 dB).	ок				
15.	Capture the Netw	vork Analyzer Trace and paste	it below.	ОК	ОК				
		Paste	BUC A / COMB SSPA Amplitu	ude Response JPG here.					
16.	Switch to BUC B.			ОК	ОК				
17.	Set the Slope Equalizer slope and attenuator to the "Combined SSPA" values in the table on page 55.			ОК	ОК				
18.	Record the meas	Record the measured level for the mid-band marker.							
19.	Record the initial measured at 7900 SSPAs.	slope (dB p-p) as determined 0 MHz and 8400 MHz in the ta	by the difference in level above for BUC B / Comb.	ОК	ок				

			PROCEDURE / REPORT O	F TEST № 7.4.3		
TEST NAM Response Equalizer Ali	E: T-2 Amplitude and Slope ignment	ELEM	MENT UNDER TEST: TX Subs	system Serial Nº and/or version:		:
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCE	Ē	EXPECTED RESULT	RESULT	REMARKS
20.	Slope Equalizer Setting 1. Determine the optimum slope equalization to compensate for the slope. 2. Adjust the slope value for optimum path slope compensation. 3. Adjust the Slope Equalizer attenuator setting to achieve the recorded mid-band level in step 18. 4. Record the final BUC B / Comb. SSPAs Slope Equalizer settings in table above.			Max P-P variation is 2 dB (+/- 1 dB).	ок	
21.	Capture the Netw	vork Analyzer Trace and paste	it below.	ОК	ОК	
		Paste	BUC B / COMB SSPA Amplitu	ude Response JPG here.		
22.	Switch to SSPAs	to SSPA A Maintenance mod	le.	ОК	ОК	
23.	Set the Slope Equalizer slope and attenuator to the "SSPA A" values in the table on page 55.			ОК	ок	
24.	Record the measured level for the mid-band marker.			dBm		
25.	Record the initial measured at 790 A.	slope (dB p-p) as determined 0 MHz and 8400 MHz in the ta	by the difference in level able above for BUC B / SSPA	ОК	ок	

			PROCEDURE / REPORT O	F TEST № 7.4.3		
TEST NAM Response Equalizer Ali	TEST NAME: T-2 Amplitude Response and Slope Equalizer Alignment			system Serial Nº and/or version:		:
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS
26.	Slope Equalizer S 1. Determin slope. 2. Adjust th 3. Adjust th recorder 4. Record to above.	 <u>Slope Equalizer Setting</u> Determine the optimum slope equalization to compensate for the slope. Adjust the slope value for optimum path slope compensation. Adjust the Slope Equalizer attenuator setting to achieve the recorded mid-band level in step 24. Record the final BUC B / SSPA A Slope Equalizer settings in table above. 			ок	
27.	Capture the Netw	vork Analyzer Trace and paste	it below.	ОК	ОК	
		Pas	ste BUC B / SSPA A Amplitude	e Response JPG here.		
28.	Switch to BUC A.			ОК	ок	
29.	Set the Slope Equalizer slope and attenuator to the "SSPA A" values in the table on page 55.			ОК	ок	
30.	Record the measured level for the mid-band marker.			dBm		
31.	Record the initial measured at 790	slope (dB p-p) as determined 0 MHz and 8400 MHz in the ta	by the difference in level able above for BUC A / SSPA	ОК	ок	

			PROCEDURE / REPORT O	F TEST № 7.4.3		
TEST NAM Response Equalizer Ali	TEST NAME: T-2 Amplitude Response and Slope Equalizer Alignment ELEMENT UNDER TEST: TX Sull			system Serial № and/or version:		:
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCE	Ē	EXPECTED RESULT	RESULT	REMARKS
32.	 <u>Slope Equalizer Setting</u> Determine the optimum slope equalization to compensate for the slope. Adjust the slope value for optimum path slope compensation. Adjust the Slope Equalizer attenuator setting to achieve the recorded mid-band level in step 30. Record the final BUC A / SSPA A Slope Equalizer settings in table above. 			Max P-P variation is 2 dB (+/- 1 dB).		
33.	Capture the Netw	ork Analyzer Trace and paste	it below.			
		Pa	ste BUC A / SSPA A Amplitude	e Response JPG here.		
34.	Switch to SSPAs	to SSPA B Maintenance mod	le.	ОК	ок	
35.	Set the Slope Equation table on page 55.	ualizer slope and attenuator to	the "SSPA B" values in the	ОК	ок	
36.	Record the measured level for the mid-band marker.			dBm		
37.	Record the initial measured at 7900 B.	slope (dB p-p) as determined 0 MHz and 8400 MHz in the ta	by the difference in level able above for BUC A / SSPA	ОК	ок	

PROCEDURE / REPORT OF TEST Nº 7.4.3									
TEST NAM Response Equalizer Ali	E: T-2 Amplitude and Slope ignment	ELEM	IENT UNDER TEST: TX Subs	system Serial Nº and/or version:		:			
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS			
38.	 <u>Slope Equalizer Setting</u> Determine the optimum slope equalization to compensate for the slope. Adjust the slope value for optimum path slope compensation. Adjust the Slope Equalizer attenuator setting to achieve the recorded mid-band level in step 36. Record the final BUC A / SSPA B Slope Equalizer settings in table above. 			Max P-P variation is 2 dB (+/- 1 dB).	ок				
39.	Capture the Netw	vork Analyzer Trace and paste	it below.	ОК	ОК				
		Pas	ste BUC A / SSPA B Amplitude	Response JPG here.					
40.	Switch BUC B.			ОК	ОК				
41.	Set the Slope Equalizer slope and attenuator to the "SSPA B" values in the table on page 55.			ОК	ок				
42.	Record the measured level for the mid-band marker.			dBm					
43.	Record the initial measured at 790 B.	slope (dB p-p) as determined 0 MHz and 8400 MHz in the ta	by the difference in level ble above for BUC B / SSPA	ОК	ок				

	PROCEDURE / REPORT OF TEST Nº 7.4.3										
TEST NAM Response Equalizer Ali	E: T-2 Amplitude and Slope ignment	ELEMENT UNDER TEST: TX Subsystem			Serial № and/or version:						
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:					
STEP		TEST SEQUENCE	E	EXPECTED RESULT	RESULT	REMARKS					
44.	 <u>Slope Equalizer Setting</u> Determine the optimum slope equalization to compensate for the slope. Adjust the slope value for optimum path slope compensation. Adjust the Slope Equalizer attenuator setting to achieve the recorded mid-band level in step 42. Record the final BUC B / SSPA B Slope Equalizer settings in table above. 			Max P-P variation is 2 dB (+/- 1 dB).	ок						
45.	Capture the Netw	ork Analyzer Trace and paste	it below.	ОК	ОК						
	Paste BUC B / SSPA B Amplitude Response JPG here.										
46	Set both SSPAs t mode.	o Standby and switch the SSF	PAs to Combined Off-line	ОК	ОК						

7.4.4 <u>T-1 Amplitude Response and Slope Equalizer Adjustment</u>

			PROCEDURE / REPORT OF	TEST № 7.4.4		
TEST NAME: T-1 Amplitude Response and Slope ELEMENT UNDER TEST: TX Subsystem Equalizer Alignment Element Element Element Element		vstem Serial № and/or version:		:		
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS
1.	 Configure and calibrate Network Analyzer for -10 dBm input of a swept 1200 MHz ± 250 MHz, measuring an upconverted frequency of 8150 MHz ± 250 MHz and measurements of 502 points, 0.996 MHz. 			ОК	ок	
2.	Adjust Network Analyzer settings to: 1. Averaging = 10 2. Smoothing = 2 3. IF BW = 30K 4. Scale Per Div = 1 5. Coupler Factor Offset			ОК	ок	
3.	Ensure the TWT	As are set to Combine Off-Line.		ОК	ОК	
4.	Apply power to b	oth TWTAs and ensure both are	commanded to Standby.	ОК	ОК	
5.	Set the Slope Eq values in the tabl	ualizer slope and attenuator to tl e on page 60.	ne "Combined TWTA"	ОК	ок	
6.	Confirm that the	TWTA attenuators are set as pe	r table on page 60.	OK	ОК	
7.	Connect the Netw Patch Panel and	vork Analyzer port 1 inject at J6 ² patch EBEM 1 for T-1 transmit c	l of the Uplink L-Band operations.	ОК	ок	
8.	Connect the Netw	Connect the Network Analyzer port 2 receive cable to T-1 DC1.			ОК	
9.	Switch to BUC A.			ОК	ОК	
10.	Command the TV temperature settl	Command the TWTAs to transmit and allow them to warm until the temperature settles out.			ок	
11.	On the Network A and 8400 MHz).	Analyzer, activate markers, low-r	nid-high band. (7900, 8150	ОК	ок	

