Exhibit 16 Conducted Measurement Test Procedure

Globalstar
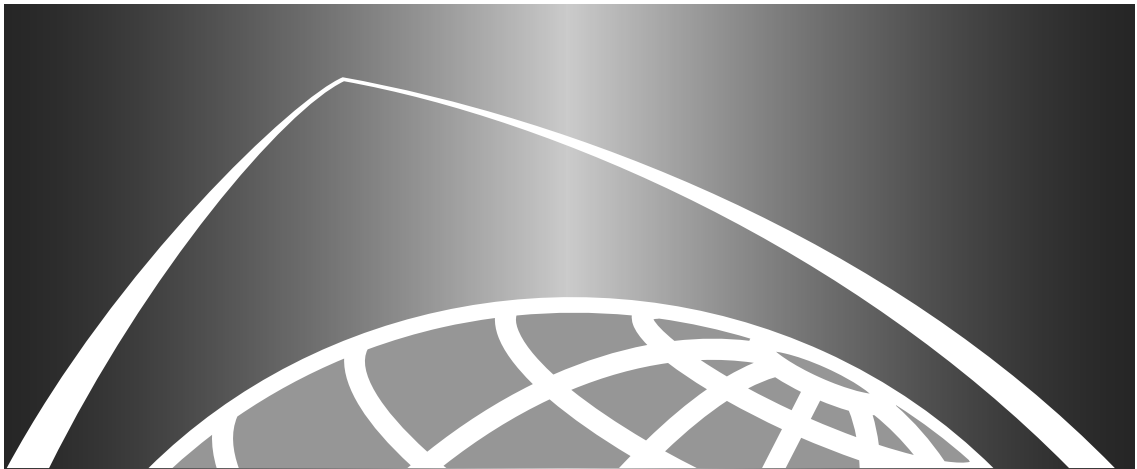
QUALCOMM®

Globalstar Compliance Lab Reverse Link Test Procedures

80-98735-1 X1

January 9, 2007

Table of Contents

Table of Figures

List of Tables

1. Introduction

1.1 Scope of this Document

This document defines the procedures for Testing Globalstar User Terminal Compliance to Minimum Performance Standards.

1.2 List of Abbreviations/Acronyms

The following abbreviations are used throughout this document.

Table 1-1 List of Abreviations

Abbreviation	Definition
AR	As Required
dB	Decibel
dB/K	dB per Kelvin
FER	Frame Error Rate
GS	Globalstar
GW	Gateway
MER	Message Error Rate
PUT	Phone Under Test
RCV	Receive
TBD	To Be Determined
TBS	To Be Specified
UT	User Terminal
XMT	Transmit
$\hat{I}_{or}$	Received Power Spectral Density of the Forward CDMA channel, plus Orthoganol Channel Interference.

No Text

2. Applicable Documents

The documents referenced in this section are applicable to the extent specified herein. They provide general information and design guidelines as well as requirements that are contractually binding to the supplier.

2.1 Document Requirements

The following documents are applicable as referred to in this specification:

Table 2-1 Required Documents

Document Title	Author/Document Number
Specification, Globalstar Air Interface	Qualcomm 80-25118-1 X5
Minimum Performance Standard for Globalstar Spread Sprectrum User Terminals	Qualcomm 80-70129-1
Satellite Personal Communications Networks (S-PCN); Mobile Earth Stations (MESs), including handheld earth stations, for S-PCN in the 1.6/2.4 GHz bands under the Mobile Satellite Service (MSS); Terminal essential requirements	ETSI TBR 041
Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) for Mobile Earth Stations (MES) used within Satellite Personal Communications Networks (S-PCN) operating in the 1,6/2,4 GHz and 2 GHz frequency bands.	EN 300-831 (ETSI)
Globalstar User Terminal Compliance Test Plan	80-98053-1

