



ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
Μόνιμη Αντιπροσωπεία της Ελλάδος
στο ΝΑΤΟ

ΑΔΙΑΒΑΘΜΗΤΟ
ΕΠΕΙΓΟΝ

Αρμόδιος: Ασμχος (ΜΕ) Δημήτριος Κανταρτζόγλου

Βρυξέλλες, 27 Ιουνίου 2021

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ΠΡΟΣ: -ΥΠΕΘΑ/ΓΔΑΕΕ/ΔΑΕΤΕ (μ.η.)

ΚΟΙΝ.: -ΥΠΕΞ/Δ' Γεν. Δ/ντη

-ΥΠΕΞ/Δ2 Δ/νση

-ΓΕΕΘΑ/Γ2 (μ. ΓΕΕΘΑ)

-Υπουργείο Ανάπτυξης (μ.η.)

/Γενική Γραμματεία Εμπορίου

Πλ.Κάνιγγος

-Υπουργείο Ανάπτυξης (μ.η.)

/Γενική Γραμματεία Βιομηχανίας

/Δνση Διεθνών Βιομηχανικών Σχέσεων

Πλ.Κάνιγγος

-Τεχνικό Επιμελητήριο Ελλάδος (μ.η.)

/Δνση Ε Επαγγελματικής Δραστηριότητας

Νίκης 4

ΘΕΜΑ: Πρόσκληση Υποβολής Προσφορών, IFB-CO-115401-TSGT-ISS, Διαγωνιστικής Διαδικασίας, «NATO Transportable Satellite Ground Terminals Third Generation (TSGT3G) and Upgraded Transportable Satellite Ground Terminals (UTSGT) In-Service Support Activities»

1. Διαβιβάζεται, συνημμένως, Πρόσκληση Υποβολής Προσφορών (invitation For Bid/IFB) και σχετικά αυτής, εν θέματι διαγωνιστικής διαδικασίας (International Competitive Bidding/ICB), εκ μέρους ΝCΙΑ, ως φιλοξενούντος έθνους.

2. Καταληκτική ημερομηνία υποβολής προσφορών ορίζεται η 31^η Αυγούστου τ.έ., 14:00 τ.ώ.

3. Ενδιαφερόμενες εταιρίες αναζητήσουν πληροφορίες μέσω καθοριζομένου σημείου επαφής (Point of Contact/ΠOC, βλ. παρ. 17 προσκήσεως).

4. Παρακαλούμε για τις ενέργειές σας.

ΛΑΜΠΡΙΔΗΣ

Συν. Σελ: 736 + 2 ηλεκτρονικά αρχεία φύλλων δεδομένων

ΑΚΡΙΒΕΣ ΑΝΤΙΓΡΑΦΟ
Ο υπάλληλος της Μ.Α. ΝΑΤΟ
Σταύρος Τσάκωνας
ΕΠ&ΠΛ.Α'

Part #	Description	Mftr
N5245A	Test Equipment, Keysight (Agilent) PNX-X Network Analyzer	
E8257D	PSG Analog Signal Generator w/ Rackmount Flange	Agilent
E8257D	Signal Generator, Analog w/ Rackmount Flange	Agilent
N9020A	Spectrum Analyzer w/ Rackmount Flange	Agilent
	Spectrum Analyzer Phase Noise App	Agilent
N4692A	Electronic Calibration Module	Agilent
53150A	Frequency Counter	Agilent
E4418A	Power Meter w/ Rackmount Flange	HP
E4412A	Power Sensor	Agilent
77	Multimeter	Fluke
82357B	USB TO GPIB Adaptor	Agilent
T-BERD 6000A V2	Data Tester/Comms Analyzer	Viavi
	Misc Cables and components for integration	
SLSLL18-NMNM50.00F	RF Test Cable	Times Microwave
SLSLL18-NMNM50.00F	RF Test Cable	Times Microwave
SLSLL18-NMNM28.00F	RF Test Cable	Times Microwave
SLSLL18-NMNM28.00F	RF Test Cable	Times Microwave
SLSLL18-NMNM28.00F	RF Test Cable	Times Microwave
SLSLL18-NMNM20.00F	RF Test Cable	Times Microwave
SLSLL18-NMNM20.00F	RF Test Cable	Times Microwave
SLSLL18-NMNM10.00F	RF Test Cable	Times Microwave
SLSLL18-NMNM10.00F	RF Test Cable	Times Microwave
SLSLL18-NMNM10.00F	RF Test Cable	Times Microwave
SLSLL18-NMNM10.00F	RF Test Cable	Times Microwave
SLSLL18-NMNM10.00F	RF Test Cable	Times Microwave
SLSLL18-NMNM06.00F	RF Test Cable	Times Microwave
SLSLL18-NMNM06.00F	RF Test Cable	Times Microwave
SLSLL18-NMNM06.00F	RF Test Cable	Times Microwave
SLSLL18-NMNM06.00F	RF Test Cable	Times Microwave
	Transit Cases	Times Microwave
Latitude 5420 Rugged	Dell laptop for ATE	Dell
	Rack Mount Flange Kits (may be attached to equipment)	Agilent

SN	Qty	UM	Shipped From
MY49151183	1	EA	NY
US51110154	1	EA	NY
MY46130369	1	EA	NY
MY46472181	1	EA	NY
	1	EA	NY
MY46180389	1	EA	NY
US40500891	1	EA	GCE
GB37170943	1	EA	NY
MY50360008	1	EA	GCE
78380416	1	EA	GCE
MY48200635	1	EA	GCE
10246, 10241	2	EA	NY
	1	EA	NY
#1	1	EA	NY
#2	1	EA	NY
#3	1	EA	NY
#4	1	EA	NY
#5	1	EA	NY
#6	1	EA	NY
#7	1	EA	NY
#8	1	EA	NY
#9	1	EA	NY
#10	1	EA	NY
#11	1	EA	NY
#12	1	EA	NY
#13	1	EA	NY
#14	1	EA	NY
#15	1	EA	NY
	2	EA	GCE
3C3KTG2	1	EA	GCE
	5	SET	NY



NATO Communications and Information Agency

**DSO TSGT3G DCIS, DAC
Annual Preventive Maintenance Inspection
ADVANCE PMI
EBA Work Order NO:**

NCIA CSSC ENM TRS/SAS	
Revision	2.3
Date	01 Feb 2021



TSGT 3G-DSO DCIS, DACC 3rd Level Annual Preventive Maintenance Inspection Procedure & Checklist <i>ADVANCE PMI</i>			
Section Owner:	Transmission Systems SATCOM	Document Writer	NIC B-4 Ruhi Cetin
Version:	VER. 2.2	Document Controller and editor	NIC B-4 Ruhi Cetin NIC B-5 Andreas Kunisch
Creation Date:	02 Jul 2020	Document Approval	NIC A-2 John Parris
Description:	<p>This Procedure & checklist gives detail of the set up how a Satellite Communication Technician should perform 3rd level Annual Preventive Maintenance on DAC, DCIS DSO TSGT G3 Satellite Systems.</p> <p>A System Risk Analysis (or Last Minute Risk Assessment) has to be completed, to ensure that risks kept to a minimum.</p>		
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1.0 SYSTEM Annual PMI Summary

Work Package TRS	
Number:	1
Title:	Perform Preventive Maintenance Inspection (PMI) on DSO TSGT (OL??)
Location:	TSS-CSSC BRUNSSUM
Priority:	1
PMI Performed on	
Technician#1	<input type="text"/> Signature: <input type="text"/>
Technician#2	<input type="text"/> Signature: <input type="text"/>
Status	Fully Operational
Limitations/Tasks	Listed Below

Task	Status Open/Completed	(INC)Incident Number	Task Description	Remarks
1			Performed Annual preventive maintenance inspection in accordance with set procedures.	
2			Corrective Action for broken items.	
3			Upgrade EBEM Modem Battery	

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4			Electrical Safety checks	
5			TE Calibration	
6			Fiber rolls checks	

1.1 SYSTEM INITIAL ASSESMENT/STATUS CHECKS

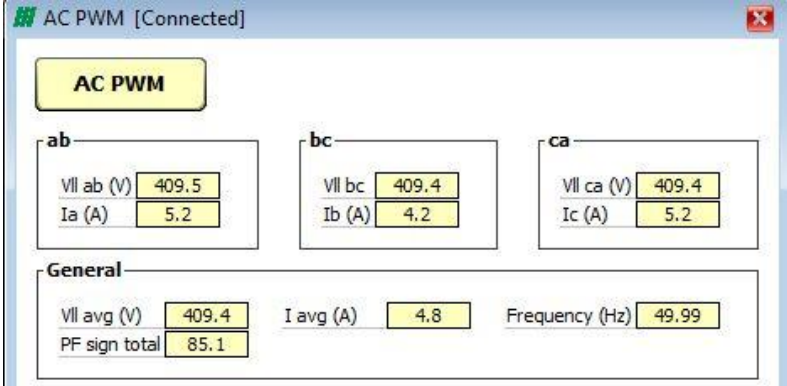
1.2 UPS FUNCTIONAL CHECKS

PROCEDURE / REPORT OF TEST N° 1.1 & 1.2				
TEST NAME: Initial Status		ELEMENT UNDER TEST: COMPLETE SYSTEM		PROJECT: TSGT-DSO
NUMBER	TEST SEQUENCE	EXPECTED RESULT	RESULT	REMARKS
	Pre-System Checks			
1.	Confirm system installation performed in accordance with installation procedure.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
2.	Check system grounding connectivity.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
3.	Check Lightning rods and lightning connectivity.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
4.	Check for tears, corrosion, or any defect, rust on the T2 shelter and on the structure.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
5.	Check for inside, roadside, cabin entry and all ETB's Dampers/Strut on the structure.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

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PROCEDURE / REPORT OF TEST Nº 1.1 & 1.2				
TEST NAME: Initial Status	ELEMENT UNDER TEST: COMPLETE SYSTEM			PROJECT: TSGT-DSO
6.	Visual Check curbside, roadside, cabin entry EMI shielding/filtering.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
7.	Visual Check T2 Antenna clamps and waveguide system for any defect.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
Pre-Power on Checks				
1.	Check Mains Power ETB Power connectors and confirm them that they are not corroded and not lose or broken.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
2.	Confirm the Emergency Power Disconnect Switch (S1) located on the P-ETB is not engaged.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
3.	Confirm the Emergency Power Disconnect Switch (S6) located above the rear Road side wheel well of the TSGT Container is not engaged.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
4.	Confirm all circuit breakers located in the Clean and Dirty Power Distribution Panels are in the OFF position.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
5.	Confirm all Inverter Module Input and Output circuit breakers and Inverter Chassis circuit breakers are in the OFF position.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
System Initial Power On Checks				

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PROCEDURE / REPORT OF TEST Nº 1.1 & 1.2				
TEST NAME: Initial Status	ELEMENT UNDER TEST: COMPLETE SYSTEM	PROJECT: TSGT-DSO		
1.	<p>Connect MAIN POWER from the PGS or Commercial Power Socket to the Main Power Input on the Power ETB. Power up the system from main circuit breaker at the AC Power Meter located in the Dirty Power Distribution Panel, verify that the voltage is within the range 360 – 440VAC (400VAC ± 10%). Open check and Print AC PWM screen on ASNMC GUI.</p> <p>3Phase Voltage : V_{AVG} 3Phase Current : I_{AVG} 3Phase Power : KW 3Phase Frequency: Freq.</p>	 <p>The screenshot shows the 'AC PWM [Connected]' window. It displays three phase-specific boxes: 'ab' with Vll ab (V) at 409.5 and Ia (A) at 5.2; 'bc' with Vll bc at 409.4 and Ib (A) at 4.2; and 'ca' with Vll ca (V) at 409.4 and Ic (A) at 5.2. A 'General' section at the bottom shows Vll avg (V) at 409.4, I avg (A) at 4.8, Frequency (Hz) at 49.99, and PF sign total at 85.1.</p>		
2.	Engage Emergency Stop button (Emergency Power Disconnect Switch (S1) located on the P-ETB) if it is cutting all power to system and tripping mains Circuit Breakers.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
3.	Disengage Emergency Stop button (Emergency Power Disconnect Switch (S1) located on the P-ETB) restore CCT Breakers and apply power to system.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
4.	Power up ECU's A&B (check if the temperature is below +4 degrees) and check all ECU's heating.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
5.	<p>Powers up All ECU's in turn and check, if all of them are configured and functioning properly.</p> <p>ECU : A Temperature : +23 degrees Mode : AUTO</p>	Temperature : +23 degrees Mode : AUTO	A:	
6.	<p>ECU : B Temperature : +23 degrees Mode : AUTO</p>	Temperature : +23 degrees	B:	

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PROCEDURE / REPORT OF TEST Nº 1.1 & 1.2				
TEST NAME: Initial Status		ELEMENT UNDER TEST: COMPLETE SYSTEM		PROJECT: TSGT-DSO
			Mode : AUTO	
7.	ECU _____ : C Temperature : +23 degrees Mode : AUTO		Temperature : +23 degrees Mode : AUTO	C:
8.	Open Battery Compartment and Check Batteries status.			<input type="checkbox"/> Passed <input type="checkbox"/> Failed
9.	Start the power-on procedure till the point that rectifiers have to be switched on and apply test procedure, Final combined (7 EA) rectifiers Output. Maximum 2 Rectifier failure is acceptable for the UPS. Minimum 5 Rectifier can support the System. Open/check and Print UPS Rectifiers screen on ASNMC GUI.		54.4 VDCVDC

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PROCEDURE / REPORT OF TEST Nº 1.1 & 1.2

TEST NAME: Initial Status

ELEMENT UNDER TEST: COMPLETE SYSTEM

PROJECT: TSGT-DSO

Rectifier [Connected]

Rectifier

Power Rectifiers Alarms

moduleComStatus_1	Normal	moduleComStatus_2	Normal	moduleComStatus_3	Normal	moduleComStatus_4	Normal
moduleOk_1	Normal	moduleOk_2	Normal	moduleOk_3	Normal	moduleOk_4	Normal
moduleEnabled_1	Disabled	moduleEnabled_2	Disabled	moduleEnabled_3	Disabled	moduleEnabled_4	Disabled
inputVoltage_1	240	inputVoltage_2	240	inputVoltage_3	240	inputVoltage_4	240
outputVoltage_1	54.5	outputVoltage_2	54.4	outputVoltage_3	54.5	outputVoltage_4	54.5
outputCurrent_1	5.2	outputCurrent_2	5.4	outputCurrent_3	5.1	outputCurrent_4	5.3
meanCurrent_1	54	meanCurrent_2	53	meanCurrent_3	53	meanCurrent_4	53
temperature_1	19	temperature_2	22	temperature_3	25	temperature_4	17
moduleComStatus_5	Normal	moduleComStatus_6	Normal	moduleComStatus_7	Normal		
moduleOk_5	Normal	moduleOk_6	Normal	moduleOk_7	Normal		
moduleEnabled_5	Disabled	moduleEnabled_6	Disabled	moduleEnabled_7	Disabled		
inputVoltage_5	239	inputVoltage_6	240	inputVoltage_7	240		
outputVoltage_5	54.5	outputVoltage_6	54.6	outputVoltage_7	54.5		
outputCurrent_5	5.5	outputCurrent_6	5.6	outputCurrent_7	5.1		
meanCurrent_5	55	meanCurrent_6	54	meanCurrent_7	53		
temperature_5	21	temperature_6	24	temperature_7	26		

10.

Turn on Inverters 1-4 and record operational status.

Inverter #1:
Inverter #2:
Inverter #3:
Inverter #4:

Passed Failed
 Passed Failed
 Passed Failed
 Passed Failed

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PROCEDURE / REPORT OF TEST N° 1.1 & 1.2				
<p>TEST NAME: Initial Status</p>	<p>ELEMENT UNDER TEST: COMPLETE SYSTEM</p>		<p>PROJECT: TSGT-DSO</p>	
<p>11.</p>	<p>Log in to UPS Rectifier Controller with PowCom Application and Check UPS controller Charger Operational Status and record Charger voltage and current. Print screen "Status screen" on GUI...</p>			
<p>12.</p>	<p>Check if Unipower Charger controller Battery Overvoltage set properly.</p>	<p>57.0 Volts DC</p>	<p><input type="checkbox"/> Passed <input type="checkbox"/> Failed</p>	

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PROCEDURE / REPORT OF TEST N° 1.1 & 1.2				
TEST NAME: Initial Status	ELEMENT UNDER TEST: COMPLETE SYSTEM			PROJECT: TSGT-DSO
13	Check if Unipower Charger controller Battery Under voltage set properly.	46.0 Volts DC	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
14.	Make sure Unipower charger Battery Current Limit is enabled and current limited to 40 Amp.	Battery current limit 40A	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
15.	Check if Unipower Charger controller disables (LVDS) Remove Battery Connectivity/ Kill UPS before batteries completely drained.	43.5 Volts DC	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
16.	Check if Unipower Charger controller disables (EPO Switch) Shutdown Complete System.	43.0 Volts DC	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
17.	Maximum only 1 Inverter failure is acceptable for the UPS. Minimum 3 Inverter can supply power to the System.			

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PROCEDURE / REPORT OF TEST N° 1.1 & 1.2				
TEST NAME: Initial Status	ELEMENT UNDER TEST: COMPLETE SYSTEM			PROJECT: TSGT-DSO
18.	Turn on Clean power distribution panel circuit breakers and apply power to the equipment racks circuit breakers. Verify that power has been applied to all racks, all fits and not tripping. Power ON all independent units by switching them ON and check all having initial power ON status.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
19.	Switch off CB1 on the Dirty Power Panel and check that the system is capable on UPS power for at least 5 minutes.	5 Min. > 44.0 V	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
20.	MACS DELL Maintenance LAPTOP with ORION Software	Windows 7 Professional Operating system starts. AxxSys Orion Graphical User Interface starts up.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
21.	ACU (ANTENNA CONTROL UNIT) FOR T1	Boot sequence for T1	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
22.	ACU (ANTENNA CONTROL UNIT) FOR T2	Boot sequence for T2	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
23.	POWER DRIVE UNIT (PDU) T2	Driving Antenna	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
24.	PMU OPERATION-T2	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
25.	T2 ANTENNA SUBSYSTEM	Moving Antenna on Both Sector AZ/EL	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
26.	EMS SERVER COMPUTER LMCa	EMS GUI operation Log GUI Revision. REV.2.1.12	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
27.	EMSe 1 MODEM	Booting Modems without any alarm	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

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PROCEDURE / REPORT OF TEST Nº 1.1 & 1.2				
TEST NAME: Initial Status	ELEMENT UNDER TEST: COMPLETE SYSTEM			PROJECT: TSGT-DSO
28.	EMSe 2 MODEM	Booting Modems without any alarm	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
29.	EMSe 3 MODEM	Booting Modems without any alarm	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
30.	EMSe 4 MODEM	Booting Modems without any alarm	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
31.	ASNMC LCAm SERVER COMPUTER	Windows Win7 prof. operating system starts ASNMC GUI Interface starts. ASNMC VER.1.2.2 Beta iDirect GUI access	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
32.	ASNMC DWS CLIENT COMPUTER	Windows Win7 prof. operating system starts ASNMC GUI Interface starts. ASNMC VER.1.2.2 Beta iDirect GUI access	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
33.	ASNMC VPN ROUTER&SWITCH	Initial power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
34.	ASNMC NU PHONE	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
35.	ASNMC NR PHONE	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
36.	ASNMC SWITCH	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
37.	VIASAT EBEM MODEM#1	Initial power up Check FW version Rev. 02.03.02	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

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PROCEDURE / REPORT OF TEST Nº 1.1 & 1.2				
TEST NAME: Initial Status	ELEMENT UNDER TEST: COMPLETE SYSTEM			PROJECT: TSGT-DSO
38.	VIASAT EBEM MODEM#2	Initial Power up Check FW version Rev. 02.03.02	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
39.	VIASAT EBEM MODEM#3	Initial Power up Check FW version Rev. 02.03.02	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
40.	VIASAT EBEM MODEM#4	Initial Power up Check FW version Rev. 02.03.02	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
41.	VIASAT EBEM MODEM#5	Initial Power up Check FW version Rev. 02.03.02	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
42.	LINE APMLIFIERS	Initial power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
43.	NETCLOCK TFRS #1	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
44.	NETCLOCK TFRS #2	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
45.	SPECTRA TFRS DISTRIBUTION AMPLIFIER1	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
46.	SPECTRA TFRS DISTRIBUTION AMPLIFIER2	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
47.	GPS ANTENNA	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
48.	(On DAC 1-4) DXC #1 & FO-MICE EQUIPMENT	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
49.	(On DAC 1-4) DXC #2 & FO-MICE EQUIPMENT	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

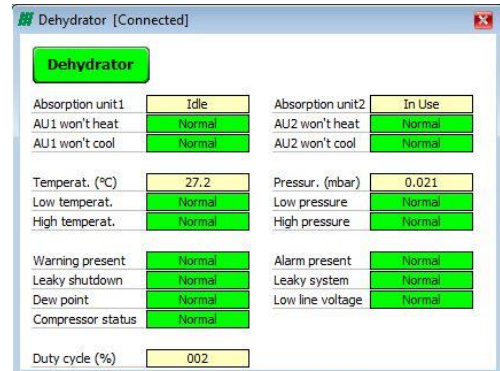
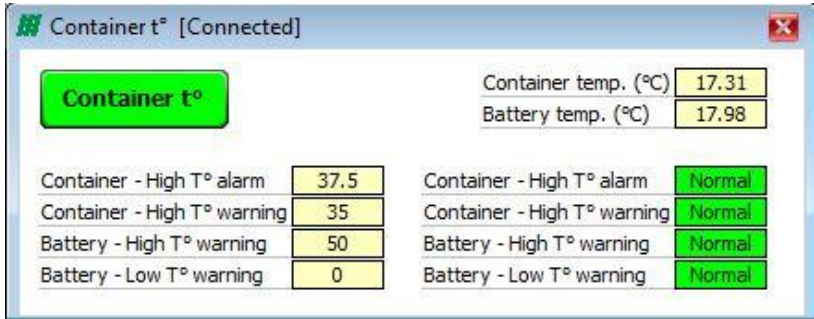
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PROCEDURE / REPORT OF TEST Nº 1.1 & 1.2				
TEST NAME: Initial Status	ELEMENT UNDER TEST: COMPLETE SYSTEM			PROJECT: TSGT-DSO
50.	(On DCIS & DCAOC) FDMA ROUTER #1	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
51.	(On DCIS & DCAOC) FDMA Switch #1	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
52.	(On DCIS & DCAOC) EMS ROUTER #2	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
53.	(On DCIS & DCAOC) EMS Switch #2	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
54.	Check Fiber Patch Panel and fiber connectors	Wiring status.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
55.	ORION SYSTEM MANAGEMNET SUB SYSTEM AMP#1 16 PORT	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
56.	ORION SYSTEM MANAGEMNET SUB SYSTEM DELL SWITCH	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
57.	BUC A (BLOCK UP CONVERTER) for T1	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
58.	BUC SWITCHING UNIT for T1	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
59.	BUC B (BLOCK UP CONVERTER) for T1	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
60.	BUC A (BLOCK UP CONVERTER) for T2	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	


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PROCEDURE / REPORT OF TEST N° 1.1 & 1.2				
TEST NAME: Initial Status	ELEMENT UNDER TEST: COMPLETE SYSTEM			PROJECT: TSGT-DSO
61.	BUC SWITCHING UNIT for T2	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
62.	BUC B (BLOCK UP CONVERTER) for T2	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
63.	BDC A (BOCK DOWN CONVERTER) for T1	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
64.	BDC SWITCHING UNIT for T1	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
65.	BDC B (BOCK DOWN CONVERTER) for T1	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
66.	BDC A (BOCK DOWN CONVERTER) for T2	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
67.	BDC SWITCHING UNIT for T2	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
68.	BDC B (BOCK DOWN CONVERTER) for T2	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
69.	UPLINK EQUALIZER T1	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
70.	UPLINK EQUALIZER T2	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
71.	SSPA SUB SYSTEM #	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
72.	SSPA #A	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
73.	SSPA #B	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

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PROCEDURE / REPORT OF TEST N° 1.1 & 1.2				
TEST NAME: Initial Status	ELEMENT UNDER TEST: COMPLETE SYSTEM		PROJECT: TSGT-DSO	
74.	LNA SUB SYSTEM	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
75.	LNA #A	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
76.	LNA #B	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
77.	ANTI_ICING SYSTEM	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
78.	DEHYDRATOR Check duty cycle and operation of Dehydrator on ASNMC and attach print screen of page.	Initial Power up		
79.	CONTAINER TEMP Check Container temperature operation on ASNMC and attach print screen of page.			