PROCEDURE / REPORT OF TEST Nº 7.4.4										
TEST NAM Response Equalizer Al	IE: T-1 Amplitude and Slope lignment	EL	EMENT UNDEF	R TEST: TX :	Subsystem		Serial №	and/or versior	n:	
		TEST CONDUCTOR:	Q/	A ENG:		CUSTOMER:	DATI	E START:	DATE END:	
STEP		TEST SEQUEN	ICE		EX	PECTED RESULT	· RI	ESULT	REMARKS	
12.	Record the meas	ured level for the mid-band	marker.			dBm				
13.	Record the initial measured at 7900 TWTAs.	Record the initial slope (dB p-p) as determined by the difference in level measured at 7900 MHz and 8400 MHz in table below for BUC A / Comb. TWTAs.				OK		ок		
		T-	1 Amplitude Re	sponse and	Slope Equa	lizer Alignment				
		Slope Equalizer	Initial Slope (dB)	On-Line BUC	On-Line TWTA	Slope Preset (dB)	Attenuation (dB)			
		4.6m		A	A+B					
		4.6m		В	A+B					
		4.6m		A	A					
		4.6m		В	В					
		4.6m		A	В					
		4.6m		В	A					

PROCEDURE / REPORT OF TEST Nº 7.4.4								
TEST NAME: T-1 Amplitude Response and Slope Equalizer AlignmentELEMENT UNDER TEST: TX Subs		system	Serial № and/or version	:				
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
14.	 <u>Slope Equalizer Setting</u> Determine the optimum slope equalization to compensate for the slope. Adjust the slope value for optimum path slope compensation. Adjust the Slope Equalizer attenuator setting to achieve the recorded mid-band level in step 12. Record the final BUC A / Comb. TWTAs Slope Equalizer settings in table above. Caution: The slope and gain settings of the equalizer are interactive. Changing slope compensation will change gain. The output level of the TWTA must be carefully monitored while adjusting the slope equalizer. Overdrive of the TWTAs can result in an TWTA failure. 		Max P-P variation is 2 dB (+/- 1 dB).	ок				
15.	Capture the Netw	ork Analyzer Trace and paste	it below.	ОК	ОК			
		Paste	BUC A / COMB TWTA Amplitu	ude Response JPG here.				
16.	Switch to BUC B.			ОК	ОК			
17.	Set the Slope Equalizer slope and attenuator to the "Combined TWTA" values in the table on page 60.		ОК	ОК				
18.	Record the meas	ured level for the mid-band ma	arker.	dBm				
19.	Record the initial measured at 7900 TWTAs.	slope (dB p-p) as determined 0 MHz and 8400 MHz in the ta	by the difference in level ble above for BUC B / Comb.	ОК	ок			

	PROCEDURE / REPORT OF TEST Nº 7.4.4							
TEST NAME: T-1 Amplitude Element UNDER TEST: TX Subsystem Response and Slope Equalizer Alignment Element UNDER TEST: TX Subsystem		ystem	Serial № and/or version	:				
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
STEP		TEST SEQUENCE	-	EXPECTED RESULT	RESULT	REMARKS		
20.	 <u>Slope Equalizer Setting</u> Determine the optimum slope equalization to compensate for the slope. Adjust the slope value for optimum path slope compensation. Adjust the Slope Equalizer attenuator setting to achieve the recorded mid-band level in step 18. Record the final BUC B / Comb. TWTAs Slope Equalizer settings in table above. 		Max P-P variation is 2 dB (+/- 1 dB).	ок				
21.	Capture the Netw	ork Analyzer Trace and paste	it below.	ОК	ОК			
		Paste	BUC B / COMB TWTA Amplitu	ude Response JPG here.				
22.	Switch to TWTAs	to TWTA A Maintenance mo	de.	ОК	ОК			
23.	Set the Slope Equalizer slope and attenuator to the "TWTA A" values in the table on page 60.		ОК	ок				
24.	Record the meas	Record the measured level for the mid-band marker.		dBm				
25.	Record the initial slope (dB p-p) as determined by the difference in level measured at 7900 MHz and 8400 MHz in the table above for BUC B / TWTA A.		ОК	ок				

	PROCEDURE / REPORT OF TEST Nº 7.4.4								
TEST NAME: T-1 Amplitude Response and Slope Equalizer Alignment ELEMENT UNDER TEST: TX Subsystem		system	Serial Nº and/or version	:					
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS			
26.	Slope Equalizer S 1. Determin slope. 2. Adjust th 3. Adjust th recorder 4. Record to above.	Setting ne the optimum slope equaliza ne slope value for optimum pa ne Slope Equalizer attenuator d mid-band level in step 24. the final BUC B / TWTA A Slo	ation to compensate for the th slope compensation. setting to achieve the pe Equalizer settings in table	Max P-P variation is 2 dB (+/- 1 dB).	ок				
27.	Capture the Netw	ork Analyzer Trace and paste	it below.	ОК	ОК				
		Pas	ste BUC B / TWTA A Amplitude	e Response JPG here.					
28.	Switch to BUC A.			ОК	ок				
29.	Set the Slope Equalizer slope and attenuator to the "TWTA A" values in the table on page 60.		ОК	ок					
30.	Record the measured level for the mid-band marker.		dBm						
31.	Record the initial measured at 790	slope (dB p-p) as determined 0 MHz and 8400 MHz in the ta	by the difference in level able above for BUC A / TWTA	ОК	ок				

	PROCEDURE / REPORT OF TEST Nº 7.4.4								
TEST NAME: T-1 Amplitude Response and Slope Equalizer Alignment ELEMENT UNDER TEST: TX Subsy		system	Serial № and/or version	:					
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP		TEST SEQUENCI	Ē	EXPECTED RESULT	RESULT	REMARKS			
32.	Slope Equalizer S 1. Determin slope. 2. Adjust th 3. Adjust th recorder 4. Record to above.	Setting ne the optimum slope equaliza ne slope value for optimum pa ne Slope Equalizer attenuator d mid-band level in step 30. the final BUC A / TWTA A Slo	Max P-P variation is 2 dB (+/- 1 dB).						
33.	Capture the Netw	ork Analyzer Trace and paste	it below.						
		Pas	ste BUC A / TWTA A Amplitude	e Response JPG here.					
34.	Switch to TWTAs	to TWTA B Maintenance mo	de.	ОК	ок				
35.	Set the Slope Equalizer slope and attenuator to the "TWTA B" values in the table on page 60.			ОК	ок				
36.	Record the measured level for the mid-band marker.			dBm					
37.	Record the initial measured at 790 B.	slope (dB p-p) as determined 0 MHz and 8400 MHz in the ta	by the difference in level able above for BUC A / TWTA	ОК	ок				

PROCEDURE / REPORT OF TEST Nº 7.4.4							
TEST NAME: T-1 Amplitude Element UNDER TEST: TX Subsystem Response and Slope Equalizer Alignment Element UNDER TEST: TX Subsystem		system	Serial Nº and/or version	:			
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:	
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS	
38.	Slope Equalizer S 1. Determin slope. 2. Adjust th 3. Adjust th recorded 4. Record to above.	 <u>Slope Equalizer Setting</u> Determine the optimum slope equalization to compensate for the slope. Adjust the slope value for optimum path slope compensation. Adjust the Slope Equalizer attenuator setting to achieve the recorded mid-band level in step 36. Record the final BUC A / TWTA B Slope Equalizer settings in table above. 			ок		
39.	Capture the Netw	ork Analyzer Trace and paste	it below.	ОК	ОК		
		Pas	ste BUC A / TWTA B Amplitude	e Response JPG here.			
40.	Switch BUC B.			ОК	ОК		
41.	Set the Slope Equalizer slope and attenuator to the "TWTA B" values in the table on page 60.			ОК	ок		
42.	Record the measured level for the mid-band marker.		dBm				
43.	Record the initial measured at 7900 B.	slope (dB p-p) as determined 0 MHz and 8400 MHz in the ta	by the difference in level ble above for BUC B / TWTA	ОК	ок		

	PROCEDURE / REPORT OF TEST Nº 7.4.4									
TEST NAME: T-1 AmplitudeResponseandSlopeEqualizer Alignment		ELEMENT UNDER TEST: TX Subsystem			Serial № and/or version:					
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
STEP		TEST SEQUENCE	E	EXPECTED RESULT	RESULT	REMARKS				
44.	 <u>Slope Equalizer Setting</u> Determine the optimum slope equalization to compensate for the slope. Adjust the slope value for optimum path slope compensation. Adjust the Slope Equalizer attenuator setting to achieve the recorded mid-band level in step 42. Record the final BUC B / TWTA B Slope Equalizer settings in table above 		Max P-P variation is 2 dB (+/- 1 dB).	ок						
45.	Capture the Netw	ork Analyzer Trace and paste	it below.	ОК	ОК					
	Paste BUC B / TWTA B Amplitude Response JPG here.									
46	Set both TWTAs mode.	to Standby and switch the TW	TAs to Combined Off-line	ОК	ОК					

7.5 RX Receive Chain Level Alignment

7.5.1 <u>T-2 LNA Gain and Receive Chain Level Alignment</u>

The procedures in this section are summarized in the T-2 Receive System figure below.