No Text

3. Requirements

3.1 General
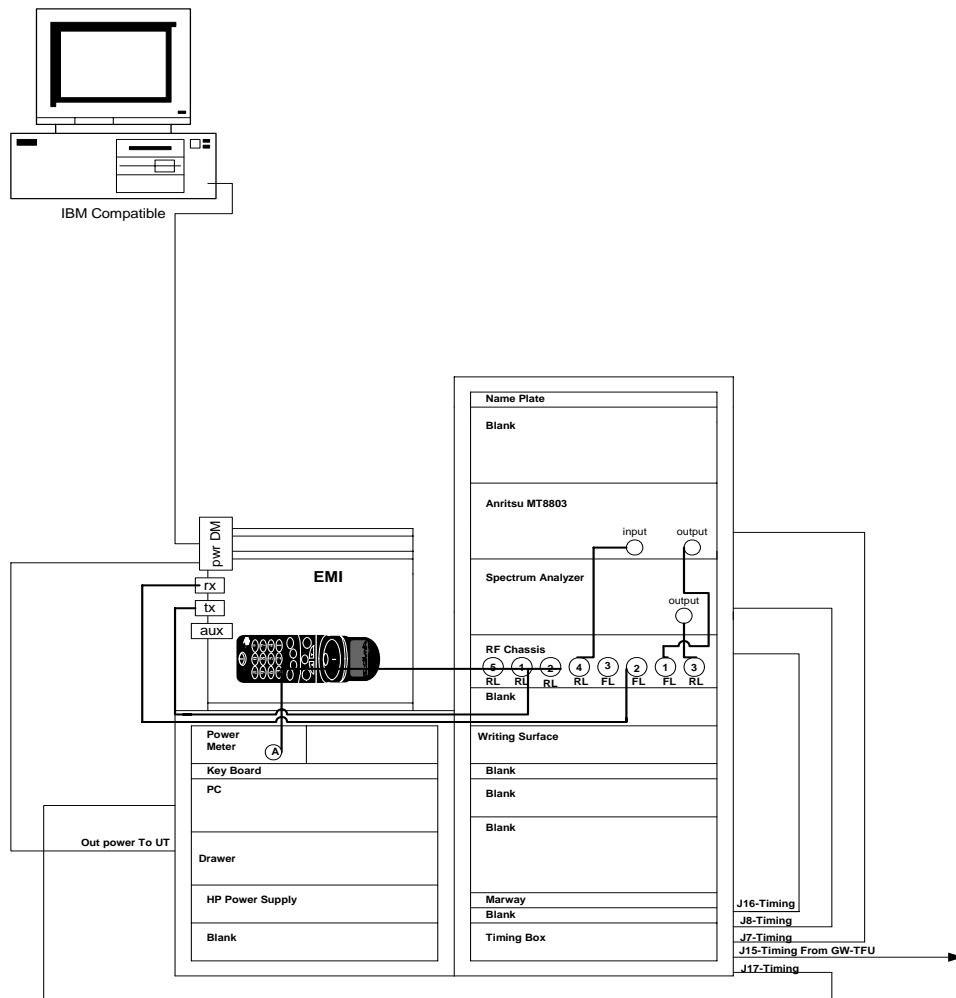
Figure 3-1 GS Reverse Link Test Rack

No Text

4. Procedures

4.1 General

4.1.1 Measurement Notes

The MT8803G and FSEM20 are controlled by buttons, and "softkeys" that appear as the user selects various "screens" of the instruments. To reach a specific function, the user has to select down through several screens until the final function required is available using the softkeys on the right-hand and bottom borders of the screen. This procedure assumes that user is familiar with the instrument, and it does not attempt to describe the process of paging through the various screens for each selection made in each test. Only when the test is sequence specific does this procedure specify the process of selecting the appropriate function.

4.1.2 Calibration

4.1.2.1 Before beginning the procedural elements of the test, ensure the Globalstar Reverse Link Test Rack has been calibrated according to the Appendix.

4.1.3 Test Sequences

4.1.3.1 It is impossible to set up a single call and perform all tests, tearing a call down, and shifting to the next channel to repeat the process. Where tests begin from common call parameters (service option, data rate, etc.) tests may be grouped together to avoid unnecessary multiple call set up/tear down sequences.

4.1.3.2 Unless otherwise specified herein, required TX channels are 1, 3, 6, 9, & 13. In some cases, multiple call set up / tear downs are required on the same frequency channel.

4.1.3.3 In the test report, highlight any signal levels or conditions that fail the identified criteria.

4.2 Access Probe Power Time Response

4.2.1 Definition

This test measures the pulse shape of the Access Probe transmitted on the Access Channel during a call set up

4.2.2 Reference

4.2.2.1 80-70129-1, 3.4.4

4.2.3 Setup

4.2.3.1 From the defaults:

4.2.3.2 Set the MT8803G Access Probes according to the following table:

Table 4-1 List of Access Probe Parameters for Time Response test

Parameter	Value
INIT_PWR	23 dBm
PWR_STEP	0
NUM_STEP	15
MAX_RSP_SEQ	15

4.2.3.3 RF Matirx:

- RLC1/RLC3 Path = position 1

4.2.3.4 FSEM20 Spectrum Analyzer:

- Attenuator = 10 dB

- RBW = 1 Mhz

- VBW = 1 MHz

- Ref. Level = -17 dBm

- Range = 50 dB

- Detector = Sample

- Mode = ZERO Span

- Sweep = 20 Averages

- Trigger = Video

- Trigger Slope = Positive

1   • Pre Trigger = 500 microseconds

2   • Manual Sweep Time = 3.6 milliseconds

3   • Gap Length = 277 milliseconds.

4   • Trigger Delay = 0 milliseconds

5   **4.2.4 Measurement Method**

4.2.4.1 If the User Terminal is not currently "IDLE Register"ed, or terminated from an earlier successful "Call", turn the power to the User Terminal Off and then On. Wait for the MT8803G state to go to "IDLE Register".