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PROCEDURE / REPORT OF TEST Nº 1.1 & 1.2				
TEST NAME: Initial Status	ELEMENT UNDER TEST: COMPLETE SYSTEM	PROJECT: TSGT-DSO		
80.	WEATHER REPORTING SYSTEM Check Weather St. operation on ASNMC and attach print screen of page.			
81.	MISC. ALARMS T-2	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
82.	PGS (POWER GENERATION SYSTEM) SUB SYSTEM	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
83.	PDU T1 ANTENNA -OPERATION	Initial Power up AZ/EL drive	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
84.	PMU OPERATION-T1	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
85.	HPA SUB SYSTEM-T1	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
86.	HPA #A	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
87.	HPA#B	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
88.	LNA SUB SYSTEM _T1	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

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PROCEDURE / REPORT OF TEST N° 1.1 & 1.2				
TEST NAME: Initial Status	ELEMENT UNDER TEST: COMPLETE SYSTEM			PROJECT: TSGT-DSO
89.	LNA#A	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
90.	LNA#B	Initial Power up	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

1.2.1 TEST EQUIPMENT FUNCTIONAL CHECKS

PROCEDURE / REPORT OF TEST N° 1.2.1				
TEST NAME: Test Equipment FUNCTIONAL CHECKS	ELEMENT UNDER TEST: TEST EQUIPMENT			PROJECT: TSGT-DSO
STEP	TEST SEQUENCE	EXPECTED RESULT	RESULT	REMARKS
1.	TELINC WAN TESTER, TL2084EB S/N:6439323	Check power on status and CAL DUE DATE:		
2.	Keysight N1913A POWER METER, SN: MY52490034	Check power on status and CAL DUE DATE:		
3.	Agilent 8481D POWER SENSOR, S/N:MY41094832	Check power on status and CAL DUE DATE:		
4.	Fluke 28 II S/N:	Check power on status and CAL DUE DATE:		
5.	NARDA99899 S/N:E-2316	Check power on status and CAL DUE DATE:		
6.	MCL Attenuator 3 db. S/N:0316	Check power on status and CAL DUE DATE:		

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PROCEDURE / REPORT OF TEST Nº 1.2.1				
TEST NAME: Test Equipment FUNCTIONAL CHECKS	ELEMENT UNDER TEST: TEST EQUIPMENT	PROJECT: TSGT-DSO		
	MCL Attenuator 6 db. S/N:0616	Check power on status and CAL DUE DATE:		
	MCL Attenuator 10 db. S/N:1016	Check power on status and CAL DUE DATE:		
	MCL Attenuator 20 db. S/N:2016	Check power on status and CAL DUE DATE:		
	Model 11708A 30db. S/N:63869	Check power on status and CAL DUE DATE:		
7.	BK PRECISION Spectrum Analyzer 2658A S/N: 2101031524	Check power on status and CAL DUE DATE:		
8.	JDSU DATA TESTER S/N:	Check power on status and CAL DUE DATE:		
9.	F/O 250meter HMA 4CH.SM S/N:9319/W054	Check power on status and CAL DUE DATE:		
10.	F/O 250meter HMA 4CH.SM S/N:9319/W057	Check power on status and CAL DUE DATE:		

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1.2.1.1 HPA 750 W PMI ADVANCE

PROCEDURE / REPORT OF TEST N°:1.2.1.1				
TEST NAME: HPA 750W PMI Advanced		ELEMENT UNDER TEST: Transmission TX Sub System		PROJECT: TSGT-DSO
STEP	TEST SEQUENCE	EXPECTED RESULT	RESULT	REMARKS
1.	Uninstall HPA # A from its location and apply operational bench check.	Initial performance test.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
2.	Remove and Clean Fan unit B1	OK	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
3.	Check operation and the Replace B1 Fan unit. Replace fan after 50.000 Hours of operation or every 4 years	OK	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
4.	Check operation and the Replace B2 internal Fan. Replace fan after 50.000 Hours of operation or every 4 years	OK	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
5.	Place a fan replacement sticker inside the fan unit.	OK	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
6.	Remove A1 Assembly, 'Power Factor Module'. Clean and replace heatsink compound.	Clean and replace heatsink compound.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
7.	Remove A2 Module, Assembly, Power Processor, CCA, Clean and replace heatsink compound.	Clean and replace heatsink compound.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
8.	Remove A4 Module, Assembly, High Voltage Module. Replace Capacitors C1&C2when unit is noisy.	Clean and replace heatsink compound.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
9.	Remove A4 Module, Assembly, High Voltage Module. Clean and replace heatsink compound.	Clean and replace heatsink compound.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
10.	Remove A6 Module ASSEMBLY, CIRCUIT CARD, FAN POWER, CCA. Clean and replace heatsink compound.	Clean and replace heatsink compound.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
11.	Remove V2 ASSEMBLY, TWT, 750W,X-BAND. Clean and replace heatsink compound.	Clean and replace heatsink compound.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
12.	Replace Backup Battery and set up data properly on uP/LOGIC Controller.	OK	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
13.	Check Main and Boot Versions	Boot version:		

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PROCEDURE / REPORT OF TEST N°:1.2.1.1				
TEST NAME: HPA 750W PMI Advanced	ELEMENT UNDER TEST: Transmission TX Sub System	PROJECT: TSGT-DSO		
		Main Version		
14.	Calibrate output Voltage of the Power factor Module @ fully loaded	375 VDC		
15.	Calibrate TWT Heater Voltage	6.3V		
16.	Calibrate Helix Voltage against TWT operational specs.	As specified on TWT label		
17.	Log Collector 1 Voltage	As specified on TWT label		
18.	Log Collector 2 Voltage	As specified on TWT label		
19.	Log Helix Current @500 Watt RF transmission	As Required		
20.	Calibrate RF Forward Power	As Required		
21.	Calibrate RF reverse Power	As Required		
22.	Log print screen of the HPA configuration pages			
23.	Apply other calibration procedures for uP/LOGIC Controller	As Required	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
24.	Apply Single Frequency Power & gain tests.	Provide test results	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

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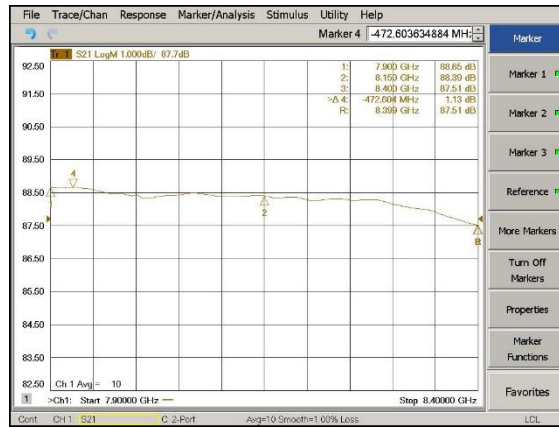
PROCEDURE / REPORT OF TEST N°:1.2.1.1				
TEST NAME: HPA 750W PMI Advanced	ELEMENT UNDER TEST: Transmission TX Sub System			PROJECT: TSGT-DSO
25.	Apply 500 MHz Sweep and gain test	Provide test results	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

PROCEDURE / REPORT OF TEST N^o:1.2.1.1

TEST NAME: HPA 750W PMI
Advanced

ELEMENT UNDER TEST: Transmission TX Sub System

PROJECT: TSGT-DSO



@J4



@ Output

26.

Perform 24 hours On Line test burn @ 500 Watt RF Output and log

Fan Voltage

Cabinet temperature

TWT Temperature

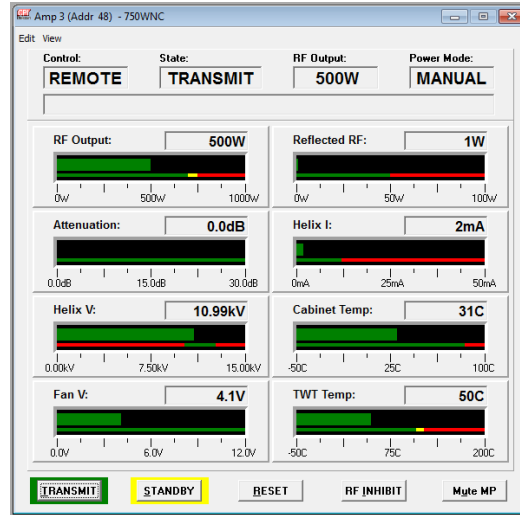
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PROCEDURE / REPORT OF TEST N°:1.2.1.1

TEST NAME: HPA 750W PMI
Advanced

ELEMENT UNDER TEST: Transmission TX Sub System

PROJECT: TSGT-DSO



27.	Uninstall HPA # B from its location and apply operational bench check.	Initial performance test.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
28.	Remove and Clean Fan unit B1	OK	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
29.	Check operation and the Replace B1 Fan unit. Replace fan after 50.000 Hours of operation or every 4 years	OK	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
30.	Check operation and the Replace B2 internal Fan. Replace fan after 50.000 Hours of operation or every 4 years	OK	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
31.	Place a fan replacement date sticker inside the fan unit.	OK	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
32.	Remove A1 Assembly, 'Power Factor Module'. Clean and replace heatsink compound.	Clean and replace heatsink compound.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
33.	Remove A2 Module, Assembly, Power Processor, CCA, Clean and replace heatsink compound.	Clean and replace heatsink compound.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

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PROCEDURE / REPORT OF TEST N°:1.2.1.1				
TEST NAME: HPA 750W PMI Advanced	ELEMENT UNDER TEST: Transmission TX Sub System	PROJECT: TSGT-DSO		
34.	Remove A4 Module, Assembly, High Voltage Module. Replace Capacitors C1&C2 when unit is noisy.	Clean and replace heatsink compound.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
35.	Remove A4 Module, Assembly, High Voltage Module. Clean and replace heatsink compound.	Clean and replace heatsink compound.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
36.	Remove A6 Module ASSEMBLY, CIRCUIT CARD, FAN POWER, CCA. Clean and replace heatsink compound.	Clean and replace heatsink compound.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
37.	Remove V2 ASSEMBLY, TWT, 750W,X-BAND. Clean and replace heatsink compound.	Clean and replace heatsink compound.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
38.	Replace Backup Battery and set up data properly on uP/LOGIC Controller.	OK	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
39.	<i>Check Main and Boot Versions</i>	Boot version:		
		Main Version		
40.	Calibrate output Voltage of the Power factor Module @ fully loaded	375 VDC		
41.	Calibrate TWT Heater Voltage	6.3V		
42.	Calibrate Helix Voltage against TWT operational specs.	As specified on TWT label		
43.	Log Collector 1 Voltage	As specified on TWT label		
44.	Log Collector 2 Voltage	As specified on TWT label		
45.	Log Helix Current @500 Watt RF transmission	As Required		
46.	Calibrate RF Forward Power	As Required		
47.	Calibrate RF reverse Power	As Required		
48.	Log print screen of the HPA configuration pages			

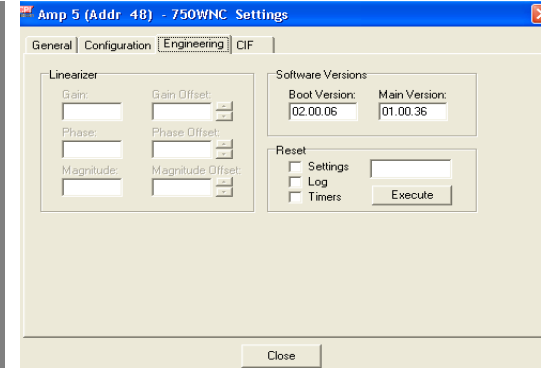
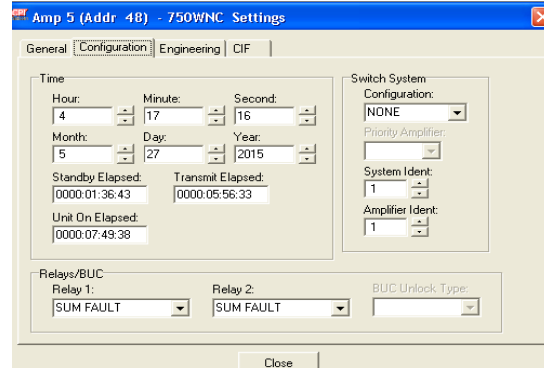
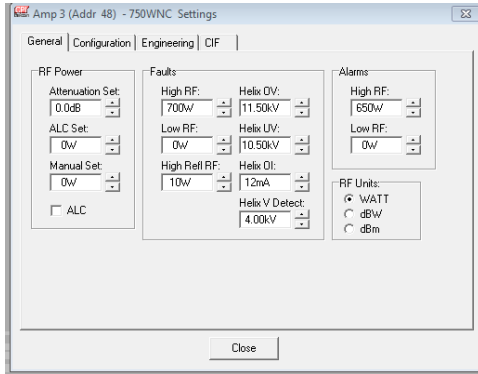
NATO UNCLASSIFIED

PROCEDURE / REPORT OF TEST N^o:1.2.1.1

**TEST NAME: HPA 750W PMI
Advanced**

ELEMENT UNDER TEST: Transmission TX Sub System

PROJECT: TSGT-DSO



49.	Apply other calibration procedures for uP/LOGIC Controller	As Required	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
50.	Apply Single Frequency Power & gain tests.	Provide test results	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

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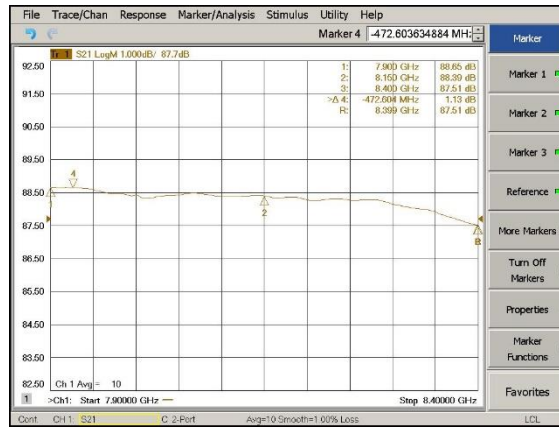
PROCEDURE / REPORT OF TEST N°:1.2.1.1				
TEST NAME: HPA 750W PMI Advanced	ELEMENT UNDER TEST: Transmission TX Sub System			PROJECT: TSGT-DSO
51.	Apply 500 MHz Sweep and gain test	Provide test results	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

PROCEDURE / REPORT OF TEST N°:1.2.1.1

TEST NAME: HPA 750W PMI
Advanced

ELEMENT UNDER TEST: Transmission TX Sub System

PROJECT: TSGT-DSO



@J4



@ Output

52.

Perform 24 hours On Line test burn @ 500 Watt RF Output and log

Fan Voltage

Cabinet temperature

TWT Temperature

PROCEDURE / REPORT OF TEST N ^o :1.2.1.1		
TEST NAME: HPA 750W PMI Advanced	ELEMENT UNDER TEST: Transmission TX Sub System	PROJECT: TSGT-DSO

1.2.2 TX RF OUTPUT FREQUENCY ACCURACY

PROCEDURE / REPORT OF TEST N ^o 1.2.2				
TEST NAME: RF Output Frequency accuracy	ELEMENT UNDER TEST: Transmission Subsystem		PROJECT: TSGT-DSO	
STEP	TEST SEQUENCE	EXPECTED RESULT	RESULT	REMARKS
1.	-Connect Frequency Counter to the Net Cock (A) , RF out BNC port, and measure the 10 MHz Output Frequency .	10.000.000Hz ±3 HzHz	

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PROCEDURE / REPORT OF TEST Nº 1.2.2				
TEST NAME: RF Output Frequency accuracy	ELEMENT UNDER TEST: Transmission Subsystem		PROJECT: TSGT-DSO	
2.	Connect Power Meter or Spectrum Analyzer to the Net Cock (A) , RF out BNC port, and measure the 10 MHz Output Level .	NET CLOCK:9383 +10dBm(±1dBm)		
		NET CLOCK:9400 +13dbm (±1dBm)dbm	
3.	- Connect Power Meter or Spectrum Analyzer to the Spectracom Distribution Amplifier (A) , RF out BNC port, and measure the 10 MHz Output Level.	DIST.AMP OUTPUT NETCLOCK is 9383) (+0dbm ±1dbm)		
		NETCLOCK is 9400 (+4dbm ±1dbm)dbm	
4.	-Connect Frequency Counter to the Net Cock (B) , RF out BNC port, and measure the 10 MHz Output Frequency.	10.000.000Hz ±3 HzHz	

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PROCEDURE / REPORT OF TEST N° 1.2.2				
TEST NAME: RF Output Frequency accuracy	ELEMENT UNDER TEST: Transmission Subsystem			PROJECT: TSGT-DSO
5.	Connect Power Meter or Spectrum Analyzer to the Net Cock (B), RF out BNC port, and measure the 10 MHz Output Level.	NET CLOCK:9383 +10dBm(±1dBm)		
		NET CLOCK:9400 +13dbm (±1dBm)dbm	
6.	Connect Power Meter or Spectrum Analyzer to the Spectracom Distribution Amplifier (B), RF out BNC port, and measure the 10 MHz Output Level.	DIST.AMP OUTPUT NETCLOCK is 9383 (+0dbm ±1dbm)		
		NETCLOCK is 9400 (+4dbm ±1dbm)	+4.80dbm	
7.	Configure Test setup as indicated in test procedure CSSC/SATCOM TX_RF_OUTPUT_ACCURACY Test Procedure" For T1, Connect the Frequency Counter to the port J26 of the UPLINK P/P. Make sure that the TX subsystem output is connected to Dummy LOAD. Signal Gen: CW, 950Mhz, 1200Mhz, 1450Mhz injected -10dbm on UPLINK P/P, L Band, U link, where the EBEM1 connected.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

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PROCEDURE / REPORT OF TEST Nº 1.2.2				
TEST NAME: RF Output Frequency accuracy	ELEMENT UNDER TEST: Transmission Subsystem			PROJECT: TSGT-DSO
8.	<p><u>Select T1, BUC A, ONLINE.</u></p> <p>Read and Fill in the table, test results for T1 BUC A</p>	<p>$7.90 \times 10^9 \pm 285.25 \text{ Hz}$</p> <p>$8.15 \times 10^9 \pm 285.25 \text{ Hz}$</p> <p>$8.40 \times 10^9 \pm 285.25 \text{ Hz}$</p>		
9.	<p><u>Select T1, BUC B, ONLINE.</u></p> <p>Read and Fill in the table, test results for T1 BUC B</p>	<p>$7.90 \times 10^9 \pm 285.25 \text{ Hz}$</p> <p>$8.15 \times 10^9 \pm 285.25 \text{ Hz}$</p> <p>$8.40 \times 10^9 \pm 285.25 \text{ Hz}$</p>		
10.	<p>For T2, Connect the Frequency Counter to the port J22 of the UPLINK P/P. Make sure that the TX subsystem output is connect to Dummy LOAD.</p> <p>Signal Gen: CW, 950Mhz, 1200Mhz, 1450Mhz injected -10dbm on UPLINK P/P, L Band, U link, where the EBEM1 connected.</p> <p><u>Select T2, BUC A, ONLINE.</u></p> <p>Read and Fill in the table, test results for T2 BUC A</p>	<p>$7.90 \times 10^9 \pm 285.25 \text{ Hz}$</p> <p>$8.15 \times 10^9 \pm 285.25 \text{ Hz}$</p> <p>$8.40 \times 10^9 \pm 285.25 \text{ Hz}$</p>		
11.	<p><u>Select T2, BUC B, ONLINE.</u></p> <p>Read and Fill in the table test results for T2 BUC B</p>	<p>$7.90 \times 10^9 \pm 285.25 \text{ Hz}$</p> <p>$8.15 \times 10^9 \pm 285.25 \text{ Hz}$</p> <p>$8.40 \times 10^9 \pm 285.25 \text{ Hz}$</p>		

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PROCEDURE / REPORT OF TEST N° 1.2.2				
TEST NAME: RF Output Frequency accuracy	ELEMENT UNDER TEST: Transmission Subsystem			PROJECT: TSGT-DSO
12.	-Switch on TFRS, reference to system. Measure the signal frequency of the signal converted to X-band. if required, adjust the frequency adjustment trimmer located on top of the BUC A and Fill in the table test results for T1 BUC A (Using Internal Frequency and front LED is YELLOW)	7.90*10 ⁹ ± 1630 Hz 8.15*10 ⁹ ± 1630 Hz 8.40*10 ⁹ ± 1630 Hz		
13.	-Switch off TFRS, reference to system. Measure the signal frequency of the signal converted to X-band. if required, adjust the frequency adjustment trimmer located on top of the BUC B and Fill in the table test results for T1 BUC B(Using Internal Frequency and front LED is YELLOW)	7.90*10 ⁹ ± 1630 Hz 8.15*10 ⁹ ± 1630 Hz 8.40*10 ⁹ ± 1630 Hz		
14.	-Switch off TFRS, reference to system. Measure the signal frequency of the signal converted to X-band. if required, adjust the frequency adjustment trimmer located on top of the BUC A and Fill in the table test results for T2 BUC A (Using Internal Frequency and front LED is YELLOW)	7.90*10 ⁹ ± 1630 Hz 8.15*10 ⁹ ± 1630 Hz 8.40*10 ⁹ ± 1630 Hz		
15.	-Switch off TFRS, reference to system. Measure the signal frequency of the signal converted to X-band. if required, adjust the frequency adjustment trimmer located on top of the BUC B and Fill in the table test results for T2 BUC B (Using Internal Frequency and front LED is YELLOW)	7.90*10 ⁹ ± 1630 Hz 8.15*10 ⁹ ± 1630 Hz 8.40*10 ⁹ ± 1630 Hz		

1.2.3 TX MANUAL REDUNDANCY

PROCEDURE / REPORT OF TEST N° 1.2.3				
TEST NAME: Manual Redundancy	ELEMENT UNDER TEST: Transmission Subsystem		PROJECT: TSGT-DSO	
STEP	TEST SEQUENCE	EXPECTED RESULT	RESULT	REMARKS
1.	Configure Test setup as indicated in test procedure CSSC/SATCOM TX_RF_OUTPUT_ACCURACY Test Procedure"			
2.	For T1, Set RSU so that BUC A is ON LINE, and establish AUTO Switchover Mode. Simulate a failure in UP Converter A by means of POWER OFF. Check that Up Converter B is ON LINE.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
3.	-Power on Up Converter A. Set RSU so that Up-converter B is ON LINE, and establish AUTO Switchover Mode. Simulate a failure in UP Converter B by means of POWER OFF. Check that Up Converter A is ON LINE.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
4.	For T2, Set RSU so that BUC A is ON LINE, and establish AUTO Switchover Mode. Simulate a failure in UP Converter A by means of POWER OFF. Check that Up Converter B is ON LINE.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
5.	-Power on Up Converter A. Set RSU so that Up-converter B is ON LINE, and establish AUTO Switchover Mode. Simulate a failure in UP Converter B by means of POWER OFF. Check that Up Converter A is ON LINE.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

1.2.4 RX L-BAND FREQUENCY OUTPUT ACCURACY

PROCEDURE / REPORT OF TEST N° 1.2.4				
TEST NAME: IF Output accuracy		ELEMENT UNDER TEST: Reception Subsystem		PROJECT: TSGT-DSO
STEP	TEST SEQUENCE	EXPECTED RESULT	RESULT	REMARKS
1.	<p>Configure Test setup as indicated in test procedure CSSC/SATCOM RX_RF_IFOUTPUT_ACCURACY Test Procedure</p> <p>Signal Gen: CW, 7.25Ghz, 7.5Ghz, 7.75Ghz injected -20dbm on RX IN COUPLER, first for T1 and then T2 in turn.</p> <p>Connect Frequency Counter on DOWNLINK P/P, L Band, U link, where the EBEM1 connected. J40 for T2, J76 for T1.</p>		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
2.	<p><u>Select T1, BDC A, ON LINE.</u></p> <p>Measure the frequency of the signal converted to L-band.</p>	<p>$950 \times 10^6 \pm 33.25 \text{ Hz}$</p> <p>$1200 \times 10^6 \pm 42 \text{ Hz}$</p> <p>$1450 \times 10^6 \pm 50.75 \text{ Hz}$</p>		
3.	<p><u>Select T1, BDC B, ON LINE.</u></p> <p>Measure the frequency of the signal converted to L-band.</p>	<p>$950 \times 10^6 \pm 33.25 \text{ Hz}$</p> <p>$1200 \times 10^6 \pm 42 \text{ Hz}$</p> <p>$1450 \times 10^6 \pm 50.75 \text{ Hz}$</p>		
4.	<p><u>Select T2, BDC A, ON LINE.</u></p> <p>Measure the frequency of the signal converted to L-band.</p>	<p>$950 \times 10^6 \pm 33.25 \text{ Hz}$</p> <p>$1200 \times 10^6 \pm 42 \text{ Hz}$</p>		

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PROCEDURE / REPORT OF TEST Nº 1.2.4				
TEST NAME: IF Output accuracy	ELEMENT UNDER TEST: Reception Subsystem		PROJECT: TSGT-DSO	
		1450*10 ⁶ ± 50.75 Hz		
5.	<p>Select T2 BDC B. ON LINE.</p> <p>Measure the frequency of the signal converted to L-band.</p>	<p>950*10⁶ ± 33.25 Hz</p> <p>1200*10⁶ ± 42 Hz</p> <p>1450*10⁶ ± 50.75 Hz</p>		
6.	<p>Switch OFF the TFRS, (Distribution AMP)</p> <p>Select T1 Block Down-Converter A, ON LINE.</p> <p>Measure the frequency of the signal converted to L-band. If necessary, adjust the frequency by adjusting the trimmer on top of the BDC and record test results. (Using Internal Frequency and front LED is YELLOW)</p>	<p>950*10⁶ ± 190 Hz</p> <p>1200*10⁶ ± 240 Hz</p> <p>1450*10⁶ ± 290 Hz</p>		
7.	<p>Select T1 Block Down-Converter B, ON LINE.</p> <p>Measure the frequency of the signal converted to L-band. If necessary, adjust the frequency by adjusting the trimmer on top of the BDC and record test results. (Using Internal Frequency and front LED is YELLOW)</p>	<p>950*10⁶ ± 190 Hz</p> <p>1200*10⁶ ± 240 Hz</p> <p>1450*10⁶ ± 290 Hz</p>		
8.	<p>Switch OFF the TFRS, (Distribution AMP)</p> <p>Select T2 Block Down-Converter A, ON LINE.</p> <p>Measure the frequency of the signal converted to L-band. If necessary, adjust the frequency by adjusting the trimmer on top of the BDC and record test results. (Using Internal Frequency and front LED is YELLOW)</p>	<p>950*10⁶ ± 190 Hz</p> <p>1200*10⁶ ± 240 Hz</p> <p>1450*10⁶ ± 290 Hz</p>		
9.	<p>Select T2 Block Down-Converter B, ON LINE.</p>	<p>950*10⁶ ± 190 Hz</p> <p>1200*10⁶ ± 240 Hz</p>		

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PROCEDURE / REPORT OF TEST N° 1.2.4				
TEST NAME: IF Output accuracy	ELEMENT UNDER TEST: Reception Subsystem			PROJECT: TSGT-DSO
	Measure the frequency of the signal converted to L-band. If necessary, adjust the frequency by adjusting the trimmer on top of the BDC and record test results. (Using Internal Frequency and front LED is YELLOW)	1450*10 ⁶ ± 290 Hz		
10.	Switch ON TFRS, (Distribution AMP) and return to normal configuration		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