Set T-2 RECEIVE GAIN to 105 dB

- 1a. If at least 1 LNA is found to be in specification during testing, inject 7500 MHz CW at a level of -62 dBm into LNA input.
- 1b. If both LNAs are found to be in specification during testing, inject 7500 MHz CW at a level of -11 dBm into J1 of LNA Bulkhead Assembly.
- 2. Adjust the gain of each BDC to achieve a level of -10 dBm at J72 of Downlink L-Band Patch Panel.
- 3. Adjust the gain of the L-Band Amplifier in the Downlink L-Band Patch Panel to achieve a level of 0 dBm at the input to EBEM Modem #1.

			PROCEDURE / REPORT O	F TEST № 7.5.1		
TEST NAME: T-2 LNA Gain and Receive ELEMENT UNDER TEST: RX Subsyst Chain Level Alignment ELEMENT UNDER TEST: RX Subsyst			stem	Serial № and/or version	:	
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUEN	CE	EXPECTED RESULT	RESULT	REMARKS
1.	Point the T-2	antenna to cold sky.		ОК	ОК	
2.	Command LN	IA A on-line		ОК	ОК	
3.	Configure and calibrate Network Analyzer to inject a swept 7500 MHz ± 250 MHz at -62 dBm with measurements of 502 points, 0.996 MHz at DC3. (Set input level to account for DC3 Coupling Factor)			ОК	ок	
4.	Adjust Network Analyzer settings to: 1. Averaging = 10 2. Smoothing = 2 3. IF BW = 30K 4. Scale Per Div = 1 5. Coupler Factor Offset			ОК	ок	
5.	Connect the N	Network Analyzer port 1 inject ca	able to DC3.	ОК	ОК	
6.	Connect the N	Network Analyzer port 2 receive	cable to J1 at the LNA Plate.	ОК	ОК	
7.	On the Netwo and 7750 MH	rk Analyzer, activate markers, l z)	ow-mid-high band. (7250, 7500	ОК	ок	
8.	Record LNA A	A gain at 7500 MHz.		>50 dB	dB	
9.	Capture Netw	ork Analyzer Trace for the LNA	A and paste it below.	ОК	ОК	
	Paste LNA-A > Amplitude Re					
10.	Command LNA B on-line			ОК	ОК	
11.	Record LNA B gain at 7500 MHz.			>50 dB	dB	
12.	Capture Netw	ork Analyzer Trace for the LNA	B and paste it below.	OK	ОК	
			Paste LNA-B > Amplitude Re	sponse JPG here.		

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PROCEDURE / REPORT OF TEST № 7.5.1										
TEST NAME: T-2 LNA Gain and Receive ELEMENT UNDER TEST: RX Subsyst Chain Level Alignment ELEMENT UNDER TEST: RX Subsyst		stem	Serial № and/or version	:						
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
STEP		TEST SEQUEN	CE	EXPECTED RESULT	RESULT	REMARKS				
	Note : If practi LNAs, conside continuing wit	ical, as the test setup is still con er sweeping the T-1 LNAs now th the full Rx-chain calibration o	figured for sweeping single (in Section 7.5.2), and then f the T-2.							
13.	Inject a CW of 7500 MHz ± 250 MHz at -62 dBm (Set input level to account for DC3 Coupling Factor). Note : If both LNAs are below specification and not replaced, the next part of this procedure should be completed injecting a CW of 7500 MHz at -11 dB in to J1.			ОК	ок					
14.	Command the LNA on-line that is closest to normal specification (51 dB). Record which LNA is selected.			LNA A or LNA B	LNA A					
15.	Command BD	OC A on-line.		OK	ОК					
16.	Monitor J72 a that the cable	t the Downlink Patch Panel with loss is accounted for at 1200 M	n a Spectrum Analyzer. Ensure /IHz.	ОК	ок					
17.	Adjust the gai	n of BDC A until -10 dBm is me	easured at J72.	OK	ОК					
18.	Command BD	OC B on-line.		ОК	ОК					
19.	Adjust the gai	n of BDC B until -10 dBm is me	easured at J72.	OK	ОК					
20.	Slide out the I	Downlink Patch Panel and remo	ove the top cover.	OK	ОК					
21.	Monitor J40 at the Downlink Patch Panel with a Spectrum Analyzer. Ensure that the cable loss is accounted for at 1200 MHz.			ОК	ОК					
22.	Adjust the gai cable W231 J	n of the T-2 Downlink Amplifier 8 on EBEM 1 (Patch Modem 1	ОК	ОК						
23.	Command BD	DC A online.		ОК	ок					
	PROCEDURE / REPORT OF TEST Nº 7.5.1									
--	---	---	--	--------------------------	--------	-----------	--	--	--	--
TEST NAME: T-2 LNA Gain and Receive Chain Level Alignment		ELEMENT UNDER TEST: RX Subsystem		Serial № and/or version:						
		TEST CONDUCTOR:	TEST CONDUCTOR: QA ENG: CUSTOMER:			DATE END:				
STEP	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS				
24.	Adjust the gain of the T-2 Downlink Amplifier until 0 dBm is measured at cable W231 J8 on EBEM 1.			ок	ок					
25.	Remove test of	equipment and normalise the T	-2 downlink.	ОК	ок					
26.	Connect a Multimeter to the T-2 LNA A test point on top of the LNA Controller, Check and Adjust POT as required. Record the result.			6.5 VDC	VDC					
27.	Connect a Mu Controller, Ch	Iltimeter to the T-2 LNA B test p leck and Adjust POT as require	point on top of the LNA d. Record the result.	6.5 VDC	VDC					

7.5.2 <u>T-1 LNA Gain and Receive Chain Level Alignment</u>

The procedures in this section are summarized in the T-1 Receive System figure below.



Set T-1 RECEIVE GAIN to 105 dB

1a. If at least one LNA is found to be in specification during testing, inject 7500 MHz CW at a level of -56 dBm into LNA input and use that LNA for the rest of the procedure.

1b. If both LNAs are found to be out of specification during testing, inject 7500 MHz CW at a level of -5 dBm into J1 of LNA Bulkhead Assembly.

2. Adjust the gain of each BDC to achieve a level of -10 dBm at J76 of Downlink L-Band Patch Panel.

3. Adjust the gain of the L-Band Amplifer in the Downlink L-Band Patch Panel to achieve a level of 0 dBm at the input to EBEM Modem #1.

	PROCEDURE / REPORT OF TEST Nº 7.5.2								
TEST NAME: T-1 LNA Gain and Receive Chain Level Alignment			IENT UNDER TEST: TX Subs	system	Serial № and/or version	:			
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP	P TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS			
1.	Point the T-1 ante	nna to cold sky.		ОК	ОК				
2.	Command LNA A	on-line		ОК	ОК				
3.	Configure and calibrate Network Analyzer to inject a swept 7500 MHz \pm 250 MHz at -62 dBm with measurements of 502 points, 0.996 MHz at DC3. (Set input level to account for DC3 Coupling Factor)			ОК	ок				
4.	Adjust Network Analyzer settings to: 1. Averaging = 10 2. Smoothing = 2 3. IF BW = 30K 4. Scale Per Div = 1 5. Coupler Factor Offset			ОК	ок				
5.	Connect the Netw	ork Analyzer port 1 inject cable	e to DC3.	ОК	ОК				
6.	Connect the Netw	ork Analyzer port 2 receive cal	ole to J1 at the LNA Plate.	ОК	ОК				
7.	On the Network Aland 7750 MHz)	nalyzer, activate markers, low-	mid-high band. (7250, 7500	ОК	ок				
8.	Record LNA A gai	n at 7500 MHz.		>50 dB	dB				
9.	Capture Network	Analyzer Trace for the LNA A a	and paste it below.	ОК	ОК				
Paste LNA-A > Amplitude Res				sponse JPG here.					
10.	Command LNA B	on-line		OK	ОК				
11.	Record LNA B gai	n at 7500 MHz.		>50 dB	dB				
12.	Capture Network	Analyzer Trace for the LNA B a	and paste it below.	ОК	ОК				