4.2.4.2 Set the level of the Video Level Trigger on the spectrum analyzer to a level of - 25 dBm.

4.2.4.3 Test 1: Access Probe Pulse Width.

4.2.4.4 Select the Measurement Window of the MT8803 to "Access Probe Power", press "Start".

4.2.4.5   Scan the spectrum Analyzer marker from left to right recording all values of power for each step of the marker.

4.2.4.6 Moving from left to right, find the first marker where the power level exceeds the first marker level by at least 55 dB. Count in by 5 marker positions and record the time position of this marker. This will be designated M_1.

4.2.4.7 Continuing to the right find the next marker time position where the power level value is at least 10 dB less than the marker whose time position was recorded. Count back by 5 marker positions and record the time position of this marker as M_2.

4.2.4.8 Find the average power level P_{avg}. of the sample values between the two identified marker positions, M_1,. M_2.

4.2.4.9 Using the marker positive and negative peak feature, rescan the spectrum analyzer display and find the maximum positive and negative power peaks in between the two time positions M_1,. M_2. Ensure these values do not exceed $\pm$ 1.5 dB from the average power value calculated.

4.2.4.10 From the recorded values, find the first marker position to the left of M_1, that has a value less than 1.5 dB below the average power value calculated. Record this marker as time position M_{12}.

4.2.4.11 Then find the first marker position to the right of the second marker, M_2, where the power level is less than 1.5 dB below the average power value calculated. Record this marker as time position M_{22}.

4.2.4.11.1 Calculate the total time between M_{21} and M_{22}, T_{M21-22}.

4.2.4.12 Test 2: Access Probe Rise Time

4.2.4.12.1 Clear the spectrum analyzer display and ready a single sweep.

4.2.4.12.2 Set the span time of the spectrum analyzer for 7 microseconds.

4.2.4.13 Set the Pre Trigger to "0" (Zero).

4.2.4.13.1 Press "start" on the MT8803G.

4.2.4.13.2 Test the spectrum analyzer to acknowledge the spectrum analyzer triggered.

4.2.4.13.3 Scan the spectrum Analyzer marker from left to right recording all values of power for each step of the marker.

4.2.4.13.4 Moving from left to right, find the first marker where the power is within $\pm$ 1.5 dB of the average pulse power level, P_{avg}., in test 1. This is position M_3.

4.2.4.13.5 Find the first marker to the left of M_3 where the power level is at least 20 dB down from the average pulse power level, M_4.

4.2.4.13.6 Find the time difference between M_3 and M_4, T_{M3-4}

4.2.4.14 Test 3:

4.2.4.14.1 Clear the spectrum analyzer display.

4.2.4.14.2 Set the trigger of the spectrum analyzer to be negative going.

4.2.4.14.3 Press "start" on the MT8803G.

4.2.4.14.4 Scan the spectrum Analyzer marker from left to right recording all values of power for each step of the marker.

4.2.4.14.5 Moving from left to right, find the <u>last</u> marker where the power is within $\pm$ 1.5 dB of the average pulse power level, P_{avg}., in test 1. This is position M_5.

4.2.4.14.6 Find the first marker to the right of M_5 where the power level is at least 20 dB down from the average pulse power level, M_6.

4.2.4.14.7 Find the time difference between M_5 and M_6, T_{M5-6}.

4.2.5 Criteria

4.2.5.1.1 The power of the Access Probe shall be within the range of 23.0 $\pm$ 0.5 dB.

4.2.5.1.2 Ensure the value of T_{M21-22} is within 20*X milliseconds $\pm$ 12.0 microseconds.

4.2.5.1.3 Ensure the value of T_{M3-4} is < 6.0 microseconds.

4.2.5.1.4 Ensure the value of T_{M5-6} is < 6.0 microseconds.

4.2.6 Test Report

4.2.6.1 Tabulate the average power level in test 1.

4.2.6.2 Tabulate the time of the pulse, T_{M21-22}.

4.2.6.3 Draw the waveform created from the samples in test 2, showing the power level on the Y axis with respect to time on the X axis, and limit lines.

4.2.6.4 Tabulate the rise time of the pulse, T_{M3-4}.

4.2.6.5 Draw the waveform created from the samples in test 1, showing the power level on the Y axis with respect to time on the X axis, and limit lines.

4.2.6.6 Tabulate the fall time of the pulse, T_{M5-6}.

4.2.6.7 Draw the waveform created from the samples in test 3, showing the power level on the Y axis with respect to time on the X axis, and limit lines.

4.3 Access Channel Waveform Quality, Timing, and Frequency Accuracy

4.3.1 Definition

This test will verify the Access Channel waveform quality, timing error, and frequency error requirement.