1.2.5 RX MANUAL REDUNDANCY

PROCEDURE / REPORT OF TEST N° 1.2.5				
TEST NAME: RX Manual Redundancy	ELEMENT UNDER TEST: Transmission Subsystem			PROJECT: TSGT-DSO
STEP	TEST SEQUENCE	EXPECTED RESULT	RESULT	REMARKS
1.	Configure Test setup as indicated in test procedure CSSC/SATCOM RX_RF_IFOUTPUT_ACCURACY Test Procedure Configure RSU in manual mode and select Down-converter A ON LINE		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
2.	-FOR T1, Set RSU so that Down-Converter A is ON LINE, and establish AUTO Switchover Mode. Simulate a failure in Down Converter A by means of POWER OFF. Check that Down Converter B is ON LINE.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
3.	Power ON, Down Converter A. Set RSU so that Down-converter B is ON LINE, and establish AUTO Switchover Mode.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

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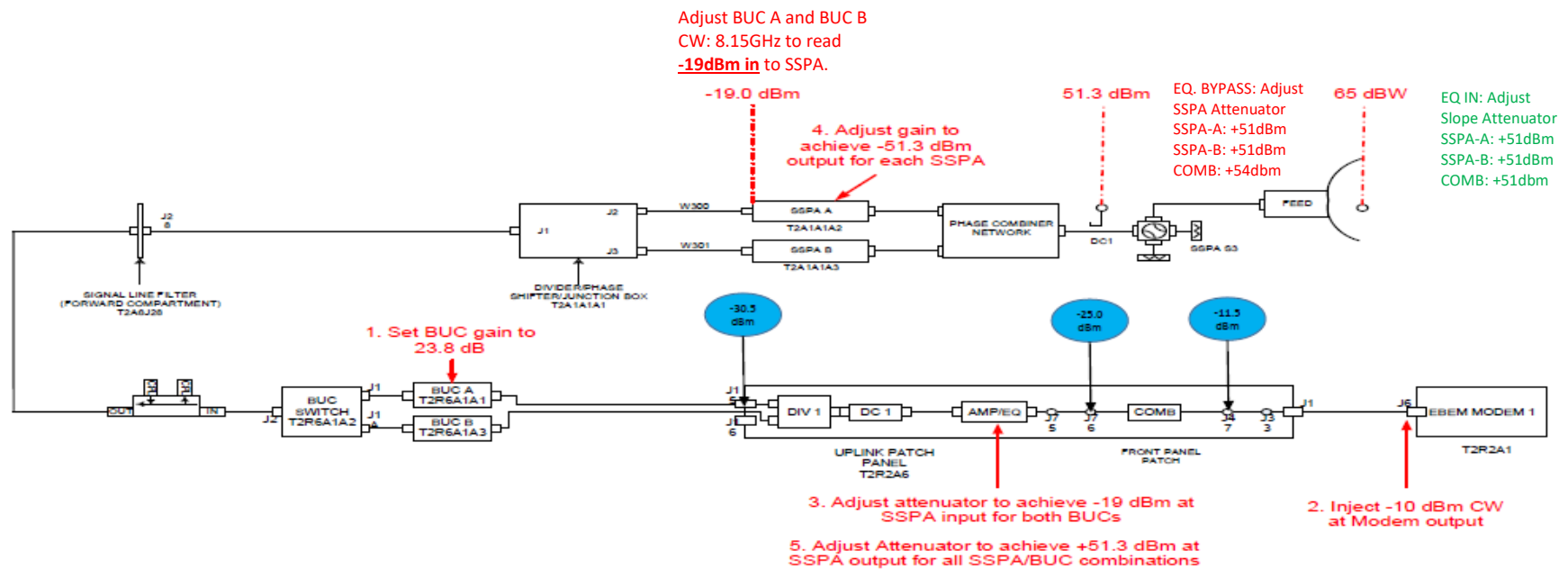
PROCEDURE / REPORT OF TEST Nº 1.2.5				
TEST NAME: RX Manual Redundancy	ELEMENT UNDER TEST: Transmission Subsystem		PROJECT: TSGT-DSO	
	Simulate a failure in Down Converter B by means of POWER OFF. Check that Down Converter A is ON LINE			
4.	-FOR T2, Set RSU so that Down-Converter A is ON LINE, and establish AUTO Switchover Mode. Simulate a failure in Down Converter A by means of POWER OFF. Check that Down Converter B is ON LINE.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
5.	Power ON, Down Converter A. Set RSU so that Down-converter B is ON LINE, and establish AUTO Switchover Mode. Simulate a failure in Down Converter B by means of POWER OFF. Check that Down Converter A is ON LINE		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

1.2.6 POWER BALANCING

1.2.7 T2- TX POWER BALANCING AND PHASE ALIGNMENT

1. Set T-2 Tx Gain to 105 dB

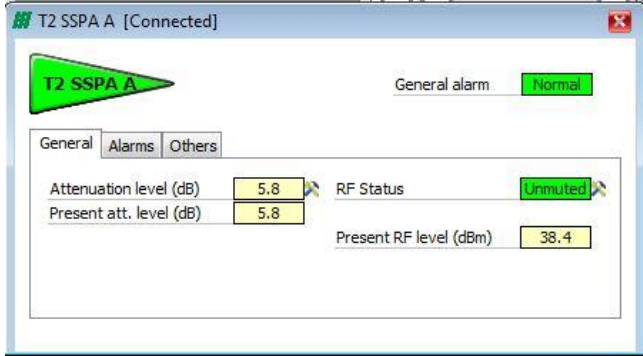
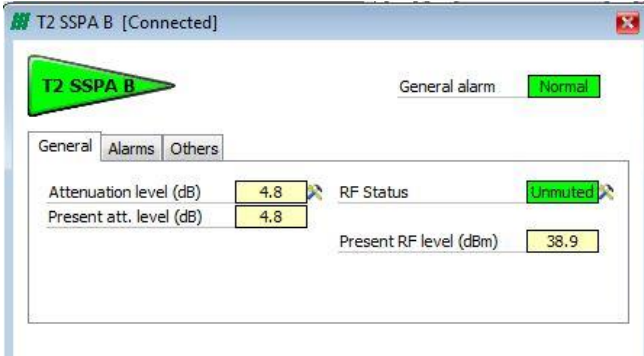
1. Verify gain of each BUC is set to 23.8 dB.
2. Inject a 1200 MHz CW with a level of -10 dBm at the output of EBEM Modem #1.
3. Adjust the Slope Equalizer attenuator to achieve a level of -19.0 dBm at the SSPA input.
4. Adjust the SSPA attenuators to achieve a level of +51.3 dB, at the output of each SSPA.
5. Adjust the Slope Equalizer attenuator to achieve a level of +51.3 dBm at the SSPA output for all SSPA/BUC combinations.



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PROCEDURE / REPORT OF TEST N° 1.2.6 & 1.2.7				
TEST NAME: T2 Power Balancing	ELEMENT UNDER TEST: TX Subsystem	PROJECT: TSGT-DSO		
STEP	TEST SEQUENCE	EXPECTED RESULT	RESULT	REMARKS
1.	Configure Test setup as indicated. TSGT-3G_PowerBalancing_PhaseAlignment_Procedure Point the T-2 antenna to Elevation >60 degrees.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
2.	Perform Power balancing, Phase alignment and Slope adjustment. Antenna moved to out of Satellite region. EL: 60 degree, Or TX Output connected to LOAD. <u>Equalizer Bypassed.</u> -Inject 1.2 GHz, -11.5dBm CW to the L Band P/P. 1. POWER Meter Connected to the INPUT Cable of the SSPA A and then, SSPA B -Adjust BUC A GAIN Potentiometer to read -19dbm on the POWER Meter. -Switchover to BUC B -If not, Adjust the gain of the BUC A&B and label it.	SSPA A INPUT: -19dBm		
3.	Adjust BUC B GAIN Potentiometer to read -19dbm on the POWER meter. -If not, Adjust the gain of the BUC A&B and label it.	SSPA B INPUT: -19dbm		
4.	Set BUC'A' via SSPA'A' and measure the output level of the SSPA (+51dBm) @ Antenna Output Coupler If not, Adjust/Set SSPA A Attenuator to read +51dbm on the Power meter.	+51dBm		
5.	Set BUC'A' via SSPA'B' and measure the output level of the SSPA (+51dBm) @ Antenna Output Coupler If not, Adjust/Set SSPA B Attenuator to read +51dbm on the Power meter.	+51dBm		

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PROCEDURE / REPORT OF TEST N° 1.2.6 & 1.2.7				
TEST NAME: T2 Power Balancing	ELEMENT UNDER TEST: TX Subsystem	PROJECT: TSGT-DSO		
6.	-Set BUC'A' via SSPA'A and B' COMBINED to the LOAD, measure the output level of the Both SSPA (+54dBm) @ Antenna Output Coupler -Adjust Phase Combiner until you see maximum peak for +54dbm on the Power meter.	+54dBm (Power doubled and 3db increased)		
7.	Set BUC'B' via SSPA'A' and measure the output level of the SSPA (+51dBm) @ Antenna Output Coupler	+51dBm		
8.	Set BUC'B' via SSPA'B' and measure the output level of the SSPA (+51dBm) @ Antenna Output Coupler	+51dBm		
9.	-Set BUC'B' via SSPA'A and B' COMBINED to the LOAD, measure the output level of the Both SSPA (+54dBm) @ Antenna Output Coupler.	+54dBm (Power doubled and 3db increased)		
10.	Record Attenuator set up on both SSPA's and DO NOT play/change them. SSPA #A	Attenuator final Value		
11.	Record Attenuator set up on both SSPA's and DO NOT play/change them. SSPA #A	Attenuator final Value		
12.	Capture Pictures print screens on ASNMC GUI: SSPA A&B Attenuation. <div style="display: flex; justify-content: space-around; margin-top: 10px;">   </div>			

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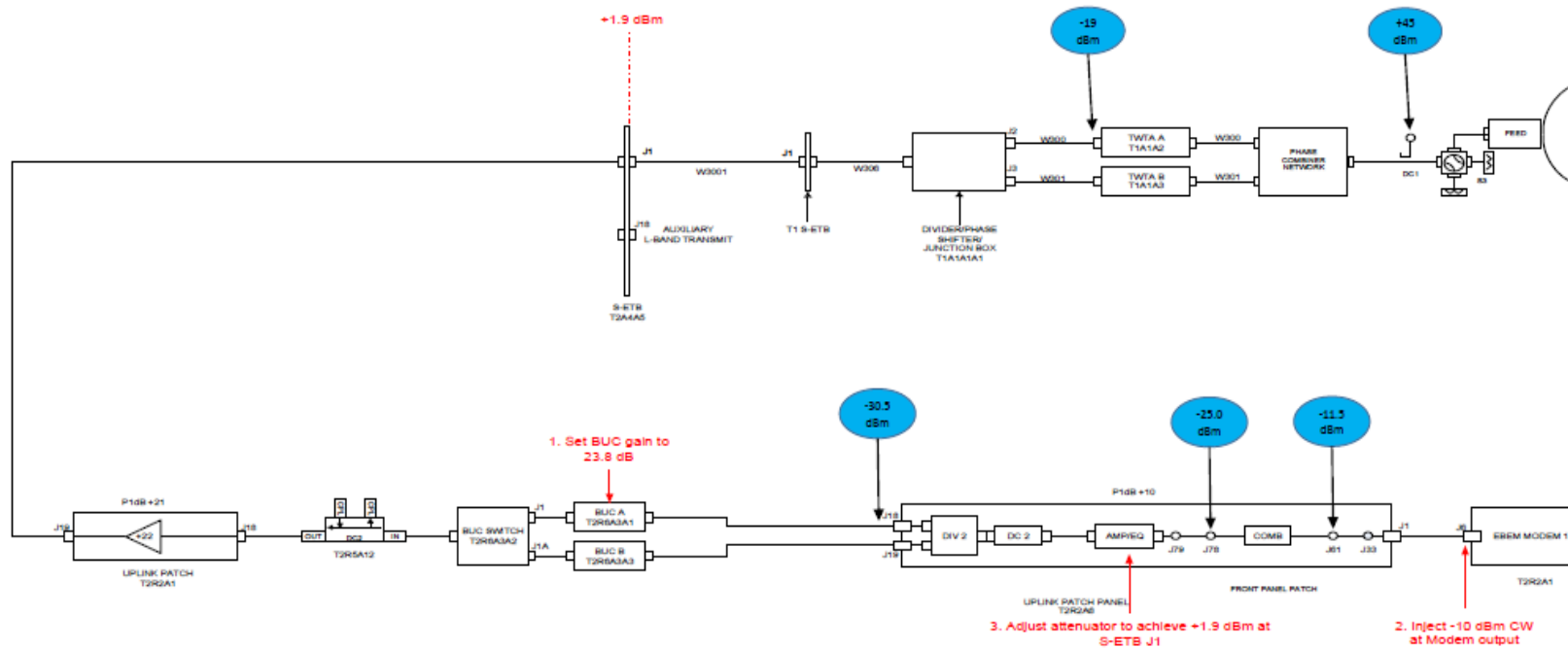
PROCEDURE / REPORT OF TEST N° 1.2.6 & 1.2.7				
TEST NAME: T2 Power Balancing		ELEMENT UNDER TEST: TX Subsystem		PROJECT: TSGT-DSO
13.	Set Equalizer in CIRCUIT and Change T2 Attenuator Settings in the Equalizer to get below readings @ Antenna Output Coupler.	OUTPUT: +51dbm		
14.	-Select BUC A + SSPA A Adjust/Change the Preset Attenuator value SSPA A to read +51dBm output power on the Power Meter.	+51dbm		
15.	Select BUC A + SSPA B Adjust/Change the Preset Attenuator value SSPA A to read +51dBm output power on the Power Meter.	+51dbm		
16.	Select BUC A + SSPA A&B COMBINED Adjust/Change the Preset Attenuator value to read +51dBm output power on the Power Meter.	+51dbm		
17.	Select BUC B + SSPA A Adjust/Change the Preset Attenuator value SSPA A to read +51dBm output power on the Power Meter.	+51dbm		
18.	-Select BUC B + SSPA B Adjust/Change the Preset Attenuator value SSPA A to read +51dBm output power on the Power Meter.	+51dbm		
19.	-Select BUC B + SSPA A&B COMBINED Adjust/Change the Preset Attenuator value to read +51dBm output power on the Power Meter.	+51dbm		
20.	Transmit with SSPA, 'A' only, 'B' only and COMBINED. Record the EIRP as reported by MACS		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
21.	SSPA 'A' 51dbm out+44dbm Ant. Gain=95dbm-30db=65.0dBW	65.0dbw		

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PROCEDURE / REPORT OF TEST N° 1.2.6 & 1.2.7				
TEST NAME: T2 Power Balancing	ELEMENT UNDER TEST: TX Subsystem			PROJECT: TSGT-DSO
22.	SSPA 'B' 51dbm out+44dbm Ant. Gain=95dbm-30db=65.0dBW	65.0dbw		
23.	Combined SSPAs 65.0dBW	65.0dbw		
24.	Stick a new label (current Date) above the adjustment trimmer on both BUCs after calibration.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
25.	Save and Print screen Pre-set Equalizer Attenuator final values. For T2		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

3. Set T-1 Tx Gain to 105 dB

1. Verify gain of each BUC is set to 23.8 dB.
2. Inject a 1200 MHz CW with a level of -10 dBm at the output of EBEM Modem #1
3. Adjust the Slope Equalizer attenuator to achieve a level of +1.9 dBm at T-1 Extension ETB J1. (When No trailer present)
4. Adjust the Slope Equalizer attenuator to achieve a level of -19.0 dBm at the HPA input.
5. Adjust the HPA attenuators to achieve a level of +45.0 dBm, at the output of each HPA.
6. Adjust the Slope Equalizer attenuator to achieve a level of +45 dBm at the HPA output for all HPA/BUC combinations.



1.3.3.2 T1-TX POWER BALANCING AND PHASE ALIGNMENT

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PROCEDURE / REPORT OF TEST N° 1.3.3.1 & 1.3.3.2				
TEST NAME: T1 Power Balancing		ELEMENT UNDER TEST: TX Subsystem		PROJECT: TSGT-DSO
STEP	TEST SEQUENCE	EXPECTED RESULT	RESULT	REMARKS
1.	Configure Test setup as indicated. TSGT-3G_PowerBalancing_PhaseAlignment_Procedure 3G_PowerBalancing_PhaseAlignment_Procedure Point the T-1 antenna to Elevation >60 degrees.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
2.	Perform Power balancing, Phase alignment and Slope adjustment. Antenna moved to out of Satellite region. EL: 60 degree, Or TX Output connected to LOAD. -Equalizer Bypassed. -Inject 1.2 GHz, -11.5 dBm CW to the L Band P/P. 1. POWER Meter Connected to the INPUT Cable of the HPA A and then, HPA B -Adjust BUC A GAIN Potentiometer to read -19dbm on the POWER Meter. -Switchover to BUC B --If not, Adjust the gain of the BUC A&B and label it.	T1 HPA A: -19dBm		
3.	Adjust BUC B GAIN Potentiometer to read -19dbm on the POWER meter. -If not, Adjust the gain of the BUC A&B and label it.	T1 HPA B: -19dBm		
4.	Set BUC'A' via HPA'A' and measure the output level of the HPA (+45dBm) @ Antenna Output Coupler If not, Adjust/Set HPA A Attenuator to read +45dbm on the Power meter.	+45dBm		
5.	Set BUC'A' via HPA'B' and measure the output level of the HPA (+45dBm) @ Antenna Output Coupler If not, Adjust/Set HPA B Attenuator to read +45dbm on the Power meter.	+45dBm		

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PROCEDURE / REPORT OF TEST N° 1.3.3.1 & 1.3.3.2				
TEST NAME: T1 Power Balancing	ELEMENT UNDER TEST: TX Subsystem	PROJECT: TSGT-DSO		
6.	-Set BUC'A' via HPA 'A and B' COMBINED to the LOAD, measure the output level of the Both HPA (+48dBm) @ Antenna Output Coupler -Adjust Phase Combiner until you see maximum peak for +48dbm on the Power meter.	+48dBm (Power doubled and 3db increased)		
7.	-Set BUC'B' via HPA'A' and measure the output level of the HPA (+45dBm) @ Antenna Output Coupler	+45dBm		
8.	-Set BUC'B' via HPA'B' and measure the output level of the HPA (+45dBm) @ Antenna Output Coupler	+45dBm		
9.	-Set BUC'B' via HPA A and B COMBINED to the LOAD, measure the output level of the Both HPA (+48dBm) @ Antenna Output Coupler.	+48dBm (Power doubled and 3db increased)		
10.	Record Attenuator set up on both HPA's and DO NOT play/change them. HPA #A	Attenuator final Value		
11.	Record Attenuator set up on both HPA's and DO NOT play/change them. HPA #B	Attenuator final Value		
Capture Pictures print screens on ASNMC GUI: HPA A&B Attenuation.				
10.	Set Equalizer in CIRCUIT and Change T1 Attenuator Settings in the Equalizer to get below readings @ Antenna Output Coupler.			
11.	-Select BUC A + HPA A Adjust/Change the Preset Attenuator value HPA A to read +45dBm output power on the Power Meter.	+45dbm		
12.	-Select BUC A + HPA B	+45dbm		

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PROCEDURE / REPORT OF TEST N° 1.3.3.1 & 1.3.3.2				
TEST NAME: T1 Power Balancing		ELEMENT UNDER TEST: TX Subsystem		PROJECT: TSGT-DSO
	Adjust/Change the Preset Attenuator value HPA B to read +45dBm output power on the Power Meter.			
13.	-Select BUC A + HPA A&B COMBINED Adjust/Change the Preset Attenuator value to read +45dBm output power on the Power Meter.	+45dbm		
14.	-Select BUC B + HPA A Adjust/Change the Preset Attenuator value HPA A to read +45dBm output power on the Power Meter.	+45dbm		
15.	-Select BUC B + HPA B Adjust/Change the Preset Attenuator value HPA A to read +45dBm output power on the Power Meter.	+45dbm		
16.	-Select BUC B + HPA A&B COMBINED Adjust/Change the Preset Attenuator value to read +45dBm output power on the Power Meter.	+45dbm		
17.	Check that the reading on the Block Diagram EIRP matches with the All measurement. Radiate with HPA, 'A'. Record the EIRP as reported by MACS. HPA 'A' 45dbm out+50dbm Ant. Gain=95dbm-30db=65.0dBW	65dbw		
18.	Check that the reading on the Block Diagram EIRP matches with the All measurement. Radiate with HPA, 'B'. Record the EIRP as reported by MACS. HPA 'B' 45dbm out+50dbm Ant. Gain=95dbm-30db=65.0dBW	65dbw		

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PROCEDURE / REPORT OF TEST N° 1.3.3.1 & 1.3.3.2				
TEST NAME: T1 Power Balancing	ELEMENT UNDER TEST: TX Subsystem	PROJECT: TSGT-DSO		
19.	Check that the reading on the Block Diagram EIRP matches with the All measurement. Radiate with HPA, COMBINED. Record the EIRP as reported by MACS. Combined HPAs 65.0dBW	65dbw		
20.	Stick a new label (Current Date) above the adjustment trimmer on both BUC's after calibration.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
21.	Save and Print screen Pre-set Equalizer Att. final set up on the ASNMC HPA's GUI		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

1.3.4 TX FREQUENCY RESPONSE FLATNESS TEST IN THE WHOLE BAND

PROCEDURE / REPORT OF TEST N° 1.3.4				
TEST NAME: Frequency Response flatness test in the whole Band T2 & T1		ELEMENT UNDER TEST: Transmission Subsystem		PROJECT: TSGT-DSO
STEP	TEST SEQUENCE	EXPECTED RESULT	RESULT	REMARKS
1.	Prepare set up as indicated on the Test procedure, 20151108-NU-TSGT-3G_PowerBalancing_PhaseAlignment_Procedure Set T2 Antenna and T2 Presets and point the antenna away from any satellite. Adjust/Change Slope values to get a good picture. Apply Procedure/test for the below combinations and record and print test results			
2.	BUC-A > SSPA –A	Save the trace as a JPEG file. Note the SSPA attenuator value.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

Marker	Frequency (GHz)	Amplitude (dB)
1	7.900000	11.347
2	8.150000	11.948
>3	8.400000	11.737

3.	BUC-A > SSPA -B	Save the trace as a JPEG file. Note the SSPA attenuator value.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
----	-----------------	---	---

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E5071C Network Analyzer
1 Active Ch/Trace 2 Response 3 Stimulus 4 Mkr/Analysis 5 Instr State
Resize

▶ **Tr1** S21 Log Mag 1.000dB/ Ref 13.20dB [S2 Smo]

1	7.9000000	GHZ	11.320	dB
2	8.1500000	GHZ	10.635	dB
>3	8.4000000	GHZ	10.677	dB

Port 1: Start 950 MHz
Port 2: Start 7.9 GHz

Stop 1.45 GHz
Stop 8.4 GHz

1 Center 1.2 GHz IFBW 70 kHz Span 500 MHz 16/16 Cor Ofs

Meas Stop ExtRef Svc

System

Print

Invert Image
ON

Dump
Screen Image...

Multiport Test Set
Setup

Misc Setup

Backlight
ON

Firmware
Revision

Service Menu

Help

Return

2020-03-05 21:16

4.

BUC-A > SSPA A+B COMBINED

Save the trace as a JPEG file.
Note the SSPA attenuator value.

Passed Failed

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E5071C Network Analyzer

1 Active Ch/Trace 2 Response 3 Stimulus 4 Mkr/Analysis 5 Instr State

▶ S21 Log Mag 1.000dB/ Ref 13.20dB [S2 Smo]

1	7.900000 GHz	11.815 dB
2	8.150000 GHz	12.897 dB
>3	8.400000 GHz	12.995 dB

Port 1: Start 950 MHz Stop 1.45 GHz
 Port 2: Start 7.9 GHz Stop 8.4 GHz

1 Center 1.2 GHz IFBW 70 kHz Span 500 MHz 16/16 Cor Ofs

Meas Stop ExtRef Svc 2020-03-05 21:17

System

Print

Invert Image
ON

Dump
Screen Image...

Multiport Test Set
Setup

Misc Setup

Backlight
ON

Firmware
Revision

Service Menu

Help

Return

5.

BUC-B > SSPA A

Save the trace as a JPEG file.
Note the SSPA attenuator value.

Passed Failed

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6.	BUC-B > SSPA B	Save the trace as a JPEG file. Note the SSPA attenuator value.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed

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E5071C Network Analyzer

1 Active Ch/Trace 2 Response 3 Stimulus 4 Mkr/Analysis 5 Instr State

▶ S21 Log Mag 1.000dB/ Ref 13.20dB [S2 Smo]

1	7.900000	GHZ	12.012	dB
2	8.150000	GHZ	12.457	dB
>3	8.400000	GHZ	13.011	dB

Port 1: Start 950 MHz
Port 2: Start 7.9 GHz
Center 1.2 GHz
IFBW 70 kHz
Span 500 MHz 16/16 Cor Ofs
Meas Stop ExtRef Svc

System

Print

Invert Image
ON

Dump
Screen Image...