PROCEDURE / REPORT OF TEST Nº 7.5.2									
TEST NAI and Rece Alignment	TEST NAME: T-1 LNA Gain and Receive Chain Level Alignment			system Serial Nº and/or version:					
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS			
	Paste LNA-B > Amplitude Response JPG here.								
13.	 Inject a CW of 7500 MHz ± 250 MHz at -62 dBm (Set input level to account for DC3 Coupling Factor). Note: If both LNAs are below specification and not replaced, the next part of this procedure should be completed injecting a CW of 7500 MHz at -5 dB in to J1. 			ок	ок				
14.	Command the LNA on-line that is closest to normal specification (51 dB). Record which LNA is selected.			LNA A or LNA B	LNA A				
15.	Command BDC A on-line.			ОК	ОК				
16.	Monitor J76 at the that the cable loss	Downlink Patch Panel with a Sp is accounted for at 1200 MHz.	ectrum Analyzer. Ensure	ОК	ок				
17.	Adjust the gain of	BDC A until -10 dBm is measure	d at J76.	ОК	ОК				
18.	Command BDC B	on-line.		ОК	ОК				
19.	Adjust the gain of	BDC B until -10 dBm is measure	d at J76.	ОК	ОК				
20.	Slide out the Dowr	nlink Patch Panel and remove the	e top cover.	ОК	ОК				
21.	Monitor J56 at the that the cable loss	Downlink Patch Panel with a Sp is accounted for at 1200 MHz.	ectrum Analyzer. Ensure	ОК	ок				
22.	Adjust the gain of cable W231 J8 on	the T-1 Downlink Amplifier until (EBEM 1 (Patch Modem 1 for T-) dBm is measured at 1 receive operation).	ОК	ок				
23.	Command BDC A	online.		ОК	ОК				
24.	Adjust the gain of cable WXXX J8 or	the T-1 Downlink Amplifier until (BEBM 1.) dBm is measured at	ОК	ок				

	PROCEDURE / REPORT OF TEST Nº 7.5.2								
TEST NAME: T-1 LNA Gain and Receive Chain Level Alignment		ELEMENT UNDER TEST: TX Subsystem			Serial № and/or version:				
		TEST CONDUCTOR: QA ENG: CUSTOMER:			DATE START:	DATE END:			
STEP	TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS				
25.	Remove test equip	oment and normalise the T-2 do	ownlink.	ОК	ок				
26.	Connect a Multimeter to the T-1 LNA A test point on top of the LNA Controller, Check and Adjust POT as required. Record the result.			6.5 VDC	VDC				
27.	Connect a Multimeter to the T-1 LNA B test point on top of the LNA Controller, Check and Adjust POT as required. Record the result.			6.5 VDC	VDC				

7.6 RX Amplitude Response

7.6.1 <u>T-2 Rx Amplitude Response</u>

	PROCEDURE / REPORT OF TEST Nº 7.6.1									
TEST Amplit	NAME: T-2 Rx tude Response	ELEMENT UNDER TEST: T-2 Rx Subsystem		ubsystem	Serial № and/or version:					
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS				
1.	Point the T-2 the antenna to cold sky.									
2.	Configure and calibrate Network Analyzer to inject a swept 7500 MHz ± 250 MHz at -62 dBm with measurements of 502 points, 0.996 MHz at DC3. (Set input level to account for DC3 Coupling Factor)			ОК	ок					
3.	 Adjust Network Analyzer settings to: 1. Averaging = 10 2. Smoothing = 2 3. IF BW = 30K 4. Scale Per Div = 1 5. Coupler Factor Offset 			ОК	ок					
4.	Connect the Netw	ork Analyzer port 1 inject cable	e to DC3.	OK	ОК					
5.	Connect the Netw L-Band Patch Par	ork Analyzer port 2 receive cal nel and patch Modem 1 for T-2	ole to J40 of the Downlink receive operation.	ОК	ок					
6.	Command LNA A	on-line and BDC A on-line		OK	ОК					
7.	Command BDC A	on-line		OK	ОК					
8.	On the Network Analyzer, activate markers, low-mid-high band. (950, 1200 and 1450 MHz)			ОК	ок					
9.	T-2 LNA A - BDC	A, save the trace as a JPEG a	nd paste below.	Max P-P variation is 5 dB (+/- 2.5 dB).	ОК					
		Paste	the LNA A - BDC A Amplitude	e Response JPEG Here						

		F	PROCEDURE / REPOR	T OF TEST № 7.6.1		
TEST Amplit	TEST NAME: T-2 RxELEMENTAmplitude ResponseELEMENT		T UNDER TEST: T-2 R	x Subsystem	Serial Nº and/or version:	
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS
10.	10. Command BDC B on-line			ОК	ОК	
11.	. T-2 LNA A - BDC B, save the trace as a JPEG and paste below.			Max P-P variation is <mark>5</mark> dB (+/- 2.5 dB).	ОК	
		Paste th	e LNA A - BDC B Ampl	tude Response JPEG Here		
12.	Command LNA B	on-line		ОК	ОК	
13.	T-2 LNA B - BDC	B, save the trace as a JPEG and	d paste below.	Max P-P variation is <mark>5</mark> dB (+/- 2.5 dB).	ОК	
		Paste th	e LNA B - BDC B Ampl	tude Response JPEG Here		
14.	Command BDC A	A on-line		ОК	ОК	
15.	T-2 LNA B - BDC A, save the trace as a JPEG and paste below.			Max P-P variation is <mark>5</mark> dB (+/- 2.5 dB).	ок	
		Paste th	e LNA B - BDC A Ampl	tude Response JPEG Here		
16.	Command LNA A	on-line.		ОК	ОК	

7.6.2 <u>T-1 Rx Amplitude Response</u>

	PROCEDURE / REPORT OF TEST Nº 7.6.2									
TEST I Ampliti	NAME: T-1 Rx ude Response	ELEMEN	T UNDER TEST: T-1 Rx Su	ubsystem	Serial Nº and/or versio	n:				
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS				
1.	Point the T-1 the antenna to cold sky.									
2.	 Configure and calibrate Network Analyzer to inject a swept 7500 MHz ± 250 MHz at -56 dBm with measurements of 502 points, 0.996 MHz at DC3. (Set input level to account for DC3 Coupling Factor) 			ОК	ок					
3.	Adjust Network Analyzer settings to: 1. Averaging = 10 2. Smoothing = 2 3. IF BW = 30K 4. Scale Per Div = 1 5. Coupler Factor Offset			ОК	ок					
4.	Connect the Netw	vork Analyzer port 1 inject cable to	o DC3.	OK	ОК					
5.	Connect the Netw L-Band Patch Pa	vork Analyzer port 2 receive cable nel and patch Modem 1 for T-1 re	e to J56 of the Downlink ceive operation.	ОК	ок					
6.	Command LNA A	on-line and BDC A on-line		OK	ОК					
7.	Command BDC A	A on-line		OK	ОК					
8.	On the Network A and 1450 MHz)	Analyzer, activate markers, low-m	id-high band. (950, 1200	ОК	ок					
9.	T-1 LNA A - BDC A, save the trace as a JPEG and paste below.			Max P-P variation is 5 dB (+/- 2.5 dB).	ок					
		Paste th	e LNA A - BDC A Amplitude	e Response JPEG Here						
10.	Command BDC E	3 on-line		ОК	ОК					

	PROCEDURE / REPORT OF TEST № 7.6.2								
TEST Amplit	NAME: T-1 Rx tude Response	ELEME	NT UNDER TEST: T-1 Rx	Subsystem	Serial № and/or version:				
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
STEP	STEP TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS			
11.	T-1 LNA A - BDC	B, save the trace as a JPEG ar	nd paste below.	Max P-P variation is <mark>5</mark> dB (+/- 2.5 dB).	ОК				
		Paste t	the LNA A - BDC B Amplit	ude Response JPEG Here					
12.	Command LNA B	on-line		ОК	ОК				
13.	T-1 LNA B - BDC	B, save the trace as a JPEG ar	nd paste below.	Max P-P variation is <mark>5</mark> dB (+/- 2.5 dB).	ок				
		Paste t	the LNA B - BDC B Amplit	ude Response JPEG Here					
14.	Command BDC A	on-line		ОК	ОК				
15.	T-1 LNA B - BDC A, save the trace as a JPEG and paste below.			Max P-P variation is <mark>5</mark> dB (+/- 2.5 dB).	ок				
		Paste t	the LNA B - BDC A Amplit	ude Response JPEG Here					
16.	Command LNA A	on-line.		ОК	ОК				

8 FUNCTIONALITY CHECKS

8.1 ASNMC Functionality Test

	PROCEDURE / REPORT OF TEST Nº 8.1									
TEST NA Functionality	AME: ASNMC		ELEMENT UNDER TEST: ASN	MC	AC Serial № and/or version:					
PROJECT:	TEST	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
ISGI	MATRIX:									
STEP	STEP TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS				
1	1.6.1_20150127_	_NU_ASNMC_Functionalty_	_Test_Procedure		ОК					
1.	Open Computer and check Fan operations clean inlet and outlets									
2.	Check available Backup batteries and replace if needed				ОК					
3.	Check ASNMC Computer is having latest version installed and functioning			Win7 prof.	ОК					
	properly			ASNMC Ver.1.2.1						
4.	Check ASNMC C installed and fund	Computer is having latest de ctioning properly	sktop NCIA BG Info logo		ок					
5.	Check the IP con address.	figuration recording to be su	ure the MACS has the proper IP		ок					
6.	Check RDP (Ren	note Desk Top operation) F	unctioning properly		ОК					
7.	Check SMS kit Ir	nstallation performed and Po	orts are configured.		N/A					
8.	Check iDirect EC	W modem is reachable via	ASNMC Computer.		ОК					
	Download modem configuration to desktop and check modem is having latest operational option file loaded. (desired for dedicated Network)									
9.	Configure EOW i CW, CF 950 MH;	Direct modem of the ASNM z, Output power -15 dBm.	C or signal generator as follow;		ок					