1 **4.3.2 Reference**

4.3.2.1 80-70129-1, 3.3.2

2 **4.3.3 Setup**

4.3.3.1 Set the MT8803G MAX_REQ_SEQ = 3

4.3.3.2 Set the MT8803G to the Reverse Link Frequency equal to the appropriate CDMA Channel.

4.3.3.3 Invoke the Modulation Parameters Screen on the MT8803G.

4.3.3.4 Invoke the Access Channel Parameters Screen on the MT8803G.

4.3.3.5 Power on the UT and wait for the UT to register.

3 **4.3.4 Measurement Method**

4.3.4.1 Invoke a continuous flow of measurements followed by "Start" on the MT8803G in the Call processing screen.

4.3.4.2 Collect the Rho measurements made by the MT8803G.

4.3.4.3 Collect the Frequency Error Measurements made by the MT8803G.

4.3.4.4 Collect the Timing Error Measurements made by the MT8803G.

4.3.4.5 Repeat the measurements for a 95% confidence level.

4 **4.3.5 Criteria:**

4.3.5.1 The Access Channel values for Rho must meet the requirements of the Minimum Performance Standard Section 3.3.1.1.

4.3.5.2 The Access Channel values for TX Frequency variation must meet the requirements of the Minimum Performance Standard Section 3.3.1.1.

4.3.5.3 The Access Channel values for Timing error must meet the requirements of the Minimum Performance Standard Section 3.3.1.1.

5 **4.3.6 Test Report**

4.3.6.1 Tabulate the maximum, minimum, and standard deviation for the Rho measurement data for each channel tested.

4.3.6.2 Tabulate the maximum, minimum, and standard deviation for the TX Frequency variation measurement data for each channel tested.

4.3.6.3 Tabulate the maximum, minimum, and standard deviation for the Timing Error measurement data for each channel tested.

4.4 Minimum Controlled Output Power

4.4.1 Definition

This test demonstrates that the User Terminal can sustain the minimum output power conditions at a sustained minimum data rate. The test equipment is used to synthesize the GW control functions (Power Control Bits).

4.4.2 Reference

4.4.2.1 80-70129-1, 3.4.6

4.4.3 Setup

4.4.3.1 Defaults

4.4.4 Measurement Method

4.4.4.1 If the User Terminal is not currently "IDLE Register"ed, or terminated from an earlier successful "Call", turn the power to the User Terminal Off and then On. Wait for the MT8803G state to go to "IDLE Register".

4.4.4.2 Set up an SO2001 Loopback call at 2400 bps.

4.4.4.3 Perform NW Originate and wait for the User Terminal to advance to the "Conversation" state as observed on the MT8803G.

4.4.4.4 Measure the User Terminal output channel power on the Spectrum Analyzer.

4.4.4.5 Send 1's power control bits to the User Terminal on the Forward Channel until the calibrated channel power on the spectrum analyzer consistently reads < 10.0 dBm/1.23 Mhz, then send alternating 1's and 0's power control bits.

4.4.4.6 Sustain the call for at least 30 seconds.

4.4.4.7 Terminate the "Call" and repeat for all channels 1, 3, 6, 9,and 13.

4.4.5 Criteria

4.4.5.1 The User Terminal must be able to sustain the "Call" at a level less than 10 dBm/1.23 MHz.

4.4.6 Test Report

4.4.6.1 Tabulate the Minimum Controlled Output Power value sustained.

4.4.6.2 If the call drops before the 30 seconds has elapsed, indicate "Call Dropped" and "Fail"

4.5 Access Probe Output Power and Standby Output Power

4.5.1 Definition

This test measures the power of the Access Probes transmitted on the Access Channel during a call set up

4.5.2 Reference

4.5.2.1 80-70129-1, 3.4.3, & (p/o) 3.4.7

4.5.3 Setup

4.5.3.1 Defaults

4.5.3.2 For Test 1, set the MT8803G Access Probes according to the following table:

1   *Table 4-2 List of Access Probe Parameters for Power Test 1*

Parameter	Value
INIT_PWR	20 dBm
PWR_STEP	0
NUM_STEP	4
MAX_RSP_SEQ	1

4.5.3.3 For Test 2, set the MT8803G Access Probes according to the following table:

2   *Table 4-3 List of Access Probe Parameters for Power Test 2*

Parameter	Value	
INIT_PWR	23 dBm	
PWR_STEP	Moble & Fixed	Portable
	3	1
NUM_STEP	3	
MAX_RSP_SEQ	1	

3 **4.5.4 Measurement Method**

4.5.4.1 If the User Terminal is not currently "IDLE Register"ed, or terminated from an earlier successful "Call", turn the power to the User Terminal Off and then On. Wait for the MT8803G state to go to "IDLE Register".

4.5.4.2 Test 1: Select the Measurement Window of the MT8803 to "Access Probe Power", press "Start" and wait for the MT8803G to display the measurement results.

4.5.4.3 Record the values of power for each probe.

4.5.4.4 Record the total number of probes.

4.5.4.5 Record the values of Standby Power between each probe.

4.5.4.6 Terminate the "Call" and repeat the test for channels 1, 3, 6, 9, and 13.

4.5.4.7 Test 2: Select the Measurement Window of the MT8803 to Access Probe Power and wait for the MT8803G to display the measurement results.