Multiport Test Set
Setup

Misc Setup

Backlight
ON

Firmware
Revision

Service Menu

Help

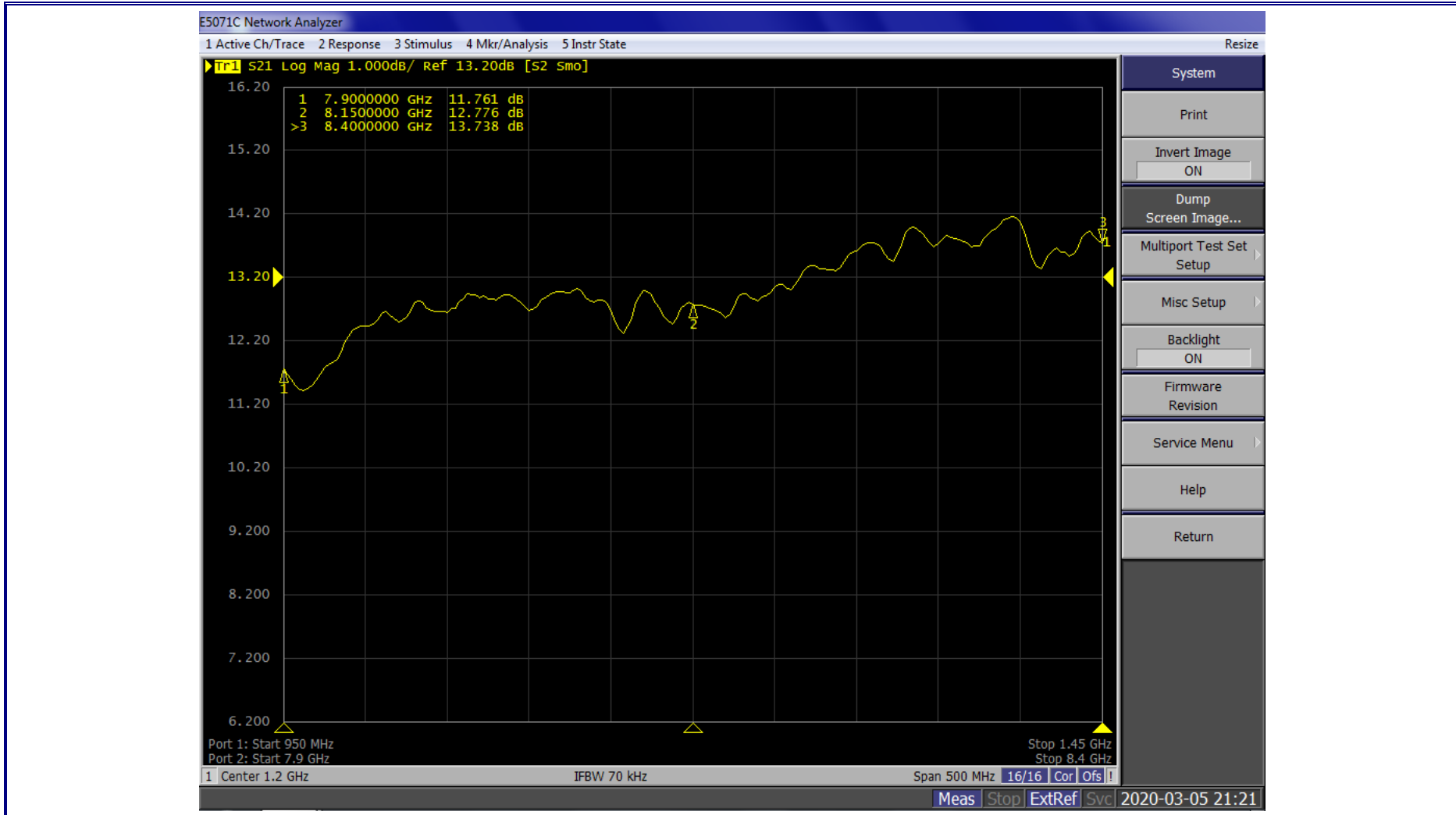
Return

7.

BUC-B > SSPA A+B COMBINED

Save the trace as a JPEG file.
Note the SSPA attenuator value.

Passed Failed



8.	Prepare set up as indicated on the Test procedure, 20151108-NU-TSGT-3G_PowerBalancing_PhaseAlignment_Procedure			
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	Set T1 Antenna and T1 Presets and point the antenna away from any satellite. (OLUX matched with OLTX)			
9.	T1 BUC-A > HPA - A	Save the trace as a JPEG file. Note the HPA attenuator value	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
10	T1 BUC-A > HPA - B	Save the trace as a JPEG file. Note the HPA attenuator value	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
11.	T1 BUC-A > HPA A+B COMBINED	Save the trace as a JPEG file. Note the HPA attenuator value	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
12.	T1 BUC-B > HPA- A	Save the trace as a JPEG file. Note the HPA attenuator value	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
13.	T1 BUC-B > HPA -B	Save the trace as a JPEG file. Note the HPA attenuator value	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
14.	T1 BUC-B > HPA A+B COMBINED	Save the trace as a JPEG file. Note the HPA Attenuator value	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

1.3.5 TX Spurious Test

PROCEDURE / REPORT OF TEST N° 1.3.5				
TEST NAME: TX Spurious		ELEMENT UNDER TEST: Transmission Subsystem		PROJECT: TSGT-DSO
STEP	TEST SEQUENCE	EXPECTED RESULT	RESULT	REMARKS
<pre> graph LR SA[Spectrum Analyser] --- DC1[DC1] DC1 --- AF[Antenna Feed] DC1 --- TWTA[TWTA] AF --- LNA[LNA] LNA --- BDC[BDC] BDC --- DP[Downlink P/P] TWTA --- BUC[BUC] BUC --- UP[Uplink P/P] UP --- M1[Modem FDMA 1] </pre>				
1.	Configure Test setup as indicated in test procedure 'SPURIORS' Connect the spectrum analyser to test point T2 DC1 or FWD PWR Sample at RF Mon & Test Patch Panel.			

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PROCEDURE / REPORT OF TEST N° 1.3.5				
	TEST NAME: TX Spurious	ELEMENT UNDER TEST: Transmission Subsystem	PROJECT: TSGT-DSO	
2.	Select Up-converter T2 A on-line and SSPA A + B on line. Find and measure the spurious level. Record the results on the form. Find the relative dBc between the fundamental carrier and the maximum spurious that appears. Record the results	Take note of the power required at modem output. Record the results on the form.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
3.	Select Up-converter T2 B on-line and SSPA A + B on line. Find and measure the spurious level. Record the results on the form. Find the relative dBc between the fundamental carrier and the maximum spurious that appears. Record the results	Take note of the power required at modem output. Record the results on the form.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
4.	Configure Test setup as indicated in test procedure ‘SPURIORS’ Connect the spectrum analyser to test point T1 DC1 or FWD PWR Sample at RF Mon & Test Patch Panel.			
5.	Select Up-converter T1 A and TWTA A + B on line. Find and measure the spurious level. Record the results on the form. Find the relative dBc between the fundamental carrier and the maximum spurious that appears. Record the results	Take note of the power required at modem output. Record the results on the form.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
6.	Select Up-converter T1 B and TWTA A + B on line. Find and measure the spurious level. Record the results on the form. Find the relative dBc between the fundamental carrier and the maximum spurious that appears. Record the results	Take note of the power required at modem output. Record the results on the form.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

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Independent spurious (frequency (MHz) and power level (dBm))		T2 BUC-A SSPA A+B	T2 BUC-B SSPA A+B	T1 BUC-A HPA A+B	T1 BUC-B HPA A+B
TX @ 952.5 MHz					
TX @ 1200 MHz					
TX @ 1447.5 MHz					
Dependent spurious (frequency (MHz) and relative power level (dBc))					
TX @ 952.5 MHz	Fundamental: Spurious:				
Tx @ 1200 MHz	Fundamental: Spurious:				
Tx @ 1447.5 MHz	Fundamental: Spurious:				
Spurious inside 2 MHz BW centred around carrier (dBc)					
Tx @ 952.5 MHz					
Tx @ 1200 MHz					
Tx @ 1447.5 MHz					
Spurious power supply related (dBc)					
Tx @ 952.5 MHz					
Tx @ 1200 MHz					
Tx @ 1447.5 MHz					

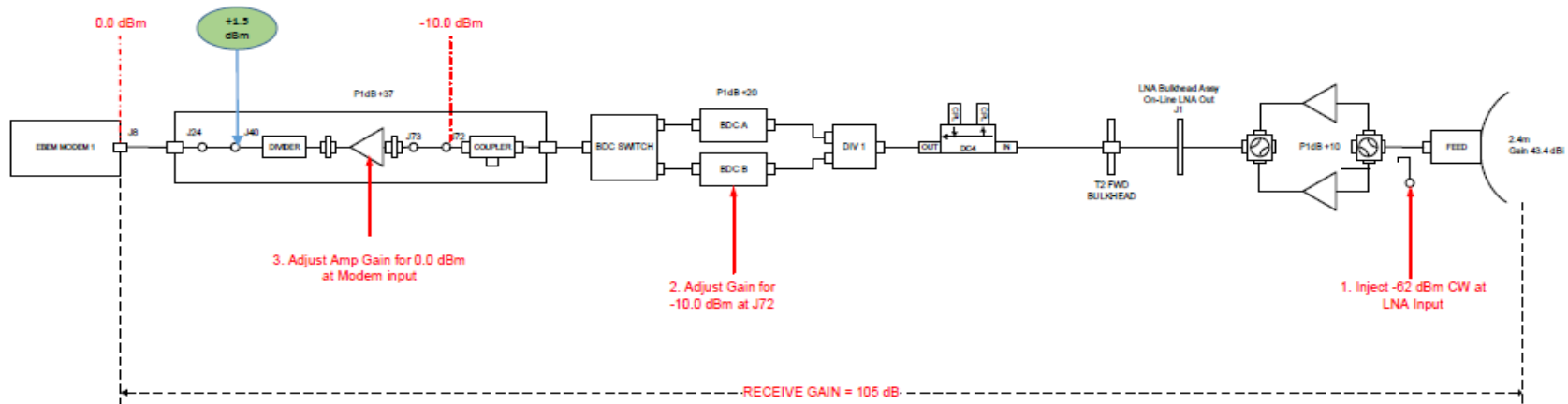
1.3 RX SUBSYSTEM

1.3.1 RX GAIN

1.3.1.1 T2- RX RECEIVE CHAIN LEVEL ALIGNMENT

2. Set T-2 Rx Gain to 105 dB

1. Inject a 7500 MHz CW with a level of -62 dBm at LNA on-line inject coupler (DC4).
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 the input to Modem #1.



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PROCEDURE / REPORT OF TEST N° 1.3.1.1				
TEST NAME: T2-RX Power Balancing		ELEMENT UNDER TEST: RX Subsystem		PROJECT: TSGT-DSO
STEP	TEST SEQUENCE	EXPECTED RESULT	RESULT	REMARKS
1.	Configure Test setup as indicated in test procedure Depot Level CSSC/SATCOM 1.4.3_20170207-NU-TSGT3G_RX_Chain Calibration Point the T-2 antenna to Elevation of >60 degrees Make sure that the Cable Loss and Coupling factors for the test points on the Test Panel are measured and labeled with the right values.			
2.	Set CW 7.5Ghz, Signal Generator Power output that injecting to LNA - 62.0dBm input to the coupler (50.38dbc) T2 Online LNA A IN		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
3.	Set LNA A and BDC A ON LINE and Connect the power meter to the J72 at L Band DOWNLINK P/P. Measure the output of the BDC A and adjust the output level for -10dbm (1.2Ghz)	-10dBm		
4.	Set LNA A and BDC B ON LINE and Connect the power meter to the J72 at L Band DOWNLINK P/P. Measure the output of the BDC B and adjust the output level for -10dbm (1.2Ghz)	-10dBm		
5.	Connect the power meter to the down-link splitter output connector FDMA 1 at the Downlink Patch Panel Set LNA'A' via BDC'A', read and record the power level. Adjust the LINE Amplifier if required to 0dbm.	+0.0dBm		
6.	Set LNA'A' via BDC'B', read and record the power level.	+0.0dBm		
7.	Set LNA'B' via BDC'A', read and record the power level.	+0.0dBm		

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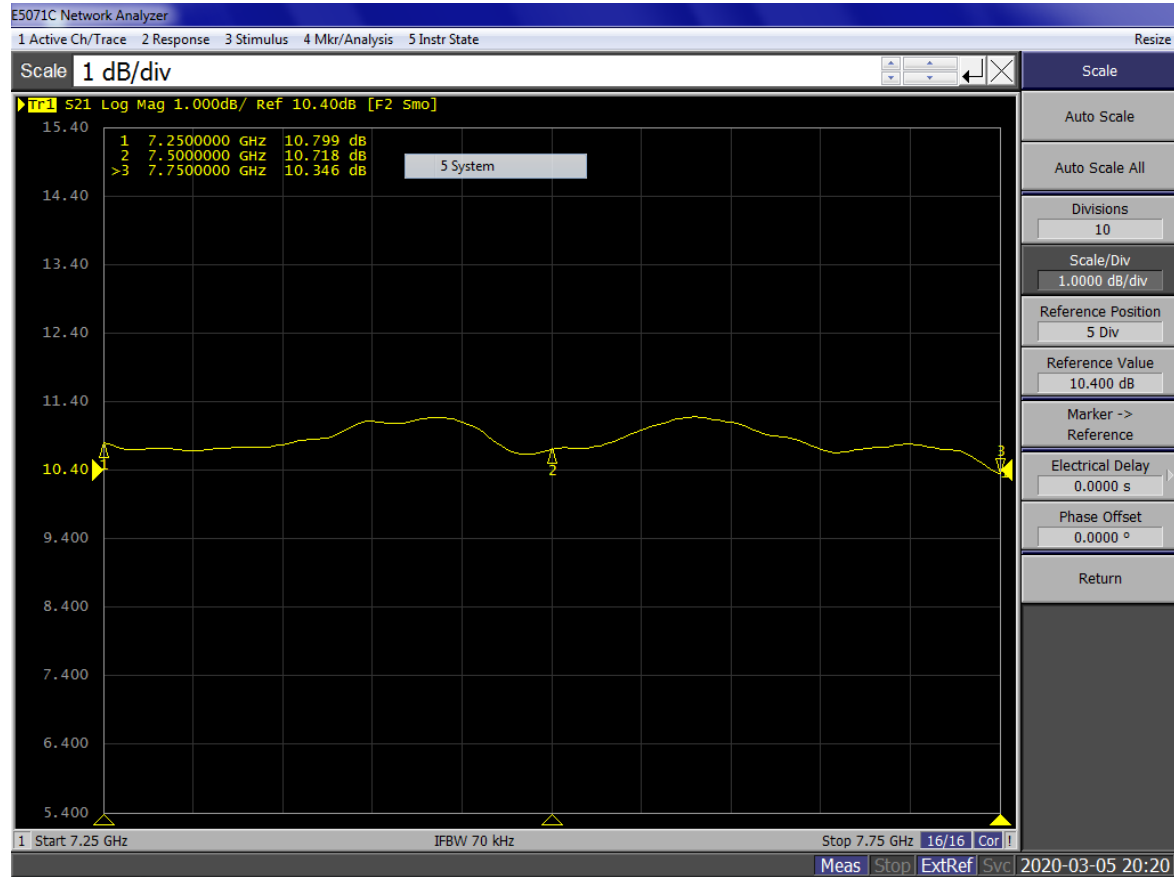
PROCEDURE / REPORT OF TEST N° 1.3.1.1				
TEST NAME: T2-RX Power Balancing		ELEMENT UNDER TEST: RX Subsystem		PROJECT: TSGT-DSO
8.	Set LNA'B' via BDC'B', read and record the power level.	+0.0dBm		
9.	Stick a new label (current Date) above the adjustment trimmer on both BDC's after calibration.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
10.	Apply Single LNA Gain/Sweep by using ENA or PNA			
11.	T2 LNA A Gain	50dB +- 3 dB		
12.	Save LNA A Sweep test results as a JPEG.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

PROCEDURE / REPORT OF TEST N° 1.3.1.1

TEST NAME: T2-RX Power Balancing

ELEMENT UNDER TEST: RX Subsystem

PROJECT: TSGT-DSO

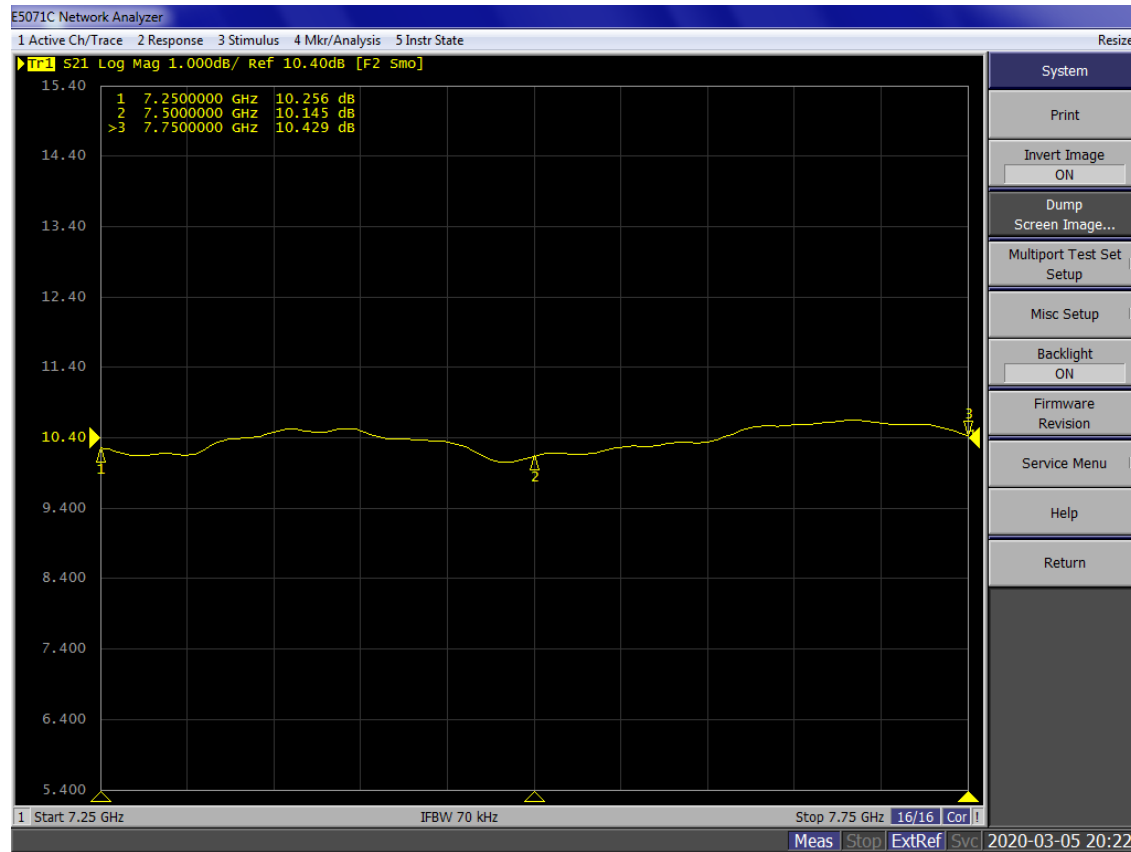


13

Apply Single LNA Gain/Sweep by using ENA or PNA

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PROCEDURE / REPORT OF TEST N° 1.3.1.1				
TEST NAME: T2-RX Power Balancing	ELEMENT UNDER TEST: RX Subsystem			PROJECT: TSGT-DSO
14.	T2LNA B Gain	50 dB +- 3 dB		
15.	Save LNA B Sweep test results as a JPEG.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	



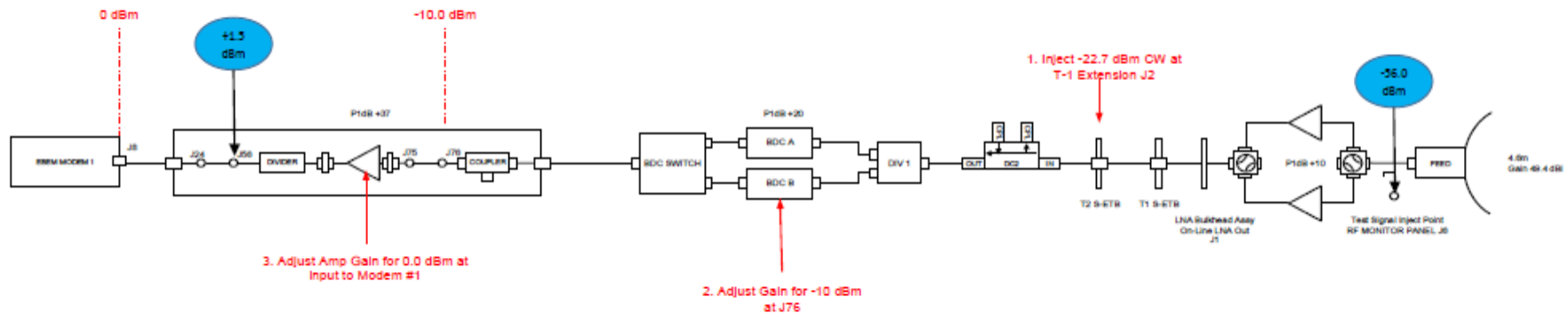
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PROCEDURE / REPORT OF TEST N° 1.3.1.1				
TEST NAME: T2-RX Power Balancing	ELEMENT UNDER TEST: RX Subsystem		PROJECT: TSGT-DSO	
16.	Connect a Multimeter to the T2 LNA A test point on top of the LNA Controller, Check and Adjust POT as required. Log the result.	6.5 Volt for good LNA	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
17.	Connect a Multimeter to the T2 LNA B test point on top of the LNA Controller, Check and Adjust POT as required. Log the result.	6.5 Volt for good LNA	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

1.4.3.2 T1- RX RECEIVE CHAIN LEVEL MEASUREMENT

4. Set T-1 Rx Gain to 105 dB

1. Inject a 7500 MHz CW with a level of **-22.7 dBm** at T-1 Extension **ETB J2**. **(When No trailer present)**
2. Inject a 7500 MHz CW with a level of **-56 dBm** at **T-1 LNA DC Coupler**.
3. Adjust the gain of each BDC to achieve a level of **-10 dBm** at J76 of Downlink L-Band Patch Panel.
4. 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 **Modem #1**



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PROCEDURE / REPORT OF TEST N° 1.4.3.2				
TEST NAME: T1 RX Power Balancing		ELEMENT UNDER TEST: RX Subsystem		PROJECT: TSGT-DSO
STEP	TEST SEQUENCE	EXPECTED RESULT	RESULT	REMARKS
1.	Configure Test setup as indicated in test procedure Depot Level CSSC/SATCOM TSGT3G_RX_Chain Calibration Point the T-1 antenna to an elevation of >60 degrees (T1 is OTQX) Make sure that the Cable Loss and Coupling factors for the test points on the Test Panel are measured and labeled with the right value.			
2.	Apply Single LNA Gain/Sweep by using ENA or PNA			
3.	T1LNA A Gain	50 dB +- 3 dB		
4.	Save LNA A Sweep test results as a JPEG.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
5.	Apply Single LNA Gain/Sweep by using ENA or PNA			
6.	T1LNA B Gain	50 dB +- 3 dB		
7.	Save LNA B Sweep test results as a JPEG.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
8.	Calculated LNA GAIN Difference	< 1 dB		

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PROCEDURE / REPORT OF TEST N° 1.4.3.2				
TEST NAME: T1 RX Power Balancing	ELEMENT UNDER TEST: RX Subsystem		PROJECT: TSGT-DSO	
9.	Set Signal Generator Power output CW that injecting to LNA -56.0dBm T1 Online LNA @ RF INPUT Coupler on the upper side of the LNAs.			
10.	Set LNA A and BDC A ON LINE and Connect the power meter to the J72 at L Band DOWNLINK P/P. Measure the output of the T1 BDC A and adjust the output level for -10dbm (1.2Ghz)	-10dBm		
11.	Set LNA A and BDC B ON LINE and Connect the power meter to the J72 at L Band DOWNLINK P/P. Measure the output of the BDC B and adjust the output level for -10dbm (1.2Ghz)	-10dbm		
12.	Connect the power meter to the downlink, splitter output connector, FDMA 1 at the Downlink Patch Panel.			
13.	Set LNA'A' via BDC'A', read and record the power level. Adjust the T1 LINE Amplifier if required to 0dbm	+0.0dB		
14.	Set LNA'A' via BDC'B', read and record the power level.	+0.0dBm		
15.	Set LNA'B' via BDC'A', read and record the power level.	+0.0dBm		
16.	Set LNA'B' via BDC'B', read and record the power level.	+0.0dbm		
17.	Stick a new label (current Date) above the adjustment trimmer on both BDC's after calibration.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
18.	Connect a Multimeter to the T1 LNA A test point on top of the LNA Controller, Check and Adjust POT as required. Log the result.	6.5 Volt for good LNA	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
19.	Connect a Multimeter to the T1 LNA B test point on top of the LNA Controller, Check and Adjust POT as required. Log the result.	6.5 Volt for good LNA	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

1.3.2 T2 RX FREQUENCY RESPONSE IN WHOLE BAND

PROCEDURE / REPORT OF TEST N° 1.3.2				
TEST NAME: T2 Frequency response in whole band		ELEMENT UNDER TEST: Reception Subsystem		PROJECT: TSGT-DSO
STEP	TEST SEQUENCE	EXPECTED RESULT	RESULT	REMARKS
1.	<p>Configure Test setup as indicated in test procedure CSSC/SATCOM RX FREQUENCY RESPONSE TEST PROCEDURE for T2 antenna setup</p> <p>Ensure that the antenna is not pointed on any satellite</p> <p>Connect the Network Analyzer PORT1 to LNA INPUT Coupler and PORT2 to the DOWNLINK P/P Modem 1. U link is removed,</p> <p>Measure the amplitude versus frequency response X-BAND to LBAND.</p>		OK	
2.	T2 LNA A- BDC A	<p>$\leq \pm 2$ dB</p> <p>Save the trace as a JPEG</p>	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

PROCEDURE / REPORT OF TEST N° 1.3.2				
TEST NAME: T2 Frequency response in whole band	ELEMENT UNDER TEST: Reception Subsystem	PROJECT: TSGT-DSO		
3.	T2 LNA A- BDC B	<± 2 dB	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	Save the trace as a JPEG

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PROCEDURE / REPORT OF TEST N° 1.3.2			
TEST NAME: T2 Frequency response in whole band	ELEMENT UNDER TEST: Reception Subsystem	PROJECT: TSGT-DSO	
4.	T2 LNA B- BDC B	$\leq \pm 2$ dB Save the trace as a JPEG	<input type="checkbox"/> Passed <input type="checkbox"/> Failed

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PROCEDURE / REPORT OF TEST N° 1.3.2			
TEST NAME: T2 Frequency response in whole band	ELEMENT UNDER TEST: Reception Subsystem	PROJECT: TSGT-DSO	
5.	T2 LNA B- BDC A	$\leq \pm 2$ dB Save the trace as a JPEG	<input type="checkbox"/> Passed <input type="checkbox"/> Failed

PROCEDURE / REPORT OF TEST N° 1.3.2			
TEST NAME: T2 Frequency response in whole band	ELEMENT UNDER TEST: Reception Subsystem	PROJECT: TSGT-DSO	
5.	Configure Test setup as indicated in test procedure CSSC/SATCOM	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