	PROCEDURE / REPORT OF TEST № 8.1								
TEST NAME: ASNMC Functionality			ELEMENT UNDER TEST: ASNI	ЛС	Serial Nº and/or version	:			
PROJECT:	TEST	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
ISGI	MATRIX:								
STEP		TEST SEQUEN	CE CE	EXPECTED RESULT	RESULT	REMARKS			
10.	Configure setup for T-1, measure the CW signal at the TX Power out port of the T-1 Antenna.			LBAND /XBAND					
				-23.5 dBm /33.0 dBm					
	CF 1200 MHz	CF 1200 MHz							
	CF 1450 MHz			-23.5 dBm /33.0 dBm					
11.	Configure setup f	for T-2, measure on "RF TX (OUT", apply measurements for	LBAND /XBAND					
	CF 950 MHz	d the value measured.		-23.5 dBm /39.0 dBm					
	CF 1200 MHz			-23.5 dBm /39.0 dBm					
	CF 1450 MHz			-23.5 dBm /39.0 dBm					
12.	Go to the right satellite (depending on the option file) and make sure that the IDirect modem gets Rx lock. The most left LED will be steady green. Switch the HPAs combined to antenna and wait till all LEDs on the modem are steady green Capture print screen of iDirect on ASNMC GUI.			Sync/ All LEDs green	ок				

PROCEDURE / REPORT OF TEST № 8.1							
TEST NA Functionality	ME: ASNMC		ELEMENT UNDER TEST: ASNMC			n:	
PROJECT:	TEST	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:	
TSGT	MATRIX:						
STEP	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS	
		# Idirect [Connecte	d]				
Idirect General alarm Normal							
	Tx Tx rate (Kbps) 1015.313 Tx type Burst Tx state Enabled Tx modulation QPSK Tx FEC TPC0.793 RF ON RF OFF				off		
		Rx rate (Kbps)	1015.313 Rx type 3 Rx freq. (MHz) 14 Rx modulation 0 Rx FEC TP	SCPC Rx state Ena 30.458 SNR (dB) 8 QPSK Rx AGC (dBm) -24 C0.793 -24	bled .9 .15		
		Common Status Network Temperature (°C)	Normal Access N Enabled 39	lormal Re	eset		
13.	Logon to the LCA Double click on th window, NCCA a Capture print scre	and start the ASNMC softw e NCCx Access field and r nd NCCP access is availabl een of NCCx Access on ASI	vare. nake sure that, in the resulting e over ICC. NMC GUI.		ок		

PROCEDURE / REPORT OF TEST № 8.1									
TEST NA Functionality	ME: ASNMC		ELEMENT UNDER TEST	: ASNI	ЛС		Serial № and/or	r version:	
PROJECT:	TEST	TEST CONDUCTOR:	QA ENG:		CUSTOMER:		DATE START:		DATE END:
1301									
STEP		TEST SEQUEN	CE		EXPECTED RES	SULT	RESULT	•	REMARKS
		MCCx Access [Conne	ected]				3		
		NCCx Access	General alarm		Normal				
			ASNMC router interfa	aces –					
			NR LAN		Available				
			NGCS VRF		Available				
			EMS VRF		Available				
				NCO	A 200000				
		NCCP def. active rou	te ICC	N	CA def. active route	Nor	ne		
		NCCP via ICC	Available	N	CCA via ICC	Avail	able		
		NCCP ICC hub	F11	N	CCA ICC hub	F1	.1 vilable		
		NCCP via EMS	Unavailable	N	CCA via EMS	Unava	ilable		
14.	Connect the SNO on the extended	M NR IP phone to the dedic Direct modem port perform	cated port on the EloW cha a functionality test	annel			ОК		
15.	Establish connectivity between the ASNMC VPN router and the remote post connect SNOM NU IP phone to the dedicated port on the remote port SW and perform a functionality test						ОК		
16.	Establish connect remote ASNMC c perform a functior	Establish connectivity between the ASNMC VPN router and connect the emote ASNMC computer to the dedicated port on the Remote port SW and perform a functionality test					ок		
17.	Establish connect M&C computer ar	ivity between the ORION M nd perform a functionality te	&C switch and the remote st				ОК		

	PROCEDURE / REPORT OF TEST № 8.1									
TEST NA Functionality	TEST NAME: ASNMC Functionality ELEMENT UNDER TEST: ASNM			/C Serial № and/or version:		:				
PROJECT:	TEST TEST CONDUCTOR: QA ENG:		CUSTOMER:	DATE START:	DATE END:					
TSGT	MATRIX:									
STEP		TEST SEQUEN	CE	EXPECTED RESULT	RESULT	REMARKS				
18.	Log on to ASNM	C DWS computer and check	current ASNMC GUI version	Win7 prof.	ОК					
	for Ver. ASNMC	Ver.1.2.1		ASNMC Ver.1.2.1						
19.	Check ASNMC DWS Computer is having latest desktop NCIA BG. Info logo installed and functioning properly				ок					
20.	Log on VPN ROL Fans and Backup	JTER/SWITCH and Check C battery is keeping configura	Configured Properly. Cooling ation.		ок					

8.2 Modem Tests

8.2.1 EMS CW Carrier Transmission

	PROCEDURE / REPORT OF TEST Nº 8.2.1									
TEST NAME: T-1 only EMS CW carrier transmission.		ELEMENT UNDER TEST: EMS		Serial № and/or version:						
PROJECT:	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
TSGT	4.5 (FAT)									
STEP	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS				
1	1.7.1_20150127_NU_EMS	_Functionalty_Test_Procedure	e		ОК					
••	Open Computer and check Fan operations clean inlet and outlets									
2.	Check EMS Computer and VM is having latest Firmware/SW installed and communicating			V.02.01.12	ОК					

		Pf	ROCEDURE / REPORT C	F TES	Γ № 8.2.1			
TEST NAME transmission	T-1 only EMS CW carrier	I	ELEMENT UNDER TEST	: EMS		Serial Nº and/or version	1:	
PROJECT:	TEST MATRIX:	TEST MATRIX: TEST CONDUCTOR:		CUSTOMER:		DATE START:	DATE END:	
1301	4.5 (FAT)							
STEP		TEST SEQUENCE		EX	PECTED RESULT	RESULT	REMARKS	
3.	Check EMS 8U Modem Rack is having latest Firmware/SW installed and communicating logging-on to LMC, launch LMS. > <i>Display MR autotest</i> :							
	Component	Version	Sub-componen	nt	Version			
			LIA		V3.01			
			BOOTPP		V4.09			
	EMU	EMU V9.6	V9.6	TESTCAGE		V5.28		
		0			V1.15			
			LCTL-EMU		V9.6			
	ECU	V1 1	SMS		V1.1			
	200	¥1.1	STS		V1.1			
			FPGATEST		01.01			
			FPGAMFC2 ¹		02.10			
			BOOTPP		05.03			
		Ed2	DSP_LPP		03.03			
	00002.0	V3.05	DSP_NEMS ²		03.22			
			DSP_TEST		03.02			
			LOG_OPE		12K20			
			LIA		04.04	_		
11.	Check all CU cards working	Properly		On	y 8U Modem Rack	ОК		
12.	Check all PSUs are working	Properly		On	y 8U Modem Rack	OK		
13.	Check cooling fan Try coolir	ng Properly		On	y 8U Modem Rack	ОК		
9.	Replace the back-up battery. Apply a battery replacement label on the board.			On	y 8U Modem Rack	ОК		
10.	Apply 10 MHz reference cal	ibration on 8U Modem R	ack			ОК		

PROCEDURE / REPORT OF TEST Nº 8.2.1								
TEST NAME: T-1 only EMS CW carrier transmission.		ELEM	IENT UNDER TEST	: EMS	Serial Nº and/or version	n:		
PROJECT:	TEST MATRIX:	TEST CONDUCTOR:	TEST CONDUCTOR: QA ENG: CUSTOMER:		DATE START:	DATE END:		
1301	4.5 (FAT)							
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
		SET THE FREQUENCY	COUNTER					
			R96	Adjusting potentiometer	ence Inter			

PROCEDURE / REPORT OF TEST Nº 8.2.1								
TEST NAME: T-1 only EMS CW carrier transmission.		ELEN	IENT UNDER TEST	T: EMS	Serial Nº and/or version	1:		
PROJECT:	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
1301	4.5 (FAT)							
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
	Select Up-converter A ON- Configure modem EPM, CI -15 dBm.	LINE and SSPA A + B ON-LIN U1 as follow; CW, CF 1200 MH	NE. Hz, Output power	LBAND TX:-16.8 dBm				
	Connect the power meter s and measure the level. Make a LBAND BNC loop	sensor to LBAND P/P EMSe1 a	and Enable CW Patch Panel.	LBAND RX:-17.5 dBm				
14.	14. Make a LBAND BNC loop from UPLINK to/DOWNLINK Patch Panel. 14. Record the RX Power Level on the LMS as seen below. Connect the power sensor to X BAND RF test Panel and Enable CW and measure the level. (Coupler 57dbc) Record the measured value for CF 950 MHz -15 dBm. Record the measured value for CF 1450 MHz -15 dBm. Install TX ,RX RF Chain for CUs.			X -BAND TX T-1:+40.0 dBm X- BAND TX T-2:+46.0 dBm				
				ок				