4.5.4.8 Record the values of power for each probe.

4.5.4.9 Record the total number of probes.

4.5.4.10 Record the values of Standby Power between each probe.

4.5.4.11 Terminate the "Call" and repeat the test for channels 1, 3, 6, 9, and 13.

4.5.4.12 Terminate the "Call".

[1] 4.5.5 Criteria

4.5.5.1 Test 1:

4.5.5.1.1 The power of the first Access Probe shall be within the range of 20 + 0.5 dB.

4.5.5.1.2 The power increment between consecutive access probes in each access probe sequence shall be 0 dB within $\pm$ 0.5 dB.

4.5.5.2 There shall be 5 access probes and 1 sequence.

4.5.5.3 The Standby Output Power shall be less than -30 dBm/1.23 Mhz.

4.5.5.4 Test 2:

4.5.5.4.1 The power of the first Access Probe shall be within the range of 23 $\pm$ 0.5 dB.

4.5.5.4.2 The power increment between consecutive access probes in each access probe sequence shall be 1.0 dB within $\pm$ 0.5 dB.

4.5.5.5 There shall be 4 access probes and 3 sequences.

4.5.5.6 The Standby Output Power shall be less than -30 dBm/1.23 MHz.

[2] 4.5.6 Test Report

4.5.6.1 For each entry in the test report, indicate the parameter represented, the channel number, and whether test 1 or 2.

4.5.6.2 Group and Identify the data first by test number, 1 or 2, then the associated channel number.

4.5.6.3 Tabulate the power level for each probe between the allowable lower and upper limit.

4.5.6.4 Tabulate the number of sequences detected.

4.5.6.5 Tabulate the Standby power reading measured between each probe.

4.5.6.6 Indicate for each measured parameter if the test failed the criteria.

4.6 Initial Transmission Power

> Note: This test should ordinarily be performed in order after the Access Probe Output Power test.

4.6.1 Definition

4.6.1.1 This test determines that the Traffic Channel Preamble power is the same value as the power level of the Access Probe demodulated by the GW.

4.6.1.2 This test also determines that the first Reverse Traffic Frame is 6 dB less than the Traffic Channel Preamble.

4.6.2 Reference

4.6.2.1 80-70129-1, 3.4.2.

4.6.3 Setup

4.6.3.1 Defaults

4.6.3.2 Spectrum Analyzer
- ZERO Span
- Time Span = 5 seconds
- Delay =
- Single sweep.
- Y Scale = 10 dB
- Reference Level = -5 dBm
- Video Trigger Level = -20 dBm, Rising Edge
- Video BW = 10 KHz

4.6.3.3 MT8803G

1   • Set the Call Mode of the MT8803G to S02001, 2400 bps.

2   • Set the power control bit pattern to be all 1's.

3   • Set the Access Probe parameters in the MT8803G as follows:

4   *Table 4-4 List of Access Probe Parameters for Initial Transmission Power 2*

Parameter	Value	
INIT_PWR	23 dBm	
PWR_STEP	Moble & Fixed	Portable
	3	1
NUM_STEP	3	
MAX_RSP_SEQ	1	

4.6.3.4 If the User Terminal is not currently "IDLE Register"ed, or terminated from an earlier successful "Call", turn the power to the User Terminal Off and then On. Wait for the MT8803G state to go to "IDLE Register".

4.6.3.5 Invoke "NW Originate" on the MT8803G.

4.6.3.6 On the Spectrum Analyzer, use the marker functions to measure 200 equally spaced power points along the top of each Access Probe, and the Traffic Channel Preamble.

4.6.3.7 From these samples, calculate the mean power of the Traffic Channel Preamble.

4.6.3.8 Use the marker of the spectrum analyzer to find the mean power in 40 equally spaced points in the first 20 milliseconds after the Traffic Channel Preamble.

4.6.3.9 Terminate the "Call".

4.6.3.10 Store the graphical data from the Spectrum Analyzer.

4.6.3.11 Repeat the test to include Reverse Traffic Channels 1, 3, 6, 9, & 13.

5   **4.6.4 Criteria**

4.6.4.1 The mean power found from the 200 samples of the Traffic Channel Preamble shall be within $\pm$ 0.5 dB from the mean power level of the Access Probe recognized by the MT8803G.

4.6.4.2 The mean power of the first 20 milliseconds of Traffic Channel frame transmission shall be - 6 $\pm$ 1.2 dB from the mean Traffic Channel Preamble power.

4.6.5 Test Report

4.6.5.1 Tabulate the mean power level of the Traffic Channel Preamble for each channel.

4.6.5.2 Tabulate the mean power level of the first 20 milliseconds of Traffic Channel frame transmission.

4.6.5.3 Post process the graphical data and print the result showing power level vs time.

4.7 Change of Reverse Traffic Output Power with Change of Rate

4.7.1 Definition

This test measures the accuracy of the power step change in response to a change in rate.