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PROCEDURE / REPORT OF TEST Nº 1.3.2				
TEST NAME: T2 Frequency response in whole band	ELEMENT UNDER TEST: Reception Subsystem		PROJECT: TSGT-DSO	
	RX_FREQUENCY_RESPONSE_TEST_PROCEDURE for T1 antenna setup Connect the Network Analyzer PORT1 to LNA INPUT Coupler and PORT2 to the DOWNLINK P/P Modem 1. U link is removed, Measure the amplitude versus frequency response X-BAND to LBAND.			
6.	T1 LNA A- BDC A	<± 2 dB Save the trace as a JPEG	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
7.	T1 LNA A- BDC B	<± 2 dB Save the trace as a JPEG	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
8.	T1 LNA B- BDC A	<± 2 dB Save the trace as a JPEG	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
9.	T1 LNA B- BDC B	<± 2 dB Save the trace as a JPEG	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

1.3.3 RX Spurious T1&T2

PROCEDURE / REPORT OF TEST N° 1.3.3				
TEST NAME: T2 RX Spurious		ELEMENT UNDER TEST: Reception Subsystem		PROJECT: TSGT-DSO
STEP	TEST SEQUENCE	EXPECTED RESULT	RESULT	REMARKS
1.	<p>Configure Test setup as indicated in test procedure RX Spurious Test” for T2 antenna setup Ensure that the antenna is not pointed on any satellite Connect the Network Analyser to the ports as indicated in Figure.</p> <p>Find and measure independent spurious level, if any.</p>			
2.	<p>Select T2 LNA A and Down-converter A. on-line. Apply procedure.</p> <p>Record the results. To the specific spurious test data sheet and Plot /Save Attach interesting plots showing spurious if any;</p>	< 30dBc		

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PROCEDURE / REPORT OF TEST N° 1.3.3				
TEST NAME: T2 RX Spurious	ELEMENT UNDER TEST: Reception Subsystem	PROJECT: TSGT-DSO		
3.	Select T2 LNA A and Down-converter B. on-line. Apply procedure. Record the results. To the specific spurious test data sheet and Plot /Save Attach interesting plots showing spurious if any;	< 30dBc		
4.	Select T2 LNA B and Down-converter A. on-line. Apply procedure. Record the results. To the specific spurious test data sheet and Plot /Save Attach interesting plots showing spurious if any;	< 30dBc		
5.	Select T2 LNA B and Down-converter Bon-line. Apply procedure. Record the results. To the specific spurious test data sheet and Plot /Save Attach interesting plots showing spurious if any;	< 30dBc		

Results:

RX Spurious : T2 LNA A DOWN CONVERTER A

Independent spurious (frequency, level and RBW)				
Dependent spurious (frequency, level, RBW and dBc)				
Tx @ 950 MHz	Fundamental: Spurious:			
Tx @ 1200 MHz	Fundamental: Spurious:			
Tx @ 1450 MHz	Fundamental: Spurious:			
Spurious inside 2 MHz BW centred around carrier (dBc)				
Tx @ 950 MHz				
Tx @ 1200 MHz				
Tx @ 1450 MHz				
Spurious power supply related (dBc)				
Tx @ 950 MHz				
Tx @ 1200 MHz				
Tx @ 1450 MHz				
Signal Frequency	Loss between RF Mon & Test P/P and LNA input	Signal occupied bandwidth	Signal Power level measured	Signal Power level at LNA input
FUNDAMENTAL:				
SPURIOUS 1:				
SPURIOUS 2:				
SPURIOUS 3:				
SPURIOUS 4:				

Results:

RX Spurious : T2 LNA A DOWN CONVERTER B

Independent spurious (frequency, level and RBW)				
Dependent spurious (frequency, level, RBW and dBc)				
Tx @ 950 MHz	Fundamental: Spurious:			
Tx @ 1200 MHz	Fundamental: Spurious:			
Tx @ 1450 MHz	Fundamental: Spurious:			
Spurious inside 2 MHz BW centred around carrier (dBc)				
Tx @ 950 MHz				
Tx @ 1200 MHz				
Tx @ 1450 MHz				
Spurious power supply related (dBc)				
Tx @ 950 MHz				
Tx @ 1200 MHz				
Tx @ 1450 MHz				
Signal Frequency	Loss between RF Mon & Test P/P and LNA input	Signal occupied bandwidth	Signal Power level measured	Signal Power level at LNA input
FUNDAMENTAL:				
SPURIOUS 1:				
SPURIOUS 2:				
SPURIOUS 3:				
SPURIOUS 4:				

Results:

RX Spurious : T2 LNA B DOWN CONVERTER A

Independent spurious (frequency, level and RBW)				
Dependent spurious (frequency, level, RBW and dBc)				
Tx @ 950 MHz	Fundamental: Spurious:			
Tx @ 1200 MHz	Fundamental: Spurious:			
Tx @ 1450 MHz	Fundamental: Spurious:			
Spurious inside 2 MHz BW centred around carrier (dBc)				
Tx @ 950 MHz				
Tx @ 1200 MHz				
Tx @ 1450 MHz				
Spurious power supply related (dBc)				
Tx @ 950 MHz				
Tx @ 1200 MHz				
Tx @ 1450 MHz				
Signal Frequency	Loss between RF Mon & Test P/P and LNA input	Signal occupied bandwidth	Signal Power level measured	Signal Power level at LNA input
FUNDAMENTAL:				
SPURIOUS 1:				
SPURIOUS 2:				
SPURIOUS 3:				
SPURIOUS 4:				

Results:

RX Spurious : T2 LNA B DOWN CONVERTER B

Independent spurious (frequency, level and RBW)				
Dependent spurious (frequency, level, RBW and dBc)				
Tx @ 950 MHz		Fundamental: Spurious:		
Tx @ 1200 MHz		Fundamental: Spurious:		
Tx @ 1450 MHz		Fundamental: Spurious:		
Spurious inside 2 MHz BW centred around carrier (dBc)				
Tx @ 950 MHz				
Tx @ 1200 MHz				
Tx @ 1450 MHz				
Spurious power supply related (dBc)				
Tx @ 950 MHz				
Tx @ 1200 MHz				
Tx @ 1450 MHz				
Signal Frequency	Loss between RF Mon & Test P/P and LNA input	Signal occupied bandwidth	Signal Power level measured	Signal Power level at LNA input
FUNDAMENTAL:				
SPURIOUS 1:				
SPURIOUS 2:				
SPURIOUS 3:				
SPURIOUS 4:				

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PROCEDURE / REPORT OF TEST N° 1.3.3				
TEST NAME: T1 RX Spurious	ELEMENT UNDER TEST: Reception Subsystem	PROJECT: TSGT-DSO		
STEP	TEST SEQUENCE	EXPECTED RESULT	RESULT	REMARKS
1.	Configure Test setup as indicated in test procedure RX Spurious Test” for T1 antenna setup Ensure that the antenna is not pointed on any satellite Connect the Network Analyser to the ports as indicated in Figure. Find and measure independent spurious level, if any.			
2.	Select T1 LNA A and Down-converter A. on-line. Apply procedure. Record the results. To the specific spurious test data sheet and Plot /Save Attach interesting plots showing spurious if any;	< 30dBc		
3.	Select T1 LNA A and Down-converter B. on-line. Apply procedure.	< 30dBc		

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PROCEDURE / REPORT OF TEST Nº 1.3.3					
TEST NAME: T1 RX Spurious	ELEMENT UNDER TEST: Reception Subsystem			PROJECT: TSGT-DSO	
	Record the results. To the specific spurious test data sheet and Plot /Save Attach interesting plots showing spurious if any;				
4.	Select T1 LNA B and Down-converter A. on-line. Apply procedure. Record the results. To the specific spurious test data sheet and Plot /Save Attach interesting plots showing spurious if any;	< 30dBc			
5.	Select T1 LNA B and Down-converter Bon-line. Apply procedure. Record the results. To the specific spurious test data sheet and Plot /Save Attach interesting plots showing spurious if any;	< 30dBc			

Results:

RX Spurious : T1 LNA A DOWN CONVERTER A

Independent spurious (frequency, level and RBW)				
Dependent spurious (frequency, level, RBW and dBc)				
Tx @ 950 MHz		Fundamental: Spurious:		
Tx @ 1200 MHz		Fundamental: Spurious:		
Tx @ 1450 MHz		Fundamental: Spurious:		
Spurious inside 2 MHz BW centred around carrier (dBc)				
Tx @ 950 MHz				
Tx @ 1200 MHz				
Tx @ 1450 MHz				
Spurious power supply related (dBc)				
Tx @ 950 MHz				
Tx @ 1200 MHz				
Tx @ 1450 MHz				
Signal Frequency	Loss between RF Mon & Test P/P and LNA input	Signal occupied bandwidth	Signal Power level measured	Signal Power level at LNA input
FUNDAMENTAL:				
SPURIOUS 1:				
SPURIOUS 2:				
SPURIOUS 3:				
SPURIOUS 4:				

Results:

RX Spurious : T1 LNA A DOWN CONVERTER B

Independent spurious (frequency, level and RBW)				
Dependent spurious (frequency, level, RBW and dBc)				
Tx @ 950 MHz		Fundamental: Spurious:		
Tx @ 1200 MHz		Fundamental: Spurious:		
Tx @ 1450 MHz		Fundamental: Spurious:		
Spurious inside 2 MHz BW centred around carrier (dBc)				
Tx @ 950 MHz				
Tx @ 1200 MHz				
Tx @ 1450 MHz				
Spurious power supply related (dBc)				
Tx @ 950 MHz				
Tx @ 1200 MHz				
Tx @ 1450 MHz				
Signal Frequency	Loss between RF Mon & Test P/P and LNA input	Signal occupied bandwidth	Signal Power level measured	Signal Power level at LNA input
FUNDAMENTAL:				
SPURIOUS 1:				
SPURIOUS 2:				
SPURIOUS 3:				
SPURIOUS 4:				

Results:

RX Spurious : T1 LNA B DOWN CONVERTER A

Independent spurious (frequency, level and RBW)				
Dependent spurious (frequency, level, RBW and dBc)				
Tx @ 950 MHz	Fundamental: Spurious:			
Tx @ 1200 MHz	Fundamental: Spurious:			
Tx @ 1450 MHz	Fundamental: Spurious:			
Spurious inside 2 MHz BW centred around carrier (dBc)				
Tx @ 950 MHz				
Tx @ 1200 MHz				
Tx @ 1450 MHz				
Spurious power supply related (dBc)				
Tx @ 950 MHz				
Tx @ 1200 MHz				
Tx @ 1450 MHz				
Signal Frequency	Loss between RF Mon & Test P/P and LNA input	Signal occupied bandwidth	Signal Power level measured	Signal Power level at LNA input
FUNDAMENTAL:				
SPURIOUS 1:				
SPURIOUS 2:				
SPURIOUS 3:				
SPURIOUS 4:				

Results:

RX Spurious : T1 LNA B DOWN CONVERTER B

Independent spurious (frequency, level and RBW)				
Dependent spurious (frequency, level, RBW and dBc)				
Tx @ 950 MHz		Fundamental: Spurious:		
Tx @ 1200 MHz		Fundamental: Spurious:		
Tx @ 1450 MHz		Fundamental: Spurious:		
Spurious inside 2 MHz BW centred around carrier (dBc)				
Tx @ 950 MHz				
Tx @ 1200 MHz				
Tx @ 1450 MHz				
Spurious power supply related (dBc)				
Tx @ 950 MHz				
Tx @ 1200 MHz				
Tx @ 1450 MHz				
Signal Frequency	Loss between RF Mon & Test P/P and LNA input	Signal occupied bandwidth	Signal Power level measured	Signal Power level at LNA input
FUNDAMENTAL:				
SPURIOUS 1:				
SPURIOUS 2:				
SPURIOUS 3:				
SPURIOUS 4:				

1.3.3.1 TX to RX Isolation and TX inter-modulation falling in the RX band Test

PROCEDURE / REPORT OF TEST N° 1.3.3				
TEST NAME: TX to RX Isolation and TX inter-modulation falling in the RX band Test	ELEMENT UNDER TEST: Reception Subsystem		PROJECT: TSGT-DSO	
STEP	TEST SEQUENCE	EXPECTED RESULT	RESULT	REMARKS

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PROCEDURE / REPORT OF TEST N° 1.3.3				
TEST NAME: TX to RX Isolation and TX inter-modulation falling in the RX band Test		ELEMENT UNDER TEST: Reception Subsystem		PROJECT: TSGT-DSO
1	Configure Test setup as indicated in test procedure ‘TX to RX Isolation and TX inter-modulation falling in the RX band Test’ Connect the frequency counter or spectrum analyser to T1 TX DC 1 Select Up-converter A on-line and T1 TWTA A+B to load. Select LNA A on-line and Down-converter A on-line.			
2	Measure any non-desired signal in the whole reception band. Reduce span and RBW & VBW accordingly. Scan the whole band by changing the analyser centre frequency. Record the noise floor at 1450 MHz using Marker Noise Function. Make sure that the antenna is pointed neither on a satellite nor towards any obstacles, which could generate inter-modulation products or increase noise floor. No Tx Carrier		_____ dBm.	
3	Connect T1 TWTA A+B to antenna by means of switch S3 Record the noise floor at 1450 MHz using Marker Noise Function. Change HPA attenuators if necessary up to 0 dB to get maximum power. Record the noise floor at 1450 MHz using Marker Noise Function. Provide spectrum analyser display plots with RF=ON and RF=OFF. One FDMA Carrier Set BW = 512 Kbps. and check results Set BW = 2048 Kbps. and check results	Check that the noise floor does not change by more than 0.5 dB when RF is switched ON and OFF.	_____ dBm. _____ dBm.	

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PROCEDURE / REPORT OF TEST N° 1.3.3				
TEST NAME: TX to RX Isolation and TX inter-modulation falling in the RX band Test		ELEMENT UNDER TEST: Reception Subsystem		PROJECT: TSGT-DSO
	Set BW = 4096 Kbps. and check results Set BW = 8192 Kbps. and check results Switch LNA-B and Set BW = 512 Kbps. and check results Set BW = 2048 Kbps. and check results Set BW = 4096 Kbps. and check results Set BW = 8192 Kbps. and check results		_____ dBm. _____ dBm. _____ dBm. _____ dBm. _____ dBm. _____ dBm.	
4	Two Simultaneous Carriers Set BW at 2 FDMA carriers at 4096 Kbps and check results Switch LNA-B and Set BW at 2 FDMA carriers at 4096 Kbps and check results	Check that the noise floor does not change by more than 0.5 dB when RF is switched ON and OFF.	_____ dBm. _____ dBm.	
5	Four Simultaneous Carriers Set BW at 4 FDMA carriers at 2048 Mbps and check results Switch LNA-B and Set BW at 4 FDMA carriers at 2048 Mbps and check results	Check that the noise floor does not change by more than 0.5 dB when RF is switched ON and OFF.	_____ dBm. _____ dBm.	
6	Four Simultaneous Carriers Set BW at 2 FDMA carriers at 2048 Mbps Set BW at 2 EPM carriers at CW / modulated and check results Switch LNA-B and	Check that the noise floor does not change by more than 0.5 dB when RF is switched ON and OFF.	_____ dBm. _____ dBm.	

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PROCEDURE / REPORT OF TEST N° 1.3.3				
TEST NAME: TX to RX Isolation and TX inter-modulation falling in the RX band Test	ELEMENT UNDER TEST: Reception Subsystem	PROJECT: TSGT-DSO		
	Set BW at 2 FDMA carriers at 2048 Mbps Set BW at 2 EPM carriers at CW / modulated and check results			
7.	Configure Test setup as indicated in test procedure ‘TX to RX Isolation and TX inter-modulation falling in the RX band Test’ Connect the frequency counter or spectrum analyser to T2 TX DC 1 Select Up-converter A on-line and T2 SSPA A+B to load. Select LNA A on-line and Down-converter A on-line.			
8.	Measure any non-desired signal in the whole reception band. Reduce span and RBW & VBW accordingly. Scan the whole band by changing the analyser centre frequency. Record the noise floor at 1450 MHz using Marker Noise Function. Make sure that the antenna is pointed neither on a satellite nor towards any obstacles, which could generate inter-modulation products or increase noise floor. No Tx Carrier		_____dBm.	
9.	Connect T1 TWTA A+B to antenna by means of switch S3 Record the noise floor at 1450 MHz using Marker Noise Function. Change HPA attenuators if necessary up to 0 dB to get maximum power. Record the noise floor at 1450 MHz using Marker Noise Function. Provide spectrum analyser display plots with RF=ON and RF=OFF.	Check that the noise floor does not change by more than 0.5 dB when RF is switched ON and OFF.		

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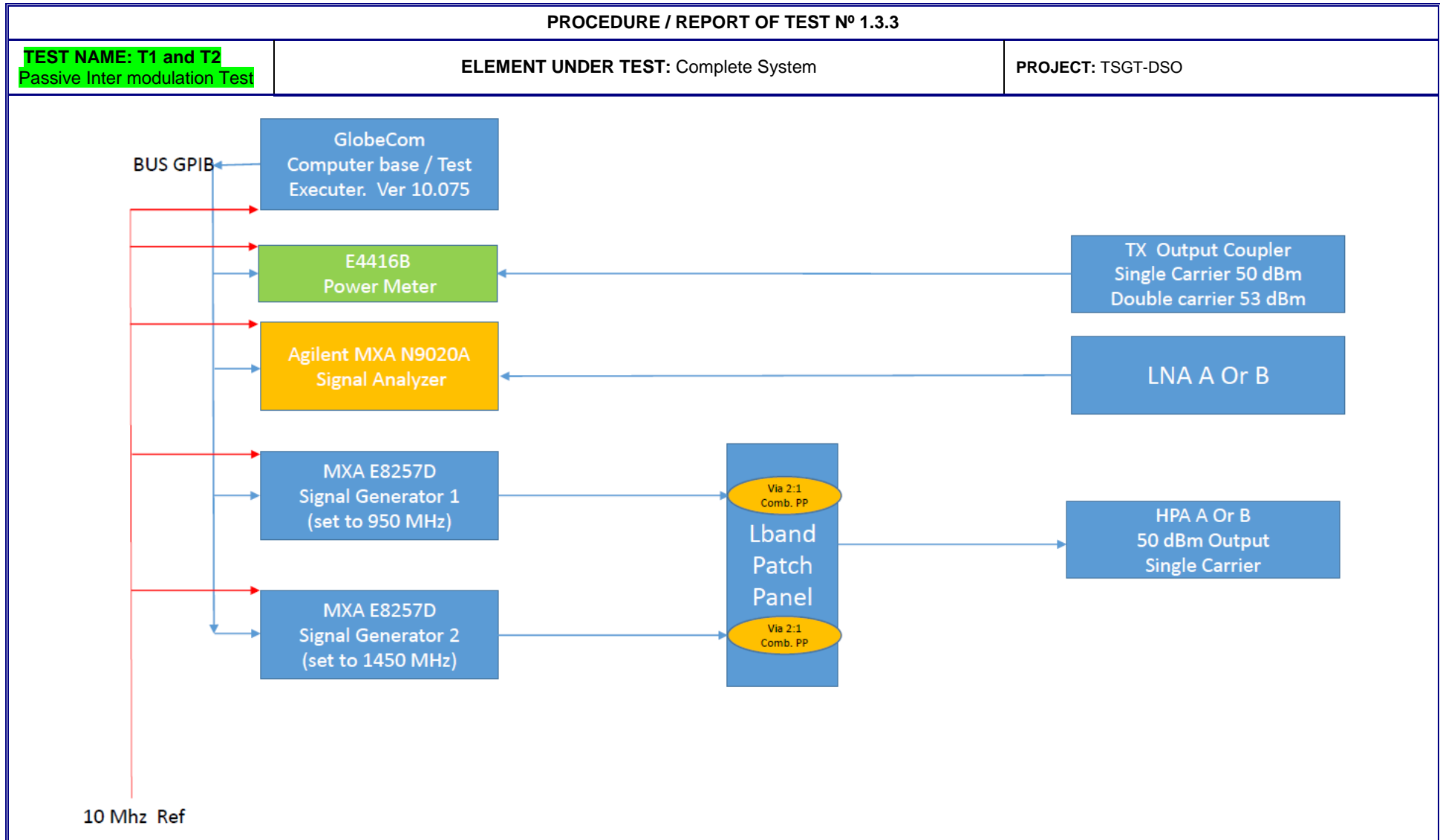
PROCEDURE / REPORT OF TEST Nº 1.3.3				
TEST NAME: TX to RX Isolation and TX inter-modulation falling in the RX band Test		ELEMENT UNDER TEST: Reception Subsystem		PROJECT: TSGT-DSO
	<p>One FDMA Carrier</p> <p>Set BW = 512 Kbps. and check results</p> <p>Set BW = 2048 Kbps. and check results</p> <p>Set BW = 4096 Kbps. and check results</p> <p>Set BW = 8192 Kbps. and check results</p> <p>Switch LNA-B and</p> <p>Set BW = 512 Kbps. and check results</p> <p>Set BW = 2048 Kbps. and check results</p> <p>Set BW = 4096 Kbps. and check results</p> <p>Set BW = 8192 Kbps. and check results</p>		<p>_____ dBm.</p> <p>_____ dBm.</p> <p>_____ dBm.</p> <p>_____ dBm.</p> <p>_____ dBm.</p> <p>_____ dBm.</p> <p>_____ dBm.</p> <p>_____ dBm.</p>	
10.	<p>Two Simultaneous Carriers</p> <p>Set BW at 2 FDMA carriers at 2048 Kbps and check results</p> <p>Switch LNA-B and</p> <p>Set BW at 2 FDMA carriers at 2048 Kbps and check results</p>	<p>Check that the noise floor does not change by more than 0.5 dB when RF is switched ON and OFF.</p>	<p>_____ dBm.</p> <p>_____ dBm.</p>	
11.	<p>Four Simultaneous Carriers</p> <p>Set BW at 4 FDMA carriers at 2048 Mbps and check results</p> <p>Switch LNA-B and</p> <p>Set BW at 4 FDMA carriers at 2048 Mbps and check results</p>	<p>Check that the noise floor does not change by more than 0.5 dB when RF is switched ON and OFF.</p>	<p>_____ dBm.</p> <p>_____ dBm.</p>	
12.	<p>Four Simultaneous Carriers</p>	<p>Check that the noise floor does not change by more</p>	<p>_____ dBm.</p>	

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PROCEDURE / REPORT OF TEST N° 1.3.3				
TEST NAME: TX to RX Isolation and TX inter-modulation falling in the RX band Test	ELEMENT UNDER TEST: Reception Subsystem			PROJECT: TSGT-DSO
	Set BW at 2 FDMA carriers at 2048 Mbps Set BW at 2 EPM carriers at CW / modulated and check results Switch LNA-B and Set BW at 2 FDMA carriers at 2048 Mbps Set BW at 2 EPM carriers at CW / modulated and check results		than 0.5 dB when RF is switched ON and OFF.	_____dBm.