PROCEDURE / REPORT OF TEST Nº 8.2.1								
TEST NAME: transmission.	T-1 only EMS CW carrier	ELEM	ELEMENT UNDER TEST: EMS			Serial Nº and/or version:		
PROJECT:	TEST MATRIX:	TEST CONDUCTOR: QA ENG:		CUSTOMER:	DATE START:	DATE END:		
1301	4.5 (FAT)							
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
		Terminal OLGX.72 Protected Image: Constraint of the state of the st	Links Links list Links list Links nam	es Primary Modern Backup Modern Status Tx Rx Term				

PROCEDURE / REPORT OF TEST № 8.2.1								
TEST NAME: T-1 only EMS CW carrier transmission.		ELEN	MENT UNDER TEST	EMS	Serial Nº and/or version	1:		
PROJECT:	TEST MATRIX:	TEST MATRIX: TEST CONDUCTOR: QA ENG:		CUSTOMER:	DATE START:	DATE END:		
1001	4.5 (FAT)							
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
	Select Up-converter A ON-LINE and SSPA A + B ON-LINE. Configure modem EPM, CU2 as follow; CW, CF 1200 MHz, Output power -15 dBm.			LBANDTX:-16.8 dBm				
	Connect the power meter s and measure the level.	sensor to LBAND P/P EMSe1 a	and Enable CW	LBAND RX:-17.5 dBm				
Make a LBAND BNC loop from UPLINK to/DOWNLINK Patch Panel. Record the RX Power Level on the LMS as seen below. Connect the power sensor to X BAND RF test Panel and Enable CW and measure the level. (Coupler 57dbc) Record the measured value for CF 950 MHz -15 dBm. Record the measured value for CF 1450 MHz -15 dBm.			X -BAND TX T-1:+40.0 dBm X- BAND TX T-2:+46.0 dBm					
				ок				

PROCEDURE / REPORT OF TEST Nº 8.2.1								
TEST NAME: T-1 only EMS CW carrier transmission.	ELEM	ENT UNDER TEST	: EMS	Serial Nº and/or version	Serial № and/or version:			
PROJECT: TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
4.5 (FAT)								
STEP	TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS			
	THALES LMS 11:49:30	P. Moder	ss	Terminal				

	PROCEDURE / REPORT OF TEST Nº 8.2.1								
TEST NAME transmission	T-1 only EMS CW carrier	ELEM	MENT UNDER TEST	: EMS	Serial Nº and/or version	Serial Nº and/or version:			
PROJECT:	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:			
1301	4.5 (FAT)								
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS			
	Select Up-converter A ON-LINE and SSPA A + B ON-LINE. Configure modem EPM, CU3 as follow; CW, CF 1200 MHz, Output power -15 dBm. Connect the power meter sensor to LBAND P/P EMSe1 and Enable CW and measure the level.			LBANDTX:-16.8 dBm					
				LBAND RX:-17.5 dBm					
16	Make a LBAND BNC loop from UPLINK to/DOWNLINK Patch Panel. Record the RX Power Level on the LMS as seen below. Connect the power sensor to X BAND RF test Panel and Enable CW and measure the level. (Coupler 57dbc) Record the measured value for CF 950 MHz -15 dBm. Record the measured value for CF 1450 MHz -15 dBm.			X -BAND TX T-1:+40.0 dBm X- BAND TX T-2:+46.0 dBm					
				ок					

PROCEDURE / REPORT OF TEST Nº 8.2.1								
TEST NAME: ^T transmission.	T-1 only EMS CW carrier	ELEM	IENT UNDER TEST	EMS	Serial Nº and/or version	Serial № and/or version:		
PROJECT:	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
ISGI	4.5 (FAT)							
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
			Links Isr	LMS - Carrier wave mode on CU 1.4 Tx Power (atlm): Tx Frequency (MHz) Rx Power (atlm): Rx Power (atlm): Rx Power (atlm): Rx Power (atlm): Rx Frequency (MHz) Rx Frequency (MHz) R	Terminal			

PROCEDURE / REPORT OF TEST № 8.2.1								
TEST NAME: T-1 only EMS CW carrier transmission.		ELEN	MENT UNDER TEST	EMS	Serial Nº and/or version	1:		
PROJECT:	TEST MATRIX:	ST MATRIX: TEST CONDUCTOR: QA ENG:		CUSTOMER:	DATE START:	DATE END:		
1001	4.5 (FAT)							
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
	Select Up-converter A ON-LINE and SSPA A + B ON-LINE. Configure modem EPM, CU4 as follow; CW, CF 1200 MHz, Output power -15 dBm			LBANDTX:-16.8 dBm				
	Connect the power meter s and measure the level.	sensor to LBAND P/P EMSe1 a	and Enable CW	LBAND RX:-17.5 dBm				
17	Make a LBAND BNC loop from UPLINK to/DOWNLINK Patch Panel. Record the RX Power Level on the LMS as seen below. Connect the power sensor to X BAND RF test Panel and Enable CW and measure the level. (Coupler 57dbc) Record the measured value for CF 950 MHz -15 dBm. Record the measured value for CF 1450 MHz -15 dBm.			X -BAND TX T-1:+40.0 dBm X- BAND TX T-2:+46.0 dBm				
				ок				

PROCEDURE / REPORT OF TEST Nº 8.2.1								
TEST NAME: transmission.	T-1 only EMS CW carrier	ELEM	ENT UNDER TEST	: EMS	Serial Nº and/or version	n:		
PROJECT: TSGT	TEST MATRIX: 4.5 (FAT)	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
		OLGX.TZ Protocced Image: Constraint of the state of t	P. Mo	S - Carrier wave mode on CU 1.5 Ts Power (dBm): 18 For 1U. range Tx Prequency (MHz) 1200 For U. range Tx Prequency (MHz) 1200 Control				

PROCEDURE / REPORT OF TEST Nº 8.2.1								
TEST NAME: T-1 only EMS CW carrier transmission.		ELEN	IENT UNDER TEST	EMS	Serial Nº and/or version:			
PROJECT: TSGT	TEST MATRIX: 4.5 (FAT)	TEST CONDUCTOR: QA ENG:		CUSTOMER:	DATE START:	DATE END:		
STEP	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS		
Select Up-converter A ON-LINE and SSPA A + B ON-LINE. Configure modem EPM, CU5 as follow; CW, CF 1200 MHz, Output power				LBANDTX:-16.8 dBm				
	-15 dBm. Connect the power meter s and measure the level.	ensor to LBAND P/P EMSe1 a	and Enable CW	LBAND RX:-17.5 dBm				
18	Make a LBAND BNC loop f Record the RX Power Leve Connect the power sensor measure the level. (Couple Record the measured value Record the measured value	from UPLINK to/DOWNLINK F el on the LMS as seen below. to X BAND RF test Panel and er 57dbc) e for CF 950 MHz -15 dBm. e for CF 1450 MHz -15 dBm.	X -BAND TX T-1:+40.0 dBm X- BAND TX T-2:+46.0 dBm					
				ок				

PROCEDURE / REPORT OF TEST Nº 8.2.1								
TEST NAME transmission	T-1 only EMS CW carrier	ELEM		I: EMS	Serial Nº and/or version	ו:		
PROJECT: TSGT	TEST MATRIX: 4.5 (FAT)	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
			P. M	adems				
	Establish a test configuration	on and apply on-line test.			N/R			
5.	Check EMSe 1U Modems 1 is having latest Firmware/SWS installed and communicating			Version V1.2.1 with ETX upgrade to V4.3.23				
6.	Check EMSe 1U Modems 2 is having latest Firmware/SWS installed and communicating			Version V1.2.1 with ETX upgrade to V4.3.23				
7.	Check EMSe 1U Modems communicating	3 is having latest Firmware/SW	'S installed and	Version V1.2.1 with ETX upgrade to V4.3.23				