4.7.2 Reference

4.7.2.1 80-70129-1, 3.4.8

4.7.3 Setup

From the defaults, set:

4.7.3.1 MT8803G

- Power Control Bits = Alternatinge 1's and 0's.
- Call Mode = SO2001
- Pattern = All 1's, 2400 bps

4.7.3.2 RF Matrix

- RLC1/RLC3 path = position 1.

4.7.3.3 FSEM20 Spectrum Analyzer

1   • Attenuator = 10 dB

2   • RBW = 1 Mhz

3   • VBW = 5 KHz

4   • Ref. Level = -17 dBM

5   • Mode = ZERO Span

6   • Span = 10 msec

7   • Range = 10 dB

8   • Detector = Sample

9   • Trigger Delay = 5 msec

10 **4.7.4 Measurement Method**

4.7.4.1 Bring up a call in "Conversation" state on the User Terminal.

4.7.4.2 Using the MT8803G, send power control bits to the User Terminal to adjust the actual power level of the transmitter to +19 dB. This should give a displayed value of approximately. –25 dBm on the FSEM 20.

4.7.4.3 **Test 1**: Lower Rates to Higher Rates (2400 to 4800, 4800 to 9600, and 2400 to 9600 bps).

4.7.4.3.1 Set the level of the Video Level Trigger on the spectrum analyzer to a value 1.5 dB greater than the power level reading on the spectrum analyzer.

4.7.4.3.2 Set the spectrum analyzer to "Single Sweep" mode, "Video Trigger", "Rising Edge".

4.7.4.3.3 Using the MT8803G, change the data rate to 4800 bps.

4.7.4.3.4 Test the spectrum analyzer to acknowledge the spectrum analyzer triggered.

4.7.4.3.5 Scan the spectrum analyzer marker from left to right, recording all values of power for each step of the marker.

4.7.4.3.6 From the data collected, find the average power in the samples between 0 (extreme left of screen) and 4.5 milliseconds. This is the Marker Power Level Reference.

4.7.4.3.7 From the last sample in the average, going right, find the next sample where the positive going peak power level exceeds 1.5 times the most positive sample in the collected data samples used for power averaging.

4.7.4.3.8 From this point, back the marker to the left by 1 sample. Record this marker time as Marker Time Reference.

4.7.4.3.9 Draw the first limit line at the Marker Time Reference vertically up to 3.6 dB above the Marker Power Level Reference. This marker should extend for 2.45 milliseconds to the right.

4.7.4.4 Draw the second limit line at 500 microseconds to the right of the Marker Time Reference and 2.4 dB above the Marker Power Level Reference. This limit should extend for 1.95 milliseconds to the right.

4.7.4.5 Repeat this test for an initial 4800 bps call changing to 9600 bps.

4.7.4.6 Repeat this test for an initial 2400 bps call changing to 9600 bps. In this case, the limits will be drawn at 7.2 and 4.8 dB above the Marker Power Level Reference respectively.

4.7.4.7 Test 2: Higer Rates to Lower Rates (9600 to 4800, 4800 to 2400, and 9600 to 2400 bps).

4.7.4.8 Set up an SO2001 9600 bps loopback call.

4.7.4.9 Using the MT8803G, send power control bits to the User Terminal to adjust the actual power level of the transmitter to +24 dB. This should give a displayed value of approximately. −19 dBm on the FSEM 20.

4.7.4.9.1 Set the level of the Video Level Trigger on the spectrum analyzer to a value 1.5 dB less than the power level reading on the spectrum analyzer.

4.7.4.9.2 Set the spectrum analyzer to "Single Sweep" mode, "Video Trigger", "Falling Edge".

4.7.4.9.3 Using the MT8803G, change the data rate to 4800 bps.

4.7.4.9.4 Test the spectrum analyzer to acknowledge the spectrum analyzer triggered.

4.7.4.9.5 Scan the spectrum analyzer marker from left to right, recording all values of power for each step of the marker.

4.7.4.9.6 From the data collected, find the average power in the samples between 0 (extreme left of screen) and 4.5 milliseconds. This is the Marker Power Level Reference.

4.7.4.9.7 From the last sample in the average, going right, find the next sample where the positive going peak power level exceeds 1.5 times the most negative sample in the collected data samples used for power averaging.

4.7.4.9.8 From this point, back the marker to the left by 1 sample. Record this marker time as Marker Time Reference.

4.7.4.9.9 Draw the first limit line at the Marker Time Reference vertically down to 3.6 dB below the Marker Power Level Reference. This marker should extend for 2.45 milliseconds to the right.

4.7.4.10 Draw the second limit line at 500 microseconds to the right of the Marker Time Reference and 2.4 dB below the Marker Power Level Reference. This limit should extend for 1.95 milliseconds to the right.

4.7.4.11 Repeat this test for an initial 4800 bps call changing to 2400 bps.

4.7.4.12 Repeat this test for an initial 9600 bps call changing to 2400 bps. In this case, the limits will be drawn at 7.2 and 4.8 dB below the Marker Power Level Reference respectively.