1.3.3.2 T1 & T2 PASSIVE INTERMODULATION TEST (PIM)

PROCEDURE / REPORT OF TEST N° 1.3.3				
TEST NAME: T1 and T2 Passive Inter modulation Test	ELEMENT UNDER TEST: Complete System			PROJECT: TSGT-DSO
STEP	TEST SEQUENCE	EXPECTED RESULT	RESULT	REMARKS



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PROCEDURE / REPORT OF TEST N° 1.3.3										
TEST NAME: T1 and T2 Passive Inter modulation Test		ELEMENT UNDER TEST: Complete System						PROJECT: TSGT-DSO		
1.	<p>Configure Test setup as indicated in test procedure Passive Inter Modulation (PIM) test</p> <p>Connect combined Signal generators output to the L-BAND patch panel respective antenna input EBEM 1 T1 under test and reach TX power level 50 dBm output for single carrier for double carrier 53 dBm.</p> <p>Connect Spectrum Analyser to output of LNA A or B and record the results on the table below.</p>									
2.	3rd Order Intermodulation Products(IM3)									
	F1 RF MHz	F1 RF MHz	IM3	LNA Gain	Cable loss	Xfer Gain	Measured dBm	Calculated dBm	Spec Max dBm	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
	7900	8050	7750						-135.00	
	7900	8100	7700						-135.00	
	7900	8200	7600						-135.00	
	7900	8300	7500						-135.00	
7900	8400	7400						-135.00		
3.	3rd Order Intermodulation Products(IM5)									
	F1 RF MHz	F1 RF MHz	IM5	LNA Gain	Cable loss	Xfer Gain	Measured dBm	Calculated dBm	Spec Max dBm	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
	7900	8050	7600						-135.00	
	7900	8100	7500						-135.00	
7900	8200	7300						-135.00		
4.	7th Order Intermodulation Products(IM7)									
	F1 RF MHz	F1 RF MHz	IM7	LNA Gain	Cable loss	Xfer Gain	Measured dBm	Calculated dBm	Spec Max dBm	<input type="checkbox"/> Passed <input type="checkbox"/> Failed

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PROCEDURE / REPORT OF TEST N° 1.3.3										
TEST NAME: T1 and T2 Passive Inter modulation Test			ELEMENT UNDER TEST: Complete System						PROJECT: TSGT-DSO	
	7900	8050	7450						-135.00	
	7900	8100	7300						-135.00	
5.	Worst Case 3 rd order Product level in dBm							dBm	
6.	Average 3 rd order Product level in dBm							dBm	
7.	<p>Configure Test setup as indicated in test procedure Passive Inter Modulation (PIM) test"</p> <p>Connect combined Signal generators output to the L-BAND patch panel respective antenna input EBEM 1 T2 under test and reach TX power level 50 dBm output for single carrier for double carrier 53 dBm.</p> <p>Connect Spectrum Analyser to output of LNA A or B and record the results on the table below.</p>									
8.	3rd Order Intermodulation Products(IM3)									
	F1 RF MHz	F1 RF MHz	IM3	LNA Gain	Cable loss	Xfer Gain	Measured dBm	Calculated dBm	Spec Max dBm	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
	7900	8050	7750						-135.00	
	7900	8100	7700						-135.00	
	7900	8200	7600						-135.00	
	7900	8300	7500						-135.00	
7900	8400	7400						-135.00		
9.	3rd Order Intermodulation Products(IM5)									
	F1 RF MHz	F1 RF MHz	IM5	LNA Gain	Cable loss	Xfer Gain	Measured dBm	Calculated dBm	Spec Max dBm	<input type="checkbox"/> Passed <input type="checkbox"/> Failed

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PROCEDURE / REPORT OF TEST Nº 1.3.3											
TEST NAME: T1 and T2 Passive Inter modulation Test			ELEMENT UNDER TEST: Complete System							PROJECT: TSGT-DSO	
	7900	8050	7600							-135.00	
	7900	8100	7500							-135.00	
	7900	8200	7300							-135.00	
10.	7th Order Intermodulation Products(IM7)										
	F1 RF MHz	F1 RF MHz	IM7	LNA Gain	Cable loss	Xfer Gain	Measured dBm	Calculated dBm	Spec Max dBm	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
	7900	8050	7450						-135.00		
	7900	8100	7300						-135.00		
11.	Worst Case 3 rd order Product level in dBm								dBm	
12.	Average 3 rd order Product level in dBm								dBm	

1.5 ANTENNA POSITIONING SUBSYSTEM TEST

1.5.1 T2- ACU and ANTENNA DRIVE SYSTEM Test Procedure

PROCEDURE / REPORT OF TEST Nº 1.5.1				
TEST NAME: T2 Antenna Operational checks	ELEMENT UNDER TEST: Antenna Subsystem		PROJECT: TSGT-DSO	
STEP	TEST SEQUENCE	EXPECTED RESULT	RESULT	REMARKS
	Configure antenna operation and settings according to reference procedure 600-1219 Rev B 2_4m O-M MANUAL and NCIA CSSC EMB TSS PMI procedures.			
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>TSGT G3 T2</p> <p>Up Hardware Limit 85 Up Software Limit 80 Deploy 10 Down Software Limit 5 Down Hardware Limit 0 Stow HW SW Velocity EL -72(2.5 Inc) Stow CMD EL/AZ -79(281)/0</p> </div> <div style="text-align: center;"> <p>TSGT G3 T1</p> <p>Up Hardware Limit 82 Up Hardware Limit 81 (EI Motor) Up Software Limit 80 Deploy 22.5 Down Software Limit 10 Down Hardware Limit 6.5 (EI Motor) Stow HW SW Stow Bar raise -45 Stow HW SW Velocity EL -55/0 Stow CMD EL/AZ -58(300)/0</p> </div> </div>				

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PROCEDURE / REPORT OF TEST N° 1.5.1				
TEST NAME: T2 Antenna Operational checks	ELEMENT UNDER TEST: Antenna Subsystem			PROJECT: TSGT-DSO
1.	Check The Power Drive Unit is mechanically ruggedized. Power on PDU		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
2.	Power On ACU and configure for T2 operation. Capture print screen of ACU on ASNMC GUI.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

ACU T2 [Connected]

ACU T2	Summary Fault: Normal	Fundamental mode: Rate	Current Target
	New Fault: Normal	Submode: Off target	Azimuth (°) 131.67 131.67
		Last cmd status: 	Elevation (°) 27.61 27.61
		Signal level (dBm): -62.73	<input type="button" value="StandBy"/>
			<input type="button" value="Clear last status"/>

Manual | Beacon | Tracking | Station infos | Alarms | NORAD setup | Quick start | Satellite

Az drive fault Normal	EL + software limit Normal	Premature stow Normal	CP task error Normal
Az HCRNK engaged Normal	EL - software limit Normal	Stowed off target Normal	Keypad task error Normal
Az CW prelimit Normal	Magnetic DISTORT Normal	El vel. limit error Normal	Status task error Normal
Az CCW prelimit Normal	Inclinometer ERR Normal	Incomplete stow Normal	OpTrack task error Normal
Az brake fault Normal	Magnometer Error Normal	Power supply fail Normal	Tracking task error Normal
Az stow aligned No	Low signal Normal	Battery test fail Normal	Console di error Normal
El drive fault Normal	MemTrack available No	Real time clk error Normal	Sim task error Normal
El HCRNK engaged Normal	ACU-PDU link down Normal	Real time clk stck Normal	AZ CW Limit Normal
El up prelimit Normal	ACU-COMPTR link down Normal	Xco timer error Normal	AZ CCW Limit Normal
El down prelimit Normal	ACU-PDU link reset Normal	PED Select Invalid Normal	ANT Connect Fail Normal
El brake fault Normal	Antenna stowed No	Check PED Jumper Normal	EL Up Limit Normal
El velocity limit No	Rcvr 1 link down Normal	Restore Invalid Normal	EL Down Limit Normal
ACU Emergency stop Normal	Obj. below El trav. Normal	Track Overspeed Normal	ANT Safe INTLK Normal
Ant. Emergency stop Normal	Target below horizon Normal	MemTrack table error Normal	SIM ON - ACU Normal
Horn active No	Tracking low signal lev. Normal	Unacquirable signal Normal	Feedback Range ERR Normal
Axis difference Normal	Bad track data pnt. Normal	RCVR 1 fault Normal	TCM2 EPROM Error Normal
Serial port fault Normal	High signal Normal	GPS data unavailable Normal	Transmit Limit Normal
Digital port fault Normal	Load site localization Normal	ACU-GPS link down Normal	POS Loop Test On Normal
DAC ADC fault Normal	Band conflict Normal	Compass link down Normal	FREQ In Multibanks Normal
Cmnd > Region Az+ Normal	Command > Region Normal	SIG process error Normal	MemTrack data err Normal
Cmnd > Region Az- Normal	ACU software error Normal	MemTrack task error Normal	Optrack POL ERR Normal
Cmnd > Region El+ Normal	Execute standby mode Normal	Console task error Normal	No Feed Detected Normal
Cmnd > Region El- Normal	OpTrack Tbl Err. Normal	CLI task error Normal	RCVR 1 Link Down Normal
Az+ software limit Normal	OpTrack data Err. Normal	Mode task error Normal	
Az- software limit Normal	Calibration fail Normal	Database task error Normal	

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PROCEDURE / REPORT OF TEST N° 1.5.1				
TEST NAME: T2 Antenna Operational checks	ELEMENT UNDER TEST: Antenna Subsystem		PROJECT: TSGT-DSO	
3.	Check ACU/PDU Link		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
4.	Check compass type and compass operation when SSPA's ON	True NORTH	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
5.	Activate DEPLOY Mode antenna and check Compass heading and compare read out against handheld Compass	Heading as required Deploy>10 deg.EL.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
6.	Make sure antenna is moving to 'DEPLOY' position and giving 'DEPLOYED' Message	Deployed @10 Deg. EL	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
7.	Verify the absence of the "ACU-GPS LINK DOWN" fault message in the Messages/Faults screen. Read and Write down the coordinates as shown in Setup/Calib screen Check that the "GPS DATA UNAVAIL" message appears on the Messages/Status screen. Wait until the message disappears. In this moment, the GPS receiver has acquired a valid site location. Check GPS Quality Read and Write down the coordinates as shown in Setup/Calib screen Check that the coordinates are correct	Long.: Lat.:	<input type="checkbox"/> Passed <input type="checkbox"/> Failed Long. E Lat.: N	
8.	Activate STOW Mode and check antenna stowing as required. And Check and record antenna STOW command	Elevation Stow command -77.0	Command:	
9.	Check antenna is center on AZ to 0 degree and fitting into the frame, Check AZ STOW Centre switch operation.	Check AZ center Offset =0 Check Centre Switch	Offset= <input type="checkbox"/> Passed <input type="checkbox"/> Failed	

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PROCEDURE / REPORT OF TEST N° 1.5.1				
TEST NAME: T2 Antenna Operational checks	ELEMENT UNDER TEST: Antenna Subsystem			PROJECT: TSGT-DSO
10.	Check antenna, slowing when antenna reaches 5-7cm to final stow position. If not, adjust the Switch located in the EL pedestal.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
11.	Check Antenna STOWED messages and actual STOW position	Elevation Stow actual value Stowed message	Actual Value: <input type="checkbox"/> Passed <input type="checkbox"/> Failed	
12.	Check Manual ACU/ Antenna JOG Commands		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
13.	Check Satellite Preset list availability for 6 satellites		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
14.	Activate at least 2 different satellite searches and make sure antenna-tracking system is finding satellites. Record test results to "Satellite track data table for T2" If cannot find satellites set proper Heading offset on the compass calibration and record the value	Heading Offset:	Heading Offset: (Mark Angle) <input type="checkbox"/> Passed <input type="checkbox"/> Failed	

SATELLITE NAME	Satellite Inclination	Track mode	S/S Antenna pointed	Input signal level	Observations
GOVSAT	0	optrack	<input type="checkbox"/> Passed <input type="checkbox"/> Failed		Offset -45/low sig thr -80 /Bw:4KHz
SKY 5B	0	optrack	<input type="checkbox"/> Passed <input type="checkbox"/> Failed		Offset -45/low sig thr -80 /Bw:4KHz
SKY 5C	0	optrack	<input type="checkbox"/> Passed <input type="checkbox"/> Failed		Offset -45/low sig thr -80 /Bw:4KHz
SKY 5D	0	optrack	<input type="checkbox"/> Passed <input type="checkbox"/> Failed		Offset -45/low sig thr -80 /Bw:4KHz
SCRALL1B	0	optrack	<input type="checkbox"/> Passed <input type="checkbox"/> Failed		Offset -45/low sig thr -80 /Bw:4KHz
SYRACUSE3A	0	optrack	<input type="checkbox"/> Passed <input type="checkbox"/> Failed		Offset -45/low sig thr -80 /Bw:280KHz

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PROCEDURE / REPORT OF TEST N° 1.5.1				
TEST NAME: T2 Antenna Operational checks	ELEMENT UNDER TEST: Antenna Subsystem		PROJECT: TSGT-DSO	
TABLE 1.5.1 "Satellite track data table for T2"				
15.	Set OP_TRACK Mode. Indicate the initialization conditions. Step-track Mode. Verify that the Terminal is pointing to the satellite in every case; Record Beacon signal level. Read the input signal level from ACU.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
16.	ACU Software Pre-limit set up and operation checks. Apply below checks Deploy the antenna, Record the AZ heading, calculate pre-limit, and command via MACS.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
17.	Antenna AZ axis in clockwise (CW) direction and check: Command, Heading + 144 degree and check antenna moving to commanded value. Command Heading + 145+1 degree and check <ul style="list-style-type: none"> The Antenna stops responding, "Command is out of range. Manually (by PMU) move antenna to reach command value, read, and record the value when alarms appears. Manually (by PMU) move antennas to reach CW limit Switch. 	AZ _{CW} = +145° (Heading 205)+145+1=351 AZ CW SW fault AZ limit CW HW fault	AZ HEADING = AZ CW SW= AZ CW HW=	
18.	Antenna AZ axis in counter clockwise (CCW) direction and check: Command Heading + (-144) degree and check antenna moving to commanded value. Command Heading + (-145+1) degree and check <ul style="list-style-type: none"> The Antenna stops responding, "Command is out of range. Manually (by PMU) move antenna to reach command value, read, and record the value when alarms appears. Manually (by PMU) move antennas to reach CCW limit Switch. 	AZ _{CCW} = -145° (Heading 205)-145-1=59 AZ CCW SW fault AZ limit CCW HW fault	AZ HEADING = AZ CCW SW= AZ CW HW=	

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PROCEDURE / REPORT OF TEST N° 1.5.1				
TEST NAME: T2 Antenna Operational checks	ELEMENT UNDER TEST: Antenna Subsystem	PROJECT: TSGT-DSO		
19.	Antenna EL DOWN axis check: Command antenna on the El-down axis to 6 ° degrees Command antenna on the El-down axis to 4 ° degree and check <ul style="list-style-type: none"> The Antenna stops responding, “Command is out of range.” Manually (by PMU) move antenna to reach command value, read, and record the value when alarms appears. Manually (by PMU) move antenna to reach down limit Switch. 	EL _{DOWN} = 5° EL DWN SW limit fault EL DWN HW limit fault	EL _{DOWN} = SW=5 HW=	
20.	Antenna EL UP axis check: Command antenna on the El-down axis to 79 ° degrees Command antenna on the El-down axis to 81 ° degree and check <ul style="list-style-type: none"> The Antenna stops responding, “Command is out of range.” Manually (by PMU) move antenna to reach command value, read, and record the value when alarms appears. Manually (by PMU) move antennas to reach UP limit switch. 	EL UP =80° Command exceed EL UP+ EL UP SW limit fault EL UP HW limit fault	EL _{UP} = SW= HW=	
21.	Apply Wind Up Test: 1. Place the antenna pointed at a stationary satellite. 2. Manually peak the signal. 3. Execute the Windup test. 4. Run the Windup test three times and verify that the results are similar for all runs. 5. Log Test result Typical Windup values should be less than 1% of the 3 dB beamwidth Beamwidth: $\frac{21}{freq \times dia}$ (Freq in GHz, Diameter in meters)	@ 7.405GHz: T2: 1.18° 1% of BW T2: 0.0118°	T2 Test #1: Az: 0.007 El : 0.005 T2 Test #2: Az: 0.007 El : 0.015 T2 Test #3: Az: 0.009 El : 0.004	

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PROCEDURE / REPORT OF TEST N° 1.5.1				
TEST NAME: T2 Antenna Operational checks	ELEMENT UNDER TEST: Antenna Subsystem			PROJECT: TSGT-DSO
			<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
22.	Check antenna Feed Membrane and Air leakage	Less than 2% on dehydrator	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
23.	Check Elevation Steel Cables tension on the right-Hand side Not more than 1.00 +0.32" (2.6 cm) (factory setup)	(2.6 cm) (factory setup)	Cable #1 Cable #2 Cable #3 Cable #4 Cable #5 Cable #6	
24.	Check Elevation Steel Cables tension and on the Left Hand side	(2.6 cm) (factory setup)	Cable #1 Cable #2 Cable #3 Cable #4 Cable #5 Cable #6	
25.	Check Azimuth Steel Cables tension	(2.6 cm) (factory setup)	Cable #1... Cable #2 ... Cable #3..... Cable #4.....	
26.	Check Azimuth and El gear boxes.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
27.	Apply Elevation Hand Crank operation		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

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PROCEDURE / REPORT OF TEST N° 1.5.1				
TEST NAME: T2 Antenna Operational checks		ELEMENT UNDER TEST: Antenna Subsystem		PROJECT: TSGT-DSO
28.	Apply Azimuth Hand Crank operation		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
29.	Apply Azimuth bearing operation		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
30.	Check all cable harness, Feed boom struts, Feed pallet struts, Ferrous metal surfaces Painting, cracks and rusting Waveguide connections and support brackets		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
31.	Apply recommended rust preventive re-coating on Ferrous parts and clean the dust and excessive oil		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
32.	Apply De-icing system and blister check procedure		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

1.5.2 T1 ACU and ANTENNA DRIVE SYSTEM Test Procedure

PROCEDURE / REPORT OF TEST N° 1.5.2				
TEST NAME: T1 Calibration		ELEMENT UNDER TEST: Antenna Subsystem		PROJECT: TSGT-DSO
STEP	TEST SEQUENCE	EXPECTED RESULT	RESULT	REMARKS
	Perform PMI I.A.W. procedure 600-1246C4 OPERATION & MAINTENANCE MANUAL FOR 46M TSGT Note That Limits are updated I.A.W. specific requirements			

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PROCEDURE / REPORT OF TEST N° 1.5.2				
	TEST NAME: T1 Calibration	ELEMENT UNDER TEST: Antenna Subsystem	PROJECT: TSGT-DSO	
1.	Check T1 antenna for wear and tear, corrosion and painting removal available		<input type="checkbox"/> Passed	<input type="checkbox"/> Failed
2.	Check Transport support X ties and ropes tying reflector		<input type="checkbox"/> Passed	<input type="checkbox"/> Failed
3.	Check Trailer Brakes and operation.		<input type="checkbox"/> Passed	<input type="checkbox"/> Failed
4.	Check Air Suspension valve system and Air cushions operation.		<input type="checkbox"/> Passed	<input type="checkbox"/> Failed
5.	Check Signal lamps and Transport electrical devices on road operation.		<input type="checkbox"/> Passed	<input type="checkbox"/> Failed
6.	Check that Trailer feet and supporters' pins are in place and working properly.		<input type="checkbox"/> Passed	<input type="checkbox"/> Failed
7	Check Antenna reflector EL Transport support bar and switch operation and lubrication.		<input type="checkbox"/> Passed	<input type="checkbox"/> Failed
8	Check EL Motor Transport support bar and switch operation.		<input type="checkbox"/> Passed	<input type="checkbox"/> Failed
9	Check antenna feed locking pins and pads are in good condition.		<input type="checkbox"/> Passed	<input type="checkbox"/> Failed
10	Check feed Assembly is in good condition after deploy the antenna		<input type="checkbox"/> Passed	<input type="checkbox"/> Failed
11.	Check antenna feed is placing on stow brackets properly.		<input type="checkbox"/> Passed	<input type="checkbox"/> Failed
12.	Check antenna Stow Support Unit is in good condition pins and joints are maintained, safe and lubricated properly. Switch is functional and locking mechanism working properly. Check in the "limit switch logic box" STOW BRACKET Led light is OFF when switch actuated		<input type="checkbox"/> Passed	<input type="checkbox"/> Failed

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PROCEDURE / REPORT OF TEST N° 1.5.2				
TEST NAME: T1 Calibration	ELEMENT UNDER TEST: Antenna Subsystem		PROJECT: TSGT-DSO	
13.	Check Antenna STOW Support Unit Velocity Switch, pads and spring are in good condition and working properly.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
14.	Check Antenna Feed Waveguide Assembly connections are in good condition, tight and free of corrosion.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
15.	Check antenna motors/brakes and lubrication and perform cleaning and lubrication for free operation I.A.W procedure, Lubrication and maintenance_T1_antenna		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
16.	Check That, Power Drive Unit is mechanically rugged. Power on PDU		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
17.	Power On ACU and configure for T1 operation. Capture print screen of ACU on ASNMC GUI.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
18.	Check ACU/PDU Link		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
19.	Activate DEPLOY Mode antenna and check Compass heading and compare read out with handheld Compass		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
20.	Make sure antenna is moving to deploy position and giving 'deployed' Message	Deployed (@22.5)	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
21.	Engage "HANDLE LATCH" Check in the "limit switch logic box "HANDLE LATCH" Led light is OFF when switch actuated		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
22.	DEPLOY Antenna Wings		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

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PROCEDURE / REPORT OF TEST N° 1.5.2				
TEST NAME: T1 Calibration	ELEMENT UNDER TEST: Antenna Subsystem		PROJECT: TSGT-DSO	
	<p>Check in the "limit switch logic box " L WING DEPLOYED Led light is OFF when switch actuated</p> <p>Check in the "limit switch logic box " R WING DEPLOYED Led light is OFF when switch actuated</p>			
23.	Check compass type and compass operation/activate Calibration after deploy	TRUENORTH/ calibrate	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
24.	<p>Verify the absence of the "ACU-GPS LINK DOWN" fault message in the Messages/Faults screen.</p> <p>Read and Write down the coordinates as shown in Setup/Calibration screen</p> <p>Check that the "GPS DATA UNAVAIL" message appears on the Messages/Status screen. Wait until the message disappears. In this moment, the GPS receiver has acquired a valid site location.</p> <p>Check GPS Quality</p> <p>Read and Write down the coordinates as shown in Setup/Calibration screen</p> <p>Check that the coordinates are correct</p>	<p>Brunssum</p> <p>Best:9</p> <p>Long.50.94E</p> <p>Lat.: 5.98N</p>	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	<p>Long.</p> <p>Lat.:</p>
25.	Activate STOW Mode and check antenna stowing as required. And Check and record antenna STOW command	Elevation Stow command -58	Command:	
26.	<p>Check antenna is center on AZ, properly to 0 degree and fitting into the frame, Check AZ STOW Centre switch operation.</p> <p>Check in the "limit switch logic box " AZ CENT Led light is OFF when switch actuated</p>	<p>Check AZ center Offset =0</p> <p>Check Centre Switch</p>	Offset= 0.0 <input type="checkbox"/> Passed <input type="checkbox"/> Failed	

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PROCEDURE / REPORT OF TEST N° 1.5.2				
TEST NAME: T1 Calibration	ELEMENT UNDER TEST: Antenna Subsystem		PROJECT: TSGT-DSO	
27.	<p>STOW Antenna Wings</p> <p>Check in the "limit switch logic box " L WING STOWED' Led light is OFF when switch actuated</p> <p>Check in the "limit switch logic box " R WING STOWED" Led light is OFF when switch actuated</p>		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
28.	<p>Check antenna Stow Velocity switch speed Slowdown activation and stops Antenna Elevation Drive and unit creates STOWED message.</p> <p>Check in the "limit switch logic box " EL VELOCITY" Led light is OFF when switch actuated</p>	Slow down velocity with activation of switch	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
29.	<p>Check Antenna STOWED messages and actual STOW position</p> <p>Check in the "limit switch logic box " STOWED" Led light is OFF when switch actuated</p>	Elevation Stow actual value Stowed message	Actual Value: <input type="checkbox"/> Passed <input type="checkbox"/> Failed	
30.	Activate Emergency STOW mode with Wings open	HW Bypass ON	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
	<p>Apply Manual AZ HAND CRANKING</p> <p>Check in the "limit switch logic box " AZ HANDCRANK" Led light is OFF when switch actuated</p>		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
	<p>Apply Manual EL HAND CRANKING</p> <p>Check in the "limit switch logic box " EL HANDCRANK" Led light is OFF when switch actuated</p>		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
31.	Check Manual ACU/ Antenna JOG Commands		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
32.	Check Satellite Preset list availability for 6 satellites		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

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PROCEDURE / REPORT OF TEST Nº 1.5.2					
TEST NAME: T1 Calibration	ELEMENT UNDER TEST: Antenna Subsystem			PROJECT: TSGT-DSO	
33.	Activate at least 2 different satellite searches and make sure antenna-tracking system is finding satellites. If cannot find satellites set proper Heading offset on the compass calibration and record the value and records test results to "Satellite track data table for T1"	Heading Offset:		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
34.	Set Op-track Mode. Indicate the initialization conditions. Step-track Mode. Verify that the Terminal is pointing to the satellite in every case. Record the signal level. Read the input signal level from ACU.			<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

SATELLITE NAME	Satellite Inclination	Track mode	S/S Antenna pointed	Input signal level	Observations
GOVSAT	0	optrack	<input type="checkbox"/> Passed <input type="checkbox"/> Failed		Offset -45/low sig thr -80 /Bw:4Khz
SKY 5B	0	optrack	<input type="checkbox"/> Passed <input type="checkbox"/> Failed		Offset -45/low sig thr -80 /Bw:4Khz
SKY 5C	0	optrack	<input type="checkbox"/> Passed <input type="checkbox"/> Failed		Offset -45/low sig thr -80 /Bw:4Khz
SKY 5D	0	optrack	<input type="checkbox"/> Passed <input type="checkbox"/> Failed		Offset -45/low sig thr -80 /Bw:4Khz
SCRALL1B	0	optrack	<input type="checkbox"/> Passed <input type="checkbox"/> Failed		Offset -45/low sig thr -80 /Bw:4Khz
SYRACUSE3A	0	optrack	<input type="checkbox"/> Passed <input type="checkbox"/> Failed		Offset -45/low sig thr -80 /Bw:280Khz

"Satellite track data table for T1"

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PROCEDURE / REPORT OF TEST N° 1.5.2				
TEST NAME: T1 Calibration	ELEMENT UNDER TEST: Antenna Subsystem	PROJECT: TSGT-DSO		
35.	ACU Software Pre-limit set up and operation checks. Apply below checks Deploy the antenna, Record the AZ Heading, calculate pre-limit and command via MACS.		<input checked="" type="checkbox"/> Passed <input type="checkbox"/> Failed	
36.	Antenna AZ axis in clockwise (CW) direction and check: Command Heading + 64 degree and check antenna moving to commanded value. Command Heading + 65+1 degree and check <ul style="list-style-type: none"> The Antenna stops responding, "Command is out of range. Manually (by PMU) move antenna to reach command value, read, and record the value when alarms appears. Manually (by PMU) move antennas to reach CW limit Switch. Read and record the value when alarms appears. Check Hardware limit switch stops movement Check in the "limit switch logic box " AZ CW " Led light is OFF when switch actuated	AZ _{CW} = (Heading 190)+64+1=258 AZ CW SW fault AZ limit CW HW fault	AZ _{HEADING} = AZ CW SW= AZ CW HW=	
36	Antenna AZ axis in counter clockwise (CCW) direction and check: Command Heading + (-64) degree and check antenna moving to commanded value. Command Heading + (-65+1) degree and check <ul style="list-style-type: none"> The Antenna stops responding, "Command is out of range. Manually (by PMU) move antenna to reach command value, read, and record the value when alarms appears. Manually (by PMU) move antennas to reach CCW limit Switch. Read and record the value when alarms appears. Check Hardware limit switch stops movement	AZ _{CCW} = (Heading 190)+64+1=125 AZ CCW SW fault AZ limit CCW HW fault	AZ _{HEADING} = AZ CCW SW= AZ CW HW=	

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PROCEDURE / REPORT OF TEST N° 1.5.2				
TEST NAME: T1 Calibration	ELEMENT UNDER TEST: Antenna Subsystem		PROJECT: TSGT-DSO	
	Check in the "limit switch logic box " AZ CCW" Led light is OFF when switch actuated			
37	<p>Antenna EL DOWN axis check:</p> <p>Command antenna on the EI-down axis to 11 ° degrees</p> <p>Command antenna on the EI-down axis to 9 ° degree and check</p> <ul style="list-style-type: none"> The Antenna stops responding, "Command is out of range. Manually (by PMU) move antenna to reach command value, read, and record the value when alarms appears. <p>Manually (by PMU) move antenna to reach EL DOWN limit Switch. Read and record the value when alarms appears. Check Hardware limit switch stops movement</p> <p>Check in the "limit switch logic box " ELDOWN" Led light is OFF when switch actuated</p>	<p>ELDOWN = 10</p> <p>EL DWN SW limit fault</p> <p>EL DWN HW limit fault</p>	<p>ELDOWN =</p> <p>SW=</p> <p>HW=</p>	
38	<p>Antenna EL UP axis check:</p> <p>Command antenna on the EI-down axis to 78 ° degrees</p> <p>Command antenna on the EI-down axis to 80 ° degree and check</p> <ul style="list-style-type: none"> The Antenna stops responding, "Command is out of range. Manually (by PMU) move antenna to reach command value, read, and record the value when alarms appears. Manually (by PMU) move antenna to reach EL UP limit Switch. Read and record the value when an alarm appears. Check Hardware limits switches stops movement Check in the "limit switch logic box " EL UP" Led light is OFF when switch actuated Check in the "limit switch logic box " EL UP-BACKUP" Led light is OFF when switch actuated 	<p>EL UP =80°</p> <p>Command exceed EL UP+</p> <p>EL UP SW limit fault</p> <p>EL UP HW limit fault</p>	<p>ELUP=</p> <p>SW=</p> <p>HW=</p> <p>FINALHW:</p>	