		PROCE	EDURE / REPORT	OF TEST № 8.2.1		
TEST NAME transmission	TEST NAME: T-1 only EMS CW carrier ELEMENT UNDER TEST transmission. ELEMENT UNDER TEST		ST: EMS	Serial Nº and/or version:		
PROJECT: TSGT	TEST MATRIX: 4.5 (FAT)	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
STEP	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS
8.	Check EMSe 1U Modems 4 is having latest Firmware/SWS installed and communicating			Version V1.2.1 with ETX upgrade to V4.3.23		
	Apply 10 MHz reference ca	alibration on 1U Modem#1			ОК	
	Apply 10 MHz reference calibration on 1U Modem#2				ОК	
	Apply 10 MHz reference calibration on 1U Modem#3				ОК	
	Apply 10 MHz reference ca	alibration on 1U Modem#4			ОК	
	 Select Up-converter A ON-LINE and SSPA A + B ON-LINE. Configure modem EPM, TU1, (EMSe #1) as follow; CW, CF 1200 MHz, Output power -15 dBm. Connect the power meter sensor to LBAND P/P EMSe1 and Enable CW and measure the level. Make a LBAND BNC loop from UPLINK to/DOWNLINK Patch Panel. Record the RX Power Level on the LMS as seen below. Connect the power sensor to X BAND RF test Panel and Enable CW and measure the level. (Coupler 57dbc) Record the measured value for CF 950 MHz -15 dBm. Record the measured value for CF 1450 MHz -15 dBm. Install TX,RX RF Chain for CUs. 			LBANDTX:-16.8 dBm		EMSe1
14.				LBAND RX:-17.5 dBm X -BAND TX T-1:+40.0 dBm X- BAND TX T-2:+46.0 dBm		
				ок		

PROCEDURE / REPORT OF TEST Nº 8.2.1								
TEST NAME: T-1 only EMS CW carrier transmission.		ELEM	ENT UNDER TEST	: EMS	Serial Nº and/or version:			
PROJECT: TSGT	TEST MATRIX: 4.5 (FAT)	TEST CONDUCTOR:	TEST CONDUCTOR: QA ENG: CUSTOMER:			DATE END:		
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
		Yew Jerminal Control and Monitoring Mar Configurations ↓ Cocal ↓ Default 1.00 (Provisionr ↓ OLUXTI ↓ Local ↓ Pre-configurations ↓ Default 1.00 (Provisionr	P. Modems	Protected Moderns Window	22 23 20 20			

PROCEDURE / REPORT OF TEST Nº 8.2.1								
TEST NAME transmission	T-1 only EMS CW carrier	ELEN	IENT UNDER TEST	: EMS	Serial Nº and/or version	Serial Nº and/or version:		
PROJECT:	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
1301	4.5 (FAT)							
STEP		TEST SEQUENCE			RESULT	REMARKS		
Select Up-converter A ON-LINE and SSPA A + B ON-LINE.				LBANDTX:-16.8 dBm		EMSe2		
	Configure modem EPM, TU Output power	J2, (EMSe #2) as follow; CW, (CF 1200 MHz,					
	-15 dBm.							
	Connect the power meter s and measure the level.	ensor to LBAND P/P EMSe1 a	and Enable CW					
	Make a LBAND BNC loop f	from UPLINK to/DOWNLINK P	atch Panel.	LBAND RX:-17.5 dBm				
	Record the RX Power Leve	el on the LMS as seen below.						
14.	Connect the power sensor measure the level. (Couple Record the measured value	to X BAND RF test Panel and r 57dbc) e for CF 950 MHz -15 dBm.	Enable CW and	X -BAND TX				
	Record the measured value	e for CF 1450 MHz -15 dBm.		1-1.+40.0 abiii				
	Install TX,RX RF Chain for	CUs.		X- BAND TX				
				T-2:+46.0 dBm				
				ОК				

PROCEDURE / REPORT OF TEST Nº 8.2.1								
TEST NAME: T-1 only EMS CW carrier transmission.		ELEM	ENT UNDER TEST	: EMS	Serial Nº and/or version:			
PROJECT: TSGT	TEST MATRIX: 4.5 (FAT)	TEST CONDUCTOR:	TEST CONDUCTOR: QA ENG: CUSTOMER:			DATE END:		
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
		Yew Jerminal Control and Monitoring Mar Configurations ↓ Cocal ↓ Default 1.00 (Provisionr ↓ OLUXTI ↓ Local ↓ Pre-configurations ↓ Default 1.00 (Provisionr	P. Modems	Protected Moderns Window	22 23 20 20			

PROCEDURE / REPORT OF TEST Nº 8.2.1								
TEST NAME transmission	T-1 only EMS CW carrier	ELEN	IENT UNDER TEST	: EMS	Serial Nº and/or version	Serial Nº and/or version:		
PROJECT:	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
1301	4.5 (FAT)							
STEP		TEST SEQUENCE			RESULT	REMARKS		
Select Up-converter A ON-LINE and SSPA A + B ON-LINE.				LBANDTX:-16.8 dBm		EMSe3		
	Configure modem EPM, TU Output power	J3, (EMSe #3) as follow; CW, (CF 1200 MHz,					
	-15 dBm.							
	Connect the power meter s and measure the level.	ensor to LBAND P/P EMSe1 a	and Enable CW					
	Make a LBAND BNC loop f	from UPLINK to/DOWNLINK P	atch Panel.	LBAND RX:-17.5 dBm X -BAND TX				
	Record the RX Power Leve	el on the LMS as seen below.						
14.	Connect the power sensor measure the level. (Couple Record the measured value	to X BAND RF test Panel and r 57dbc) e for CF 950 MHz -15 dBm.	Enable CW and					
	Record the measured value	e for CF 1450 MHz -15 dBm.		T-1:+40.0 dBm				
	Install TX,RX RF Chain for	CUs.		X- BAND TX				
				T-2:+46.0 dBm				
				ОК				

PROCEDURE / REPORT OF TEST Nº 8.2.1								
TEST NAME: T-1 only EMS CW carrier transmission.		ELEM	ENT UNDER TEST	EMS	Serial Nº and/or version:			
PROJECT: TSGT	TEST MATRIX: 4.5 (FAT)	TEST CONDUCTOR:	TEST CONDUCTOR: QA ENG: CUSTOMER:			DATE END:		
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
		View Jerminal Control and Monitoring Ma Configurations Course Cou	r P. Modems P. Modems P. Modems CLMS - Carrier wav Tx Power (dBm): Tx Frequency (M Rx Frequency (M	Protected Modems Window	≥ :0] :5]			

PROCEDURE / REPORT OF TEST Nº 8.2.1								
TEST NAME transmission	T-1 only EMS CW carrier	ELEN	IENT UNDER TEST	EMS	Serial Nº and/or version	Serial № and/or version:		
PROJECT: TSGT	TEST MATRIX:	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
	4.5 (FAT)							
STEP		TEST SEQUENCE			RESULT	REMARKS		
	Select Up-converter A ON-LINE and SSPA A + B ON-LINE.			LBANDTX:-16.8 dBm		EMSe4		
	Configure modem EPM, TU Output power	J4, (EMSe #4) as follow; CW, (CF 1200 MHz,					
	-15 dBm.							
	Connect the power meter sensor to LBAND P/P EMSe1 and Enable CW and measure the level.							
	Make a LBAND BNC loop f	from UPLINK to/DOWNLINK P	atch Panel.	LBAND RX:-17.5 dBm				
	Record the RX Power Leve	el on the LMS as seen below.						
14.	Connect the power sensor	to X BAND RF test Panel and	Enable CW and					
	Record the measured value	e for CF 950 MHz -15 dBm.		X -BAND IX				
	Record the measured value	e for CF 1450 MHz -15 dBm.		T-1:+40.0 dBm				
	Install TX, RX RF Chain for	r CUs.		X- BAND TX				
				T-2:+46.0 dBm				
				ОК				

PROCEDURE / REPORT OF TEST Nº 8.2.1								
TEST NAME: T-1 only EMS CW carrier transmission.		ELEM	ENT UNDER TEST	: EMS	Serial Nº and/or version:			
PROJECT: TSGT	TEST MATRIX: 4.5 (FAT)	TEST CONDUCTOR:	TEST CONDUCTOR: QA ENG: CUSTOMER:			DATE END:		
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
		Yew Jerminal Control and Monitoring Mar Configurations ↓ Cocal ↓ Default 1.00 (Provisionr ↓ OLUXTI ↓ Local ↓ Pre-configurations ↓ Default 1.00 (Provisionr	P. Modems	Protected Moderns Window	22 23 20 20			

8.2.2 EBEM BER Stability Test per ITU- G.821 Standard

This test requires testing each EBEM modem over a satellite link, using either the modem's internal BER test mode or an external BER test set. The first modem test will be run overnight, and the remaining four modems will be run for 20 minutes.