4.7.5 Criteria

4.7.5.1 The signal rise time and plateau should fall within the mask boundaries created by the limit lines.

4.7.6 Test Report

4.7.6.1 Tabulate the Test Name, frequency, and bps rate and pass or fail status of each test.

4.7.6.2 Draw the complete 10 msec waveform captured by the sample data, with the limit lines super imposed for each test.

4.8 Gated Output Power

4.8.1 Definition

This test measures the Rise and Fall time of the power envelope of the Gated Output Power pulse in a ZERO Rate frame. The total "on-time" and ratio of power-on to power-off is also measured.

4.8.2 Reference

4.8.2.1 80-70129-1, p/o 3.4.7

4.8.3 Setup

4.8.3.1 Defaults

4.8.3.2 MT8803G:

- S01 Voice Loopback mode

4.8.4 Measurement Method

4.8.4.1 Set up a "Call" on the User Terminal.

4.8.4.2 Configure the User Terminal to send only Zero Rate Frames on the Reverse link, either by use of diagnostic tools, or by stiffling the microphone.

4.8.4.3 Select "Gated Power Measurement" on the MT8803G.

4.8.4.4 Select "Leading Edge" on the MT8803G.

4.8.4.5 Using the time offset function in the Gated Power Screen of the MT8803G, move the mask so that the leading edge "fits" within the time bounds.

4.8.4.6 Select "Falling Edge" on MT8803G.

4.8.4.7 Verify the falling edge "fits" withing the time bounds.

4.8.4.8 If the falling edge does not fit within the time bounds, use the time offset function in the Gated Power Screen of the MT8803G, to move the mask so that the falling edge just "fits" within the time bounds.

4.8.4.9 Recheck the leading edge to be sure the leading edge remains within the time bounds.

4.8.4.10 Verify the ratio of the average power "height" of the pulse or "on" time is at least 20 dB above the "off" noise floor value for both leading and falling edges.

4.8.4.11 Select the "pulse width" screen of the 8803G and verify the total pulse width is contained within the mask. The MT8803G will indicate a "PASS" condition if it does.

4.8.4.12 Repeat this test for channels 1, 3, 6, 9, and 13.

4.8.5 Criteria

4.8.5.1 All of the above sequences must pass.

4.8.6 Test Report

4.8.6.1 Tabulate the "PASS" or "FAIL" result in the last step for each channel.

4.8.6.2 Copy the screen display for each test onto disk, and post process to include in the report.

4.9 Traffic Channel Timing

4.9.1 Definition

This test will verify the Traffic Channel Timing requirement.

4.9.2 Reference

4.9.2.1 80-70129-1, 3.3.1.4

4.9.3 Setup

4.9.3.1 Set up the MT8803G to make a call with the following specifications:
- Service Option: S02001
- Data Pattern: All 0's 9600
- Frame Offset: 15 Frames

4.9.3.2 Apply the Forward Link Overhead Channels and wait for the 8803G to obtain the "IDLE REGISTRATION" state.

4.9.4 Measurement Method

4.9.4.1 From the Modulation Analysis Screen of the 8803G, select TRAFFIC.

4.9.4.2 Set the START function from the TRAFFIC MODULATION screen and collect the timing error samples (Tau) in a continuous stream with respect to time for 12 minutes. .

4.9.4.3 Calculate the timing rate of change between each successive pair of samples by subtracting the time position change of each sample relative to the previous sample taken divided by the time difference between the two samples.

4.9.4.4 Repeat step 1 with 50, 125, and 250 frame offsets.

4.9.4.5 Repeat steps 1 and 2 at 4800, 2400, and zero bps data rates

4.9.5 Criteria:

4.9.5.1 Each Traffic Channel Timing sample Error (Tau) must not exceed the maximum requirements of the Minimum Performance Standard Section 3.3.1.2.

4.9.5.2 The maximum value for the time rate of change is to be less than that specified in the Minimum Performance Standard.

4.9.6 Test Report

4.9.6.1 Indicate in the text of the Test Report the maximum positive and maximum negative value of the Tau samples in the collection.

4.9.6.2 Indicate in the text of the Test Report the maximum positive and maximum negative values of the time rate of change values calculated .

4.9.6.3 Plot the values of the Timing Error sample values on the Y axis against the time of the sample collected on the X axis.

4.9.6.4 Plot the values of the timing Rate of change on the Y axis against the time stamp of the second sample of the sample pair on the X axis.

4.10 Waveform Quality and Frequency Accuracy

4.10.1 Definition

This test will verify that UT Transmit Waveform quality and Frequency Accuracy meet the specified requirements.

4.10.2 Reference

4.10.2.1 80-70129-1, 3.3.2

4.10.3 Setup

1 Bring up a call using the MT8803G with the following specifications:

2

3 • Service Option: S02001

4 • Data Pattern: All 0's 9600

5 • Frame Offset: 0 Frames

4.10.3.1 Apply the Forward Link Overhead Channels and wait for the 8803G to obtain the "IDLE REGISTRATION" state.

6 **4.10.4 Measurement Method**

4.10.4.1 From the Modulation Analysis Screen of the 8803G, select TRAFFIC.

4.10.4.2 Set the START function from the TRAFFIC MODULATION screen and collect the frequency error samples in a continuous stream with respect to time for 12 minutes.

4.10.4.3 While collecting the samples for frequency error, also collect the time-relative values of Rho measured by the 8803.

4.10.4.4 Calculate the frequency error rate of change between each successive pair of samples by subtracting the frequency change of each sample relative to the previous sample taken divided by the time difference between the two samples.

4.10.4.5 Find the maximum, minimum, and standard deviation for the samples of Rho collected.

7 **4.10.5 Criteria:**

4.10.5.1 The Traffic Channel frequency Error and Rho (waveform quality) must meet the requirements of the Minimum Performance Standard Section 3.3.2..

8 **4.10.6 Test Report**

4.10.6.1 Tabulate the maximum, minimum, and standard deviation of the frequency error samples.

4.10.6.2 Plot the values of the frequency error sample values on the Y axis against the time of the sample collected on the X axis.

4.10.6.3 Plot the values of the frequency error rate of change on the Y axis against the time stamp of the second sample of the sample pair on the X axis.

4.10.6.4 Tabulate the maximum, minimum, and standard deviation of the frequency error samples.

4.11 Equipment Identity

4.11.1 Definition

This test demonstrates the User Terminal will identify itself based on it's unique electronic identifiers.

4.11.2 Reference

4.11.2.1 ETSI TBR 041, sec. 10.

4.11.3 Setup

4.11.3.1 Use the default Set up.

4.11.3.2 Set the MT8803G to "Call Processing", "Start".

4.11.4 Measurement Method

4.11.4.1 Apply Power to the User Terminal and wait for the 8803G to indicate "Idle Registration".

4.11.4.2 Read and record the IMSI and ESN from the screen of the MT8803.

4.11.5 Criteria

4.11.5.1 Ensure the IMSI and ESN recorded by the MT8803G match those parameters in the User Terminal.

4.11.6 Test Report

4.11.6.1 List the IMSI and ESN in the Test Report.

4.12 Network Control -- Authorization

4.12.1 Definition

This test demonstrates that the User Terminal will stop transmitting when the Forward Link (Synchronization) is Lost. This test will also demonstrate that the User Terminal will not transmit without proper authorization from a Gateway.

4.12.2 Reference

4.12.2.1 ETSI TBR 041, sec. 9.3.1

4.12.3 Setup

4.12.3.1 Default Set up

4.12.3.2 MT8803G:

- Go the Call Processing Screen, ensure the State of the MT8803G is in "Stop".
- Cycle power on the User Terminal.

4.12.3.3 FSEM Spectrum Analyzer:

- Zero Span
- Single Sweep
- Reference Level = -10 dBm

4.12.4 Measurement Method

4.12.4.1.1 Test 1: Call Attempt.

4.12.4.1.2 Attempt a mobile originated "Call" on the User Terminal.

4.12.4.1.3 Ensure No RF energy above –70 dBW (–40 dBm) is emitted from the User Terminal for a period of 5 minutes.

4.12.4.1.4 Power off the User Terminal.

4.12.4.2 Test 2: Call Self Termination.

4.12.4.2.1 Set the MT8803G to "Start"

4.12.4.2.2 Power on the User Terminal and bring up a call.

4.12.4.2.3 When the MT8803G indicates it is in the "Conversation" state, press "Stop" on the MT8803G and ensure the call enters the "IDLE" or "Termination" state within 30 seconds.

4.12.5 Criteria

4.12.5.1 Test 1:

4.12.5.1.1 Per TBR 041, No energy above −70 dBW shall be transmitted by the User Terminal without Authorization.

4.12.5.2 Test 2:

4.12.5.2.1 Per TBR 041, the call shall terminate within 30 seconds of having lost the network control sub channel (Forward Link).

4.12.6 Test Report

4.12.6.1 Test 1.

4.12.6.2 In the test report, if the Spectrum Analyzer recorded no power output from the User Terminal, indicate that the User Terminal transmitted no power above. Otherwise use the marker to read the peak power level of the User Terminal, print it on the data sheet, and mark "FAIL".

4.12.6.3 Test 2.

4.12.6.3.1 Indicate the time measured to transition from the "Conversation" state to the the "IDLE" state.

4.13 Network Control -- Transmission Enable/Disable

4.13.1 Definition

This test demonstrates that the User Terminal will stop transmitting when specifically commanded by the Gateway.

4.13.2 Reference

4.13.2.1 ETSI TBR 041, sec. 9.3.2

4.13.3 Setup

4.13.3.1 Default Set ups

4.13.3.2 MT8803G:

- Go the Call Processing Screen, ensure the State of the MT8