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PROCEDURE / REPORT OF TEST N° 1.5.2				
	TEST NAME: T1 Calibration	ELEMENT UNDER TEST: Antenna Subsystem	PROJECT: TSGT-DSO	
39	<ul style="list-style-type: none"> Lubricate EL Drive Shaft and check motor operations without any Noise 		<input type="checkbox"/> Passed	<input type="checkbox"/> Failed
40	<ul style="list-style-type: none"> Lubricate AZ Drive Sector and check motor operations without any Noise 		<input type="checkbox"/> Passed	<input type="checkbox"/> Failed
41	<ul style="list-style-type: none"> Open, clean and Check AZ Brake and clutch system functioning properly 		<input type="checkbox"/> Passed	<input type="checkbox"/> Failed
42.	<p>Apply Wind Up Test:</p> <ol style="list-style-type: none"> Place the antenna pointed at a stationary satellite. Manually peak the signal. Execute the Windup test. Run the Windup test three times and verify that the results are similar for all runs. Log Test result <p>Typical Windup values should be less than 1% of the 3 dB beamwidth</p> <p>Beamwidth: $\frac{21}{freq \times dia}$ (Freq in GHz, Diameter in meters)</p>	<p>@ 7.405GHz:</p> <p>T1: 0.62°</p> <p>1% of BW</p> <p>T1: 0.0062°</p>	<p>T1 Test #1: Az: 0.007 El : 0.005</p> <p>T1 Test #2: Az: 0.007 El : 0.015</p> <p>T1 Test #3: Az: 0.009 El : 0.004</p>	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
43.	Check antenna Feed Membrane and Air leakage		<input type="checkbox"/> Passed	<input type="checkbox"/> Failed
44.	<p>Apply De-icing system and blister check procedure</p> <p>Only one SSPA (T-2) and one TWTA Beam (T-1) can be turn ON when antenna Anti-Icing is enable.</p> <p>Only one ECU can be in operation when Antenna Anti-Icing is enable.</p>		<input type="checkbox"/> Passed	<input type="checkbox"/> Failed

1.5.3 T1 ANTENNA EMERGENCY STOP VERIFICATION

PROCEDURE / REPORT OF TEST N° 1.5.3				
TEST NAME: Emergency Stop verification		ELEMENT UNDER TEST: Antenna Subsystem		PROJECT: TSGT-DSO
STEP	TEST SEQUENCE	EXPECTED RESULT	RESULT	REMARKS
1.	Push the Antenna Emergency Power Stop button. Verify that the antenna trailer is unpowered.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
2.	Power-on the TSGT and wait for the equipment to start-up. Move the antenna by means of the ACU front panel or MACS. Push the ACU Emergency Stop button and Verify that the Antenna does not move.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
3.	Check the Alarms in MACS		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
4.	Check functionality of "Safe to Rotate" button on T1		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

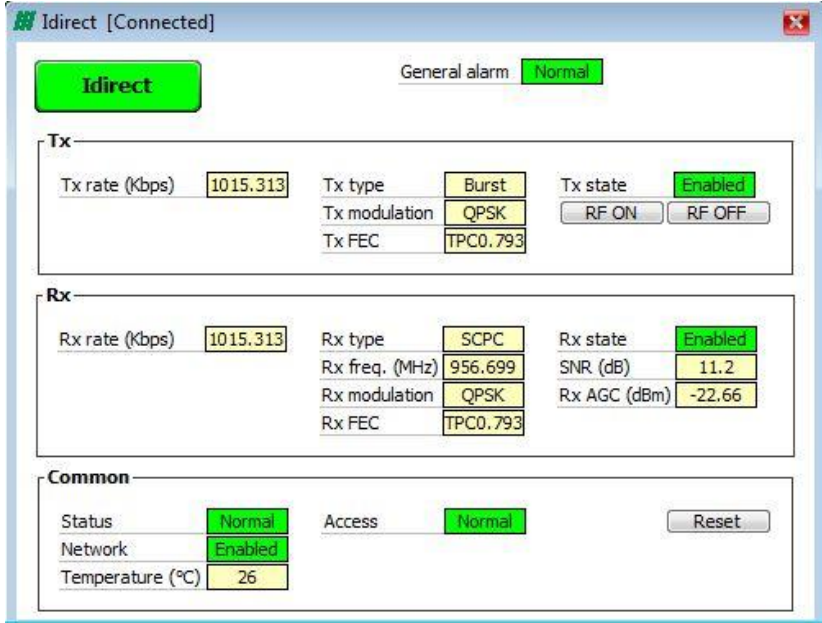
1.6 ASNMC FUNTIONALTY TEST

PROCEDURE / REPORT OF TEST N° 1.6.1				
TEST NAME: ASNMC		ELEMENT UNDER TEST: ASNMC		PROJECT: TSGT-DSO
STEP	TEST SEQUENCE	EXPECTED RESULT	RESULT	REMARKS
1.	ASNMC_Functionality_Test_Procedure Open Computer and check Fan operations clean inlet and outlets		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
2.	Check available Backup batteries and replace if needed		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

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PROCEDURE / REPORT OF TEST Nº 1.6.1				
TEST NAME: ASNMC	ELEMENT UNDER TEST: ASNMC		PROJECT: TSGT-DSO	
3.	Check ASNMC Computer is having latest version installed and functioning properly	Win7 prof. ASNMC Ver.1.2.2 Beta	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
4.	Check ASNMC Computer is having latest desktop NCIA BG Info logo installed and functioning properly		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
5.	Check the IP configuration recording to be sure the MACS has the proper IP address.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
6.	Check RDP (Remote Desk Top operation) Functioning properly		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
7.	Check SMS kit Installation perform and if Ports are configured.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
8.	Check iDirect EOW modem is reachable via ASNMC Computer. Download modem configuration to desktop and check modem is having latest operational option file loaded. (desired for dedicated Network)		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
9.	Configure EOW iDirect modem of the ASNMC or signal generator as follow; CW, CF 950 MHz, Output power -15 dBm.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
10.	Configure setup for T1, measure the CW signal at the TX Power out port of the T1 Antenna. CF 950 MHz CF 1200 MHz CF 1450 MHz	LBAND /XBAND -23.5dBm /33.0 dBm -23.5dBm /33.0 dBm -23.5dBm /33.0 dBm	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
11.	Configure setup for T2, measure on "RF TX OUT", apply measurements for /Read, and record the value measured. CF 950 MHz CF 1200 MHz	LBAND /XBAND -23.4dBm /38.0 dBm -23.4dBm /38.0 dBm -23.4dBm /38.0 dBm	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

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PROCEDURE / REPORT OF TEST N° 1.6.1				
TEST NAME: ASNMC	ELEMENT UNDER TEST: ASNMC		PROJECT: TSGT-DSO	
	CF 1450 MHz			
12.	<p>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 HPA's combined to antenna and wait till all LED's on the modem are steady green</p> <p>Capture print screen of IDirect on ASNMC GUI.</p>	Sync/ All LED's green	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
				
13.	<p>Logon to the LCA and start the ASNMC software.</p> <p>Double click on the NCCx_Access field and make sure that, in the resulting window, NCCA and NCCP access is available over ICC.</p> <p>Capture print screen of NCCx Access on ASNMC GUI.</p>		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

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PROCEDURE / REPORT OF TEST Nº 1.6.1				
TEST NAME: ASNMC		ELEMENT UNDER TEST: ASNMC		PROJECT: TSGT-DSO
16.	Establish connectivity between the ASNMC VPN router and connect the remote ASNMC computer to the dedicated port on the Remote port SW and perform a functionality test		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
17.	Establish connectivity between the ORION M&C switch and the remote M&C computer and perform a functionality test		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
18.	Log on to ASNMC DWS computer and check current ASNMC GUI version for Ver. ASNMC Ver.1.2.1	Win7 prof. ASNMC Ver.1.2.2 Beta	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
19.	Check ASNMC DWS Computer is having latest desktop NCIA BG.Info logo installed and functioning properly		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
20.	Log on VPN ROUTER/SWITCH and Check Configured Properly. Cooling Fans and Backup battery is keeping configuration.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

EMS TEST

1.7 EMS CW CARRIER TRANSMISSION

Test Procedure / REPORT OF TEST Nº 1.7.1				
TEST NAME: T-1 only EMS CW carrier transmission		ELEMENT UNDER TEST: EMS		PROJECT: TSGT-DSO
STEP	TEST SEQUENCE	EXPECTED RESULT	RESULT	REMARKS
1.	1.7.1_20150127_NU_EMS_Functionalty_Test_Procedure Open Computer and check Fan operations clean inlet and outlets		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
2.	Check available Backup batteries and replace if needed		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
3.	Check EMS Computer and VM is having latest Firmware/SW installed and communicating	V.02.01.12	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	.
4.	Check EMS 8U Modem Rack is having latest Firmware/SW installed and communicating Logging-on to LMC, launch LMS. > Display MR auto test.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
5.	Check EMU card is working Properly	Only 8U Modem Rack	<input checked="" type="checkbox"/> Passed <input type="checkbox"/> Failed	
6.	Check EMU Card Version is correct and upgraded to the latest.		<input checked="" type="checkbox"/> Passed <input type="checkbox"/> Failed	

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Test Procedure / REPORT OF TEST N° 1.7.1																				
TEST NAME: T-1 only EMS CW carrier transmission.		ELEMENT UNDER TEST: EMS		PROJECT: TSGT-DSO																
	<table border="1"> <thead> <tr> <th>Component</th> <th>Version</th> <th>Sub-component</th> <th>Version</th> </tr> </thead> <tbody> <tr> <td rowspan="5">EMU</td> <td rowspan="5">V9.6</td> <td>LIA</td> <td>V3.01</td> </tr> <tr> <td>BOOTPP</td> <td>V4.09</td> </tr> <tr> <td>TESTCAGE</td> <td>V5.28</td> </tr> <tr> <td>GESTCARMIN</td> <td>V1.15</td> </tr> <tr> <td>LCTL-EMU</td> <td>V9.6</td> </tr> </tbody> </table>	Component	Version	Sub-component	Version	EMU	V9.6	LIA	V3.01	BOOTPP	V4.09	TESTCAGE	V5.28	GESTCARMIN	V1.15	LCTL-EMU	V9.6			
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		BOOTPP	V4.09																	
		TESTCAGE	V5.28																	
		GESTCARMIN	V1.15																	
		LCTL-EMU	V9.6																	
7.	Check ECU card is working Properly	Only 8U Modem Rack	<input checked="" type="checkbox"/> Passed <input type="checkbox"/> Failed																	
8.	<p>Check ECU Card Version is correct and upgraded to the latest.</p> <table border="1"> <tbody> <tr> <td rowspan="2">ECU</td> <td rowspan="2">V1.1</td> <td>SMS</td> <td>V1.1</td> </tr> <tr> <td>STS</td> <td>V1.1</td> </tr> </tbody> </table>	ECU	V1.1	SMS	V1.1	STS	V1.1		<input checked="" type="checkbox"/> Passed <input type="checkbox"/> Failed											
ECU	V1.1			SMS	V1.1															
		STS	V1.1																	
9.	Check CU card #1 is working Properly	Only 8U Modem Rack	<input type="checkbox"/> Passed <input type="checkbox"/> Failed																	
10.	Check CU Card #1 Version is correct and upgraded to the latest.		<input checked="" type="checkbox"/> Passed <input type="checkbox"/> Failed																	

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Test Procedure / REPORT OF TEST N° 1.7.1																				
TEST NAME: T-1 only EMS CW carrier transmission.		ELEMENT UNDER TEST: EMS		PROJECT: TSGT-DSO																
	UC G2.0	Ed2 V3.04	<table border="1"> <tr><td>FPGATEST</td><td>01.01</td></tr> <tr><td>FPGAMFC2¹</td><td>02.10</td></tr> <tr><td>BOOTPP</td><td>05.03</td></tr> <tr><td>DSP_LPP</td><td>03.03</td></tr> <tr><td>DSP_NEMS²</td><td>03.23</td></tr> <tr><td>DSP_TEST</td><td>03.02</td></tr> <tr><td>LOG_OPE</td><td>12K20</td></tr> <tr><td>LIA</td><td>04.04</td></tr> </table>	FPGATEST	01.01	FPGAMFC2 ¹	02.10	BOOTPP	05.03	DSP_LPP	03.03	DSP_NEMS ²	03.23	DSP_TEST	03.02	LOG_OPE	12K20	LIA	04.04	
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DSP_NEMS ²	03.23																			
DSP_TEST	03.02																			
LOG_OPE	12K20																			
LIA	04.04																			
11.	Check CU card #2 is working Properly		Only 8U Modem Rack	<input type="checkbox"/> Passed <input type="checkbox"/> Failed																
12.	Check CU Card #2 Version is correct and upgraded to the latest.			<input checked="" type="checkbox"/> Passed <input type="checkbox"/> Failed																
	UC G2.0	Ed2 V3.04	<table border="1"> <tr><td>FPGATEST</td><td>01.01</td></tr> <tr><td>FPGAMFC2¹</td><td>02.10</td></tr> <tr><td>BOOTPP</td><td>05.03</td></tr> <tr><td>DSP_LPP</td><td>03.03</td></tr> <tr><td>DSP_NEMS²</td><td>03.23</td></tr> <tr><td>DSP_TEST</td><td>03.02</td></tr> <tr><td>LOG_OPE</td><td>12K20</td></tr> <tr><td>LIA</td><td>04.04</td></tr> </table>	FPGATEST	01.01	FPGAMFC2 ¹	02.10	BOOTPP	05.03	DSP_LPP	03.03	DSP_NEMS ²	03.23	DSP_TEST	03.02	LOG_OPE	12K20	LIA	04.04	
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DSP_TEST	03.02																			
LOG_OPE	12K20																			
LIA	04.04																			
13.	Check CU card #3 is working Properly		Only 8U Modem Rack	<input type="checkbox"/> Passed <input type="checkbox"/> Failed																
14.	Check CU Card #3 Version is correct and upgraded to the latest.			<input checked="" type="checkbox"/> Passed <input type="checkbox"/> Failed																

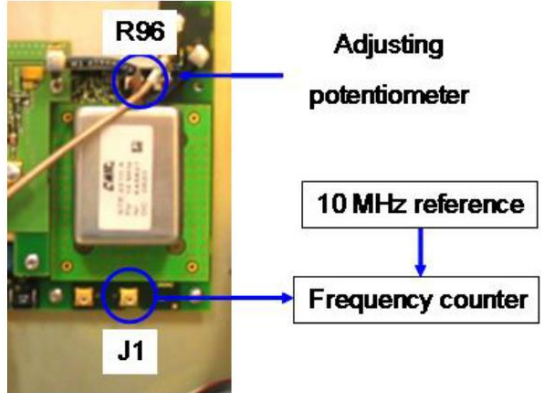
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Test Procedure / REPORT OF TEST N° 1.7.1							
TEST NAME: T-1 only EMS CW carrier transmission.			ELEMENT UNDER TEST: EMS			PROJECT: TSGT-DSO	
	UC G2.0	Ed2 V3.04	FPGATEST	01.01			
			FPGAMFC2 ¹	02.10			
			BOOTPP	05.03			
			DSP_LPP	03.03			
			DSP_NEMS ²	03.23			
			DSP_TEST	03.02			
			LOG_OPE	12K20			
			LIA	04.04			
15.	Check CU card #4 is working Properly				Only 8U Modem Rack	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
16.	Check CU Card #4 Version is correct and upgraded to the latest.					<input checked="" type="checkbox"/> Passed <input type="checkbox"/> Failed	
	UC G2.0	Ed2 V3.04	FPGATEST	01.01			
			FPGAMFC2 ¹	02.10			
			BOOTPP	05.03			
			DSP_LPP	03.03			
			DSP_NEMS ²	03.23			
			DSP_TEST	03.02			
			LOG_OPE	12K20			
			LIA	04.04			
17.	Check CU card #5 is working Properly				Only 8U Modem Rack	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

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Test Procedure / REPORT OF TEST N° 1.7.1					
TEST NAME: T-1 only EMS CW carrier transmission.		ELEMENT UNDER TEST: EMS		PROJECT: TSGT-DSO	
18	Check CU Card #5 Version is correct and upgraded to the latest.			<input checked="" type="checkbox"/> Passed <input type="checkbox"/> Failed	
	UC G2.0	Ed2 V3.04	FPGATEST		01.01
			FPGAMFC2 ¹		02.10
			BOOTPP		05.03
			DSP_LPP		03.03
			DSP_NEMS ²		03.23
			DSP_TEST		03.02
			LOG_OPE		12K20
LIA			04.04		
19.	Move one of the CU cards to slot #6 and Check CU card slot #6 is working Properly		Only 8U Modem Rack	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
20.	Check PSU #1 is working Properly		Only 8U Modem Rack	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
21.	Check PSU #2 is working Properly		Only 8U Modem Rack	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
22.	Check PSU #3 is working Properly		Only 8U Modem Rack	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
23.	Check PSU #4 is working Properly		Only 8U Modem Rack	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
24.	Check cooling fan Try fans are running Properly		Only 8U Modem Rack	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
25.	Replace ECU card back-up battery and Stick a battery replacement date label on the board.		Only 8U Modem Rack	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

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Test Procedure / REPORT OF TEST Nº 1.7.1				
TEST NAME: T-1 only EMS CW carrier transmission.		ELEMENT UNDER TEST: EMS		PROJECT: TSGT-DSO
26.	Apply 10 MHz reference calibration on 8U Modem Rack	Only 8U Modem Rack	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
<p>SET THE FREQUENCY COUNTER</p> <ul style="list-style-type: none"> ◆ Connect the frequency counter to the J1 connector (SMB connector). <div style="text-align: center;">  <p>The diagram shows a close-up of a green printed circuit board (PCB) for an EMS 8U Modem. At the top, a potentiometer labeled R96 is highlighted with a blue circle. A blue arrow points from the text 'Adjusting potentiometer' to R96. Below it, a white box labeled '10 MHz reference' has a blue arrow pointing down to R96. At the bottom, a connector labeled J1 is highlighted with a blue circle. A blue arrow points from the text 'Frequency counter' to J1. A white box labeled 'Frequency counter' has a blue arrow pointing down to J1.</p> </div> <p>EMS 8U MODEM</p>				
27.	<p>Select Up-converter A ONLINE and SSPA A + B ONLINE.</p> <p>Configure modem EPM, CU#1 as follow; CW, CF 1200 MHz, Output power -15dBm.</p> <p>Connect the power meter sensor to LBAND P/P EMS 1 and Enable CW and measure the level.</p> <p>Make a LBAND BNC loop from UPLINK to/DOWNLINK Patch Panel.</p> <p>Record the RX Power Level on the LMS as seen below.</p> <p>Connect the power sensor to X BAND RF test Panel and Enable CW and measure the level. (Coupler 57dbc)</p> <p>Record the measured value for CF 950 MHz -15dBm.</p> <p>Record the measured value for CF 1450 MHz -15dBm.</p>	<p>LBANDTX:-16.8dbm</p> <p>BAND RX:-17.5dbm</p> <p>X -BAND TX</p> <p>T1:+40.0dBm</p> <p>X- BAND TX</p> <p>T2:+46.0dBm</p>	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

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Test Procedure / REPORT OF TEST N° 1.7.1				
TEST NAME: T-1 only EMS CW carrier transmission.		ELEMENT UNDER TEST: EMS		PROJECT: TSGT-DSO
	Install TX, RX RF Chain for CUs.			
28.	<p>Select Up-converter A ONLINE and SSPA A + B ONLINE.</p> <p>Configure modem EPM, CU#2 as follow; CW, CF 1200 MHz, Output power -15dBm.</p> <p>Connect the power meter sensor to LBAND P/P EMS 2 and Enable CW and measure the level.</p> <p>Make a LBAND BNC loop from UPLINK to/DOWNLINK Patch Panel.</p> <p>Record the RX Power Level on the LMS as seen below.</p> <p>Connect the power sensor to X BAND RF test Panel and Enable CW and measure the level. (Coupler 57dbc)</p> <p>Record the measured value for CF 950 MHz -15dBm.</p> <p>Record the measured value for CF 1450 MHz -15dBm.</p>	<p>LBANDTX: -16.8dbm</p> <p>LBAND RX: -17.5dbm</p> <p>X -BAND TX T1: +40.0dBm</p> <p>X- BAND TX T2: +46.0dBm</p>	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
29.	<p>Select Up-converter A ONLINE and SSPA A + B ONLINE.</p> <p>Configure modem EPM, CU#3 as follow; CW, CF 1200 MHz, Output power -15dBm.</p> <p>Connect the power meter sensor to LBAND P/P EMS 3 and Enable CW and measure the level.</p> <p>Make a LBAND BNC loop from UPLINK to/DOWNLINK Patch Panel.</p> <p>Record the RX Power Level on the LMS as seen below.</p> <p>Connect the power sensor to X BAND RF test Panel and Enable CW and measure the level. (Coupler 57dbc)</p>	<p>LBANDTX: -16.8dbm</p> <p>LBAND RX: -17.5dbm</p> <p>X -BAND TX T1: +40.0dBm</p> <p>X- BAND TX T2: +46.0dBm</p>	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

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Test Procedure / REPORT OF TEST N° 1.7.1				
TEST NAME: T-1 only EMS CW carrier transmission.	ELEMENT UNDER TEST: EMS		PROJECT: TSGT-DSO	
	Record the measured value for CF 950 MHz -15dBm. Record the measured value for CF 1450 MHz -15dBm.			
30.	Select Up-converter A ONLINE and SSPA A + B ONLINE. Configure modem EPM, CU#4 as follow; CW, CF 1200 MHz, Output power -15dBm. Connect the power meter sensor to LBAND P/P EMS 4 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 -15dBm. Record the measured value for CF 1450 MHz -15dBm.	LBANDTX: -16.8dbm LBAND RX: -17.5dbm X -BAND TX T1: +40.0dBm X- BAND TX T2: +46.0dBm	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
31.	Select Up-converter A ONLINE and SSPA A + B ONLINE. NOTE THAT THIS CU CARD IS NOT WIRED TO IFL UP/DOWN LINK PTACH PANELS Configure modem EPM, CU#5 as follow; CW, CF 1200 MHz, Output power -15dBm. Connect the power meter sensor to LBAND P/P EMS 5 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)	LBANDTX: -16.8dbm LBAND RX: -17.5dbm X -BAND TX T1: +40.0dBm X- BAND TX T2: +46.0dBm	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

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Test Procedure / REPORT OF TEST Nº 1.7.1				
TEST NAME: T-1 only EMS CW carrier transmission.		ELEMENT UNDER TEST: EMS		PROJECT: TSGT-DSO
	Record the measured value for CF 950 MHz -15dBm. Record the measured value for CF 1450 MHz -15dBm.			
32.	Select Up-converter A ONLINE and SSPA A + B ONLINE. MOVE CU#5 to CU SLOT# 6 NOTE THAT THIS CU CARD IS NOT WIRED TO IFL UP/DOWN LINK PTACH PANELS Configure modem EPM, CU#5 as follow; CW, CF 1200 MHz, Output power -15dBm. Connect the power meter sensor to LBAND P/P EMS 5 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 -15dBm. Record the measured value for CF 1450 MHz -15dBm.	LBANDTX: -16.8dbm LBAND RX: -17.5dbm X -BAND TX T1: +40.0dBM X- BAND TX T2: +46.0dBM	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
	Establish a test configuration and apply online test.		<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
1.	Check EMSe 1U Modems 1 is having latest Firmware/SWS installed and communicating.	ETX upgrade to V4.3.23 Versión V1.2.3 with CU V.04.03	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

NATO UNCLASSIFIED

Test Procedure / REPORT OF TEST Nº 1.7.1							
TEST NAME: T-1 only EMS CW carrier transmission.			ELEMENT UNDER TEST: EMS			PROJECT: TSGT-DSO	
	Component	Version	Sub-component	Version			
	ETX	i3.4.23	FIP	V5.03			
	SOCIP21E		V4.3.23				
	Factory File		V6.3.NE.5				
UC G2.1	Ed2 V4.03	LIA	04.04				
		BOOTPP	05.03				
		DSP_TEST	04.11				
		DSP_LPP	04.13				
		FPGATEST	02.17				
		CALIB_UC ¹	03.03				
		DSP_NEMS ²	04.03				
		FPGAMFC ²³	02.10				
		F_4606E3 ⁴	60.05				
D_4606E3 ⁵	03.50						
	Ed3 V3.32	LOG_OPE	12K20				
2.	Check EMSe 1U Modems 2 is having latest Firmware/SWS installed and communicating				ETX upgrade to V4.3.23 Versión V1.2.3 with CU V.04.03ETX upgrade to V4.3.23	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

NATO UNCLASSIFIED

Test Procedure / REPORT OF TEST Nº 1.7.1							
TEST NAME: T-1 only EMS CW carrier transmission.			ELEMENT UNDER TEST: EMS			PROJECT: TSGT-DSO	
	Component	Version	Sub-component	Version			
	ETX	i3.4.23		FIP			
	SOCIP21E			V4.3.23			
	Factory File			V6.3.NE.5			
UC G2.1	Ed2 V4.03		LIA	04.04			
			BOOTPP	05.03			
			DSP_TEST	04.11			
			DSP_LPP	04.13			
			FPGATEST	02.17			
			CALIB_UC ¹	03.03			
			DSP_NEMS ²	04.03			
			FPGAMFC ³	02.10			
			F_4606E3 ⁴	60.05			
			D_4606E3 ⁵	03.50			
	Ed3 V3.32		LOG_OPE	12K20			
3.	Check EMSe 1U Modems 3 is having latest Firmware/SWS installed and communicating				ETX upgrade to V4.3.23 Versión V1.2.3 with CU V.04.03 Versión V1.2.3 with CU V.04.03	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

NATO UNCLASSIFIED

Test Procedure / REPORT OF TEST Nº 1.7.1							
TEST NAME: T-1 only EMS CW carrier transmission.			ELEMENT UNDER TEST: EMS			PROJECT: TSGT-DSO	
	Component	Version	Sub-component	Version			
	ETX	i3.4.23	FIP	V5.03			
	SOCIP21E		V4.3.23				
	Factory File		V6.3.NE.5				
UC G2.1	Ed2 V4.03	LIA	04.04				
		BOOTPP	05.03				
		DSP_TEST	04.11				
		DSP_LPP	04.13				
		FPGATEST	02.17				
		CALIB_UC ¹	03.03				
		DSP_NEMS ²	04.03				
		FPGAMFC ²³	02.10				
		F_4606E3 ⁴	60.05				
		D_4606E3 ⁵	03.50				
	Ed3 V3.32	LOG_OPE	12K20				
4.	Check EMSe 1U Modems 4 is having latest Firmware/SWS installed and communicating				ETX upgrade to V4.3.23 Versión V1.2.3 with CU V.04.03 ETX upgrade to V4.3.23	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

NATO UNCLASSIFIED

Test Procedure / REPORT OF TEST Nº 1.7.1

TEST NAME: T-1 only EMS CW carrier transmission.