	PROCEDURE / REPORT OF TEST Nº 8.2.2									
TEST NA	ME: BER y Test	ELI	ELEMENT UNDER TEST: Satellite System			Serial № and/or version:				
PROJECT:	TEST	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:				
1561										
STEP		TEST SEQU	ENCE	EXPECTED RESULT	RESULT	REMARKS				
1.	Obtain satellite Access Authorization to link TSGT with other NATO Terminals and / or a NATO Hub Station over a Multilink. Configure system for T-1or T-2 configuration depends on the power requirements Select BUC A and SSPA A + B. Select LNA A and BDC A. Point the Antenna Subsystem at the Satellite.				ок					
2.	Configure I	EBEM1 per the SAA (SAT Loo	p) and verify the modem is locked.		ОК					
3.	Using the E BER test a detected.	BER Tester in the modem or an nd verify test is free of any erro	n external BER test set, start a ors. Inject 1 Error confirm that it is		ок					
4.	Run the test	st overnight and paste both scr on and the test results below.	een capture of the modem		ок					
			Paste EBEM1 configuration and	BER test results here.						
5.	Configure I	EBEM2 per the SAA (SAT Loo	p) and verify the modem is locked.		ОК					
6.	Using the E BER test a detected.	BER Tester in the modem or an nd verify test is free of any erro	n external BER test set, start a ors. Inject 1 Error confirm that it is		ок					

			PROCEDURE / REPORT O	F TEST № 8.2.2		
TEST NA	ME: BER y Test	ELI	EMENT UNDER TEST: Satellite Sys	tem	Serial Nº and/or version	:
PROJECT:	TEST	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:
1501						
STEP		TEST SEQU	ENCE	EXPECTED RESULT	RESULT	REMARKS
7.	Run the ter configuration	st for 20 minutes and paste bot on and the test results below.	h screen capture of the modem		ок	
	·		Paste EBEM2 configuration and E	BER test results here.		·
8.	Configure	EBEM3 per the SAA (SAT Loo	p) and verify the modem is locked.		ОК	
9.	Using the B BER test a detected.	BER Tester in the modem or an nd verify test is free of any erro	n external BER test set, start a ors. Inject 1 Error confirm that it is		ок	
10	Run the tea	st for 20 minutes and paste bot on and the test results below.	h screen capture of the modem		ок	
			Paste EBEM3 configuration and I	BER test results here.		
11.	Configure	EBEM4 per the SAA (SAT Loo	p) and verify the modem is locked.		ОК	
12.	Using the I BER test a detected.	BER Tester in the modem or an nd verify test is free of any erro	n external BER test set, start a ors. Inject 1 Error confirm that it is		ок	
13.	Run the test	st for 20 minutes and paste bot on and the test results below.	h screen capture of the modem		ок	
			Paste EBEM4 configuration and I	3ER test results here.		
14.	Configure	EBEM5 per the SAA (SAT Loo	p) and verify the modem is locked.		ОК	
15.	Using the BER Tester in the modem or an external BER test set, start a BER test and verify test is free of any errors. Inject 1 Error confirm that it is detected.				ок	
16.	Run the test	st for 20 minutes and paste bot on and the test results below.	h screen capture of the modem		ок	
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PROCEDURE / REPORT OF TEST Nº 8.2.2								
TEST NAME: BER stability Test		ELEMENT UNDER TEST: Satellite System			Serial Nº and/or version:			
PROJECT:	TEST	TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
ISGI	MATRIX:							
STEP	TEST SEQUENCE			EXPECTED RESULT	RESULT	REMARKS		
	Paste EBEM5 configuration and BER test results here.							
17.	Re-enter the stored "home-location" mark angle recorded during Antenna Control Subsystem tests:			Home Location Mark Angle:				
	• T-2 ACU (Section 6.1)			T-2 deg.	ок			
	• T-1 ACU (Section 6.2)			T-1 deg.	ОК			

8.3 UPS Battery Check

			PROCEDURE / REPORT O	F TEST № 8.3		
TEST NAME: UPS Battery Check		ELEMENT UNDER TEST: UPS			Serial № and/or version:	
	TEST CONDUCTOR: QA ENG:		CUSTOMER:	DATE START:	DATE END:	
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS
	The UPS runtime to 2.4m and 4.6m RF operating within the second s	test will be performed with the systems transmitting in phase linear region.	SGT configured for the combined mode and			
1.	Point both T-1 and systems in Standb	Point both T-1 and T-2 antennas to cold sky and place both antenna ACU systems in Standby.			ок	
2.	Verify the T-1 TW	Verify the T-1 TWTAs are in Standby mode.			ОК	
3.	Verify the T-2 SSF	Verify the T-2 SSPAs are in Mute mode.			ОК	
4.	Command both the T-2 and T-1 HPA subsystems to Combined Maintenance.			ОК	ок	
5.	Turn on all ECUs, mode.	Turn on all ECUs, set target temperature to force two (2) ECUs to cooling mode.			ок	
6.	Monitor the TSGT AC Power Meter and record kVA.			7.8 kVa	kVa	
7.	Monitor the Inverter SLI50 Controller System Power and record kVA.			2.8 kVa	kVa	
8.	Configure EBEM 1 to Inject -10 dBm, CW, 1200 MHz and patch to the T-2 Uplink.			ОК	ок	
9.	Configure EBEM 2 to Inject -10 dBm, CW, 1200 MHz and patch to the T-1 Uplink.			ОК	ок	
10.	Unmute (Enable) t	Unmute (Enable) the T-2 SSPAs.			ОК	
11.	While monitoring the output power of the SSPAs by means a ASNMC increase the CW signal level of EBEM 1 until both SSPAs are operating at 50.0 dBm.			50.0 dBm	dBm	
12.	Monitor the TSGT AC Power Meter and record kVA.			11.6 kVa	kVa	

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PROCEDURE / REPORT OF TEST Nº 8.3								
TEST NAME: UPS Battery Check		ELEMENT UNDER TEST: UPS		PS	Serial Nº and/or version:			
	TEST CONDUCTOR: QA ENG:		CUSTOMER:	DATE START:	DATE END:			
0755					DE0111 T			
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULI	REMARKS		
13.	Monitor the Inverte	er SLI50 Controller System Pow	ver and record kVA.	6.4 kVa	kVa			
14.	Command both T-	1 TWTAs to Transmit.						
15.	While monitoring the increase the CW s 45.0 dBm.	he output power of the TWTAs signal level of EBEM 2 until both	by means a ASNMC TWTAs are operating at	45.0 dBm	dBm			
16.	Monitor the TSGT AC Power Meter and record kVA.			16.4 kVa	kVa			
17.	Monitor the Inverter SLI50 Controller System Power and record kVA.			11.0 kVa	kVa			
18.	UPS Battery Runtime Test							
	1. Open ma	ain circuit breaker CB1.			ОК			
	2. Note and record start time.				Time:::			
	 Check the current flow with PowCom. It should indicate that it is flowing <u>OUT</u> of the battery as shown in the screen capture below. 			ок				
	4. Monitor b time whe	4. Monitor battery voltage on the Rectifier Controller and record the time when the battery voltage is reduced to 44.0 VDC.			VDC			
	5 minutes	minutes elapses before voltage drops, go to step 5.			min			
	5. Record U	JPS battery run time autonomy.		5 Minutes +				
	Note: The minimu	m capability on UPS power is 5	5 minutes.					

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9 REINSTALL CALIBRATED TEST EQUIPMENT

PROCEDURE / REPORT OF TEST Nº 9.0								
TEST NAME: Test Equipment Install		ELEMENT UNDER TEST: TEST EQUIPMENT		Serial № and/or version:				
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
1.	Confirm SNs, check calibration stickers, and reinstall test equipment and FO reels.							
	WAN Tester			SN OK	ОК			
2.				Installed	ОК			
				CAL Sticker OK	ОК			
				SN OK	ОК			
3.	Power Meter			Installed	ОК			
				CAL Sticker OK	ОК			
				SN OK	ОК			
4.	Power Sensor			Installed	ОК			
				CAL Sticker OK	OK			
	DVM			SN OK	ОК			
5.				Installed	ОК			
				CAL Sticker OK	ОК			
				SN OK	ОК			
6.	Personal Radiation	n Monitor		Installed	ОК			
				CAL Sticker OK	ОК			
				SN OK	ОК			
7.	MCL Attenuator 3	db.		Installed	ОК			
				CAL Sticker OK	OK			

PROCEDURE / REPORT OF TEST Nº 9.0								
TEST NAME: Test Equipment Install		ELEMENT UNDER TEST: TEST EQUIPMENT		Serial Nº and/or version:				
		TEST CONDUCTOR:	QA ENG:	CUSTOMER:	DATE START:	DATE END:		
STEP		TEST SEQUENCE		EXPECTED RESULT	RESULT	REMARKS		
8.	MCL Attenuator 6 db.			SN OK Installed CAL Sticker OK	ОК ОК ОК			
9.	MCL Attenuator 10 db.			SN OK Installed CAL Sticker OK	ОК ОК ОК			
10.	MCL Attenuator 20 db.			SN OK Installed CAL Sticker OK	ОК ОК ОК			
12.	Spectrum Analyzer			SN OK Installed CAL Sticker OK	ок ок ок			
13.	F/O 250meter HMA 4CH.SM			SN OK Installed CAL Sticker OK	ок ок ок			
14.	F/O 250meter HMA 4CH.SM			SN OK Installed CAL Sticker OK	ок ок ок			

10 ARCHIVE REPORT

Archive this test report when it is complete.