ELEMENT UNDER TEST: EMS

PROJECT: TSGT-DSO

	Component	Version	Sub-component	Version			
	ETX	i3.4.23	FIP	V5.03			
	SOCIP21E		V4.3.23				
	Factory File		V6.3.NE.5				
UC G2.1	Ed2 V4.03	LIA	04.04				
		BOOTPP	05.03				
		DSP_TEST	04.11				
		DSP_LPP	04.13				
		FPGATEST	02.17				
		CALIB_UC ¹	03.03				
		DSP_NEMS ²	04.03				
		FPGAMFC ²³	02.10				
		F_4606E3 ⁴	60.05				
D_4606E3 ⁵	03.50						
	Ed3 V3.32	LOG_OPE	12K20				
Establish a test configuration and apply online test.						<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
1.	Check EMSe 1U Modems 1 is having latest Firmware/SWS installed and communicating.			Version V1.2.1 with ETX upgrade to V4.3.23			
2.	Check EMSe 1U Modems 2 is having latest Firmware/SWS installed and communicating			Version V1.2.1 with ETX upgrade to V4.3.23			
3.	Check EMSe 1U Modems 3 is having latest Firmware/SWS installed and communicating			Version V1.2.1 with ETX upgrade to V4.3.23			

NATO UNCLASSIFIED

Test Procedure / REPORT OF TEST N° 1.7.1				
TEST NAME: T-1 only EMS CW carrier transmission.		ELEMENT UNDER TEST: EMS		PROJECT: TSGT-DSO
4.	Check EMSe 1U Modems 4 is having latest Firmware/SWS installed and communicating	Version V1.2.1 with ETX upgrade to V4.3.23		
5.	Apply 10 MHz reference calibration on EMSe1U Modem#1 <ul style="list-style-type: none"> Connect Frequency Counter to the BNC port at the front panel of the EMSe. Disconnect 10 MHz supplied from NETCLOCK at the back of the EMSe. Internal Frequency should be 10 MHz, +/-10Hz on the Frequency Counter. If not, remove the + screw at the front of the EMSe and adjust it for 10 MHz 	10.000.000Hz. Level: +1.04dbm		
6.	Apply 10 MHz reference calibration on 1U Modem#2	10.000.000Hz. Level: +0.99dbm	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
7.	Apply 10 MHz reference calibration on 1U Modem#3	10.000.000Hz. Level: +0.89dbm	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
8.	Apply 10 MHz reference calibration on 1U Modem#4	10.000.000Hz. Level: +0.89dbm	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
9.	Select Up-converter A ONLINE and SSPA A + B ONLINE. Configure modem EPM, TU1, (EMSe #1) as follow; CW, CF 1200 MHz, Output power -15dBm. 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.	LBANDTX: -17.41dbm LBAND RX: -21.9dbm	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	EMSe1

NATO UNCLASSIFIED

Test Procedure / REPORT OF TEST N° 1.7.1			
TEST NAME: T-1 only EMS CW carrier transmission.	ELEMENT UNDER TEST: EMS	PROJECT: TSGT-DSO	
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 -15dBm. Record the measured value for CF 1450 MHz -15dBm. Install TX,RX RF Chain for CUs.	XBAND TX T2: +44.00dBm		

Available resources

- OLUX
 - P. Modems
 - TU 1
 - TU 2
 - RF Chains
 - RX RF Chains
 - RxLband-105-T2
 - TX RF Chains
 - TxLband-105-T2
 - Satellite: N/A
- OLUXT1
 - P. Modems
 - TU 3
 - RF Chains
 - RX RF Chains
 - RxLband-105-T1
 - TX RF Chains
 - TxLband-105-T1
 - Satellite: N/A

Terminal

OLUX Protected

OLUXT1 Protected

P. Modems

TU 1 OLUX

TU 2 OLUX

TU 3 OLUXT1

Links

LMS - Carrier wave mode on CU 1

Tx Power (dBm): -15 For 1U, range is [-30; 0]
For 8U, range is [-45; -5]

Tx Frequency (MHz): 1200 [Configure](#)

Rx Power (dBm, +/-5dBm): -21.9 [Quit](#)

Rx Frequency (MHz): 1200.000000

Links list

Links names	Primary Modem	Backup Modem	Status	Tx	Rx	Termi

Ready

EMCON CNX AdminLMC

NATO UNCLASSIFIED

Test Procedure / REPORT OF TEST N° 1.7.1				
TEST NAME: T-1 only EMS CW carrier transmission.		ELEMENT UNDER TEST: EMS		PROJECT: TSGT-DSO
10.	<p>Select Up-converter A ONLINE and SSPA A + B ONLINE.</p> <p>Configure modem EPM, TU2, (EMSe #2) as follow; CW, CF 1200 MHz, Output power -15dBm.</p> <p>Connect the power meter sensor to LBAND P/P EMSe2 and Enable CW and measure the level.</p> <p>Make a LBAND BNC loop from UPLINK to/DOWNLINK Patch Panel.</p> <p>Record the RX Power Level on the LMS as seen below.</p> <p>Connect the power sensor to X BAND RF test Panel and Enable CW and measure the level. (Coupler 57dbc)</p> <p>Record the measured value for CF 950 MHz -15dBm.</p> <p>Record the measured value for CF 1450 MHz -15dBm.</p> <p>Install TX,RX RF Chain for CUs.</p>	<p>LBANDTX: -17.50dbm</p> <p>LBAND RX: -23.2dbm</p> <p>X- BAND TX T2: +44.1dBm</p>	<p><input type="checkbox"/> Passed <input type="checkbox"/> Failed</p>	EMSe2

Test Procedure / REPORT OF TEST N° 1.7.1

TEST NAME: T-1 only EMS CW carrier transmission.

ELEMENT UNDER TEST: EMS

PROJECT: TSGT-DSO

The screenshot displays the LMS - Monitoring and control [OLUX] software interface. The interface is divided into several sections:

- Left Panel (Tree View):** Shows available resources including P. Modems (TU 1, TU 2, TU 3), RF Chains (RX and TX), and Modems (OLUX, OLUXT1). It also indicates Satellite: N/A.
- Terminal:** Displays status for OLUX and OLUXT1, both marked as "Protected".
- MR:** A large black area, likely for monitoring or recording.
- P. Modems:** Shows three modems (TU 1, TU 2, TU 3) with status indicators (green and red).
- Configuration Window (LMS - Carrier wave mode on CU 2):**
 - Tx Power (dBm): -15 (For 1U, range is [-30; 0]; For 8U, range is [-45; -5])
 - Tx Frequency (MHz): 1200
 - Rx Power (dBm, +/-5dBm): -23.2
 - Rx Frequency (MHz): 1200.000000
- Links list:** A table with columns: Links names, Primary Modem, Backup Modem, Status, Tx, Rx, Termi.

The status bar at the bottom shows "Ready" and "EMCON CNX AdminLMC".

NATO UNCLASSIFIED

Test Procedure / REPORT OF TEST N° 1.7.1				
TEST NAME: T-1 only EMS CW carrier transmission.		ELEMENT UNDER TEST: EMS		PROJECT: TSGT-DSO
11.	<p>Select Up-converter A ONLINE and SSPA A + B ONLINE.</p> <p>Configure modem EPM, TU3, (EMSe #3) as follow; CW, CF 1200 MHz, Output power -15dBm.</p> <p>Connect the power meter sensor to LBAND P/P EMSe1 and Enable CW and measure the level.</p> <p>Make a LBAND BNC loop from UPLINK to/DOWNLINK Patch Panel.</p> <p>Record the RX Power Level on the LMS as seen below.</p> <p>Connect the power sensor to X BAND RF test Panel and Enable CW and measure the level. (Coupler 57dbc)</p> <p>Record the measured value for CF 950 MHz -15dBm.</p> <p>Record the measured value for CF 1450 MHz -15dBm.</p> <p>Install TX,RX RF Chain for CUs.</p>	<p>LBANDTX: -17.40dbm</p> <p>LBAND RX: -22.2dbm</p> <p>X- BAND TX T2: +44.2dBm</p>	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	EMSe3

Terminal

OLUX Protected

OLUXT1 Protected

P. Modems

TU 1 OLUX

TU 2 OLUX

TU 3 OLUXT1

Links

LMS - Carrier wave mode on CU 3

Tx Power (dBm): -15 For 1U, range is [-30; 0]
For 8U, range is [-45; -5]

Tx Frequency (MHz): 1200 **Configure**

Rx Power (dBm, +/-5dBm): -22.2 **Quit**

Rx Frequency (MHz): 1200.000000

Links list

Links names	Primary Modem	Backup Modem	Status	Tx	Rx	Termi

Ready

EMCON AdminLMC

NATO UNCLASSIFIED

Test Procedure / REPORT OF TEST N° 1.7.1				
TEST NAME: T-1 only EMS CW carrier transmission.		ELEMENT UNDER TEST: EMS		PROJECT: TSGT-DSO
12.	<p>Select Up-converter A ONLINE and SSPA A + B ONLINE.</p> <p>Configure modem EPM, TU4, (EMSe #4) as follow; CW, CF 1200 MHz, Output power -15dBm.</p> <p>Connect the power meter sensor to LBAND P/P EMSe4 and Enable CW and measure the level.</p> <p>Make a LBAND BNC loop from UPLINK to/DOWNLINK Patch Panel.</p> <p>Record the RX Power Level on the LMS as seen below.</p> <p>Connect the power sensor to X BAND RF test Panel and Enable CW and measure the level. (Coupler 57dbc)</p> <p>Record the measured value for CF 950 MHz -15dBm.</p> <p>Record the measured value for CF 1450 MHz -15dBm.</p> <p>Install TX, RX RF Chain for CUs.</p>	<p>LBANDTX: -16.8dbm</p> <p>LBAND RX: -17.5dbm</p> <p>X- BAND TX T2: +44.0dBm</p>	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	EMSe4

1.8 BER STABILITY TEST PER ITU- G.821 STANDARD

PROCEDURE / REPORT OF TEST Nº 1.8.1				
TEST NAME: BER stability Test		ELEMENT UNDER TEST: Satellite System		PROJECT: TSGT-DSO
STEP	TEST SEQUENCE	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 T1 or T2 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.			
2.	Configure the EBEM1 I.A.W the SAA's. (SAT Loop) See Configuration below. Verify that TSGT, EBEM1 is lock.			
3	Configure BER TESTER in the MODEM, start the BER test and verify test is free of any errors. Inject 1 Error and see it.			

PROCEDURE / REPORT OF TEST Nº 1.8.1

TEST NAME: BER stability Test

ELEMENT UNDER TEST: Satellite System

PROJECT: TSGT-DSO

4. Configure the EBEM2 I.A.W the SAA's. (SAT Loop) See Configuration below. Verify that TSGT, EBEM2 is lock.
5. Configure BER TESTER in the MODEM, start the BER test and verify test is free of any errors. Inject 1 Error and see it.

PROCEDURE / REPORT OF TEST N° 1.8.1

TEST NAME: BER stability Test

ELEMENT UNDER TEST: Satellite System

PROJECT: TSGT-DSO

Tx

Freq. (MHz)	1212.569
Serial DR (kbps)	2048.0
Symbol rate (kbps)	804.5
Mode	EBEM
Sub mode	Turbo
Modulation	PSK8
Predistortion	Off
Coding	7/8TURBO_4096
Interleaving	None
Diff encoding	Disabled
Scrambler	Sync
Overhead mode	None
Overhead rate (kbps)	0
Clock	Internal
Data loss option	MaintainSync

Rx

Freq. (MHz)	1213.579
Serial DR (kbps)	2048.0
Planned DR (kbps)	2111.812
Symbol rate (kbps)	804.5
Mode	EBEM
Sub mode	Turbo
Demodulation	PSK8
Equalizer	Disabled
Coding	7/8TURBO_4096
Interleaving	None
Diff encoding	Disabled
Scrambler	Sync
Overhead mode	None
Overhead rate (kbps)	0
Embedded channel	Enabled
Buffer	Enabled
Buffer size (bytes)	16384
Buffer re-center	0 Sec
Clock	Internal

Common

BB inf. status	Up
BB interface	BB422to530
Modem clock ref	AutoSense
Ext. clock (MHz)	10
Modem delay (ms)	38.1

Doppler

Doppler shift (Hz)	0
Doppler rate (Hz/s)	0
Doppler acc. (Hz/s2)	0

Encryption

Encryption status	Disabled
Encryption sync	No Sync
Encryption login	Yes

Embed. ch. status

Embed. ch. status	No Sync
Temperature (C)	30

Time: 03/11/2020 04:00:36

Loop back

Loopback test: None

Built-in tests

POST: Pass

Background BIT tests: Pass

Foreground BIT tests: No Data

FAT mode: Disabled

BERT

BERT Tx enable: On

BERT Tx pattern: 2To23rd

BERT Rx enable: On

BERT Rx pattern: 2To23rd

BERT sync. loss (s): 1

BERT sync. loss thre.: Medium

BERT bit error rate: 3.8e-08

BERT sync.: Synchronized

BERT error count: 1

BERT loss count: 0

BERT bloc error: 1

BERT pattern slip count: 0

Eb/No noise (dB): Off

6. Configure the EBEM3 I.A.W the SAA's. (SAT Loop) See Configuration below. Verify, that TSGT, EBEM3 is lock.
7. Configure BER TESTER in the MODEM, start the BER test and verify test is free of any errors. Inject 1 Error and see it.

PROCEDURE / REPORT OF TEST Nº 1.8.1

TEST NAME: BER stability Test

ELEMENT UNDER TEST: Satellite System

PROJECT: TSGT-DSO

The image displays two screenshots of the Ebem 3 software interface. The left screenshot shows the 'General' configuration page for 'Ebem 3 [Connected]'. It includes a status bar at the top with 'Modem status: Ready', 'Tx status: On', and 'Rx status: On'. Below this are various control buttons like 'Zeroize', 'Reboot', and 'Re-acquire'. The main area is divided into 'Tx' and 'Rx' sections with multiple parameters such as Freq. (MHz), Serial DR (kbps), and Modulation. A 'Common' section includes 'BB intf. status' (Up) and 'Encryption' settings. The right screenshot shows the 'Tests' page, featuring a 'Loop back' section with a 'Loopback test' dropdown set to 'None'. Below this are 'Built-in tests' and 'BERT' sections. 'Built-in tests' shows 'POST' as 'Pass' and 'Background BIT tests' as 'Pass'. The 'BERT' section includes 'BERT Tx enable' (On), 'BERT Rx enable' (On), and various error rate and count metrics.

- | | | | | |
|----|--|--|--|--|
| 8. | <p>Configure the EBEM4 I.A.W the SAA's. (SAT Loop) See Configuration below.
Verify, that TSGT, EBEM4 is lock.</p> | | | |
| 9. | <p>Configure BER TESTER in the MODEM, start the BER test and verify test is free of any errors. Inject 1 Error and see it.</p> | | | |

PROCEDURE / REPORT OF TEST Nº 1.8.1

TEST NAME: BER stability Test

ELEMENT UNDER TEST: Satellite System

PROJECT: TSGT-DSO

<p>10.</p>	<p>Configure the EBEM5 I.A.W the SAA's. (SAT Loop) See Configuration below. Verify, that TSGT, EBEM5 is lock.</p>			
<p>11.</p>	<p>Configure BER TESTER in the MODEM, start the BER test and verify test is free of any errors. Inject 1 Error and see it.</p>			

PROCEDURE / REPORT OF TEST Nº 1.8.1

TEST NAME: BER stability Test

ELEMENT UNDER TEST: Satellite System

PROJECT: TSGT-DSO

Ebem 5 [Connected]

Modem status	Ready	Tx status	On	Rx status	On	Re-acquire	
Reset		Tx level (dBm)	-18.00	Rx acq. status	Acquisition	Alarms ack.	
Carrier lock	Normal	Eb/No (dB)	10.32	Rx freq. offset (Hz)	-922	Start edit	
Eth. bit sync.	Synchroni...	Es/No (dB)	14.51	Rx buffer fill(%)	50	Apply edit	
Embed. ch. status	Synchroni...	Rx level (dBm)	-24	Rx BER	<	Cancel edit	
Control	Remote	Rx signal (dBm)	-42	Edit mode	Off		

Import Export Last message TXIF_LVL Okay

General ESEM ITA_AUPC Tests Alarms

Tx		Rx		Common	
Freq. (MHz)	1212.569	Freq. (MHz)	1213.579	BB inf. status	Up
Serial DR (kbps)	Disabled	Serial DR (kbps)	Disabled	BB interface	BB422to530
Symbol rate (kbps)	804.5	Planned DR (kbps)	2111.812	Modem clock ref	AutoSense
Mode	EBEM	Symbol rate (kbps)	804.5	Ext. clock (MHz)	No Data
Sub mode	Turbo	Mode	EBEM	Modem delay (ms)	No Data
Modulation	PSK8	Sub mode	Turbo	Doppler	
Predistortion	Off	Demodulation	PSK8	Doppler shift (Hz)	0
Coding	7/8TURBO_4096	Equalizer	Disabled	Doppler rate (Hz/s)	0
Interleaving	None	Coding	7/8TURBO_4096	Doppler acc. (Hz/s2)	0
Diff encoding	Disabled	Interleaving	None	Encryption	
Scrambler	Sync	Diff encoding	Disabled	Encryption status	Disabled
Overhead mode	None	Scrambler	Sync	Encryption sync	No Sync
Overhead rate (kbps)	0	Overhead mode	None	Encryption login	Yes
Clock	Internal	Overhead rate (kbps)	0	Embed. ch. status	Synchronized
Data loss option	MaintainSync	Embedded channel	Enabled	Temperature (C)	32
Time	03/11/2020 09:40:44	Buffer	Enabled		
		Buffer size (bytes)	16384		
		Buffer re-center	0 Sec		
		Clock	Internal		

Ebem 5 [Connected]

Modem status	Ready	Tx status	On	Rx status	On	Re-acquire	
Reset		Tx level (dBm)	-18.00	Rx acq. status	Acquisition	Alarms ack.	
Carrier lock	Normal	Eb/No (dB)	13.29	Rx freq. offset (Hz)	-953	Start edit	
Eth. bit sync.	No Sync	Es/No (dB)	17.48	Rx buffer fill(%)	50	Apply edit	
Embed. ch. status	Synchroni...	Rx level (dBm)	-31	Rx BER	<	Cancel edit	
Control	Remote	Rx signal (dBm)	-47	Edit mode	Off		

Import Export Last message BBO_CFG Okay

General ESEM ITA_AUPC Tests Alarms

Loop back

Loopback test None

Built-in tests

POST Pass

POST tests

Built-in test

Background BIT tests

Foreground BIT tests No Data

FAT mode Disabled

Eb/No noise (dB) Off

BERT

Reset BERT stat. Inject bit Error

BERT Tx enable	On
BERT Tx pattern	ZTo23rd
BERT Rx enable	On
BERT Rx pattern	ZTo23rd
BERT sync. loss (s)	1
BERT sync. loss thre.	Medium
BERT bit error rate	4.9e-08
BERT sync.	Synchronized
BERT error count	1
BERT loss count	0
BERT bloc error	1
BERT pattern slip count	0

Appendix F Key Personnel Requirements

[1] Table below lists the key personnel and required certification experience to be met. In exceptional circumstances, extensive relevance experience may be considered in lieu of official certificates

No	Key Personnel	Requirements
1	Project Manager	Responsible for project management, performance and completion of tasks and delivery orders. Establishes and monitors plans and schedules and has full authority to allocate resources to insure that the established and agreed upon plans and schedules are met. Manages costs, technical work, project risks, quality, and corporate performance. Manages the development of designs and implementation plans. Establishes and maintains contact with Purchaser, Subcontractors, and project team members. Provides administrative oversight, handles contractual matters and serves as a liaison between the Purchaser and corporate management. Ensures that all activities conform to the terms and conditions of the Contract and Work Package procedures.
1.1	Certification	Degree in management, engineering, or business administration. Formal certification through Project Management Institute or equivalent source.
1.2	Experience	At least seven years in project management. At least two years as the project manager for an effort of similar scope, preferably including the application of a formal project management methodology such as PRINCE2.
2	ISS Manager	ISS Manager will conduct the ISS Program and act as the interface with the Purchaser on all ISS matters. They will provide and implement the ISS Plan and manage all processes pertaining to its delivery. Supervises the efforts of other service personnel in the execution of assigned tasks.
2.1	Certification	Degree.
2.2	Experience	At least seven years in ISS Management. At least two years as the ISS manager for an effort of similar scope, preferably including the application of a formal service management methodology.
3	Technician	Technicians will assist in planning, synchronizing, scheduling, and tracking of TSGT assets for preventative maintenance on all NATO CIS equipment based on the Central, Operational, and Deployable Service Level Agreements; Assist in scheduling and tracking capability of activities in support of operations, exercises, projects static Communications Information Systems (CIS) and Deployable CIS (DCIS); Assists in directing, supervising, planning, coordinating, monitoring and reporting upon all technical work carried out on PMI activities & ensure that all technical work is performed in line with Agency's, industrial and/or military standards;

No	Key Personnel	Requirements
		<p>Develop detailed analysis of system deficiencies and provides advice on technical solutions in line with existing standards to ensure operational readiness for all customers and deployable Operational Systems Owners;</p> <p>Assist and monitor assigned technical tasks efficiently to ensure that they can be executed in line with set target dates. Explain and provides system technical & logistical advice to senior management & initiate necessary action to ensure that set maintenance and project targets are met;</p> <p>Assist with design and configuration documentation on TSGT & UTSGT assigned projects and systems, including required operating procedures and processes. Assist ISS Manager with the Implementation of procedures, tools and techniques for monitoring and managing performance of systems under maintenance and provides official reports;</p> <p>Assist and monitor all CIS equipment discrepancies are fully identified, investigated, documented, reported and implements corrective actions in accordance with NCI Agency directives;</p> <p>Assist with Key Performance Indicator (KPI) targets, and monitors progress against agreed quality and performance criteria. Provides effective feedback, throughout the performance management cycle, to ensure optimum performance</p>
3.1	Certification	<p>Higher vocational training in a relevant discipline, (such as, Telecommunications, Electronics, Electrical, or Computer Engineering) with 2 years of post-related experience;</p> <p>Or a secondary educational qualification with 4 years post-related experience;</p>
3.2	Experience	<p>Basic knowledge of the following transmission related topics: Knowledge of Transportable Satellite Communications equipment and be able to carry out in field/workshop repairs. Process a high level of understanding with respect to;</p> <p>Energy per bit to noise power spectral density ratio versus Bit Error Rate;</p> <p>Effective Isotropic Radiated Power calculations;</p> <p>Fourier analysis;</p> <p>Phase, Vector and Spectrum analysis;</p> <p>Various modulation techniques;</p> <p>Error coding theory;</p> <p>Fresnel zones.</p> <p>Basic mechanical and electrical engineering skills for deployable terminals; Elevation and Azimuth motor drives, servo drives, mechanical and electrical sensors and transducers;</p> <p>Basic knowledge of Fibre Optic measurements techniques, Single Mode and Multi-mode, on industrial and/or military tactical cabled networks;</p> <p>Understanding IP basics of Local and Wide Area Networking;</p> <p>Experience reading complex system diagrams (electrical and mechanical) and fault finding techniques in Super High frequency (SHF) band based deployable transmission systems;</p>

No	Key Personnel	Requirements
		<p>Fault finding experience in complex SHF based transmission system including systems with various antenna configurations;</p> <p>Recognizing digital Modulation Techniques: Phase, Frequency and Amplitude Shift Keying and various Analogue and Angle Modulation Techniques;</p> <p>Knowledge on performing measurements on antenna and sub-units: Low Noise Amplifier, Low Noise Block down converter, orthomode transducer Radio Frequency, microwave & electronic components;</p> <p>Configuring data test equipment to test radio based transmission systems in line with IP protocols (RFC 2544) and Data communication protocols;</p> <p>Knowledge of reconfiguring satellite systems in line with provided parameters, Timing, Error coding, modulation, Data rate, Bandwidth, Frequency Offsets;</p> <p>Knowledge of applying Non Ionizing Radiation safety measurements in line with ICNIRP (International Commission on Non-Ionizing Radiation Protection) and NATO standard agreement (STANAG) 2345ed3;</p> <p>Advanced understanding of power cabling and associated sub-systems, grounding and bonding, copper based structured cabling, an advanced understanding of fibre based structured cabling, working understanding of fibre optic modems, line drivers, media convertors;</p> <p>Good working knowledge of system network troubleshooting techniques utilising complex and diverse test equipment and software tools.</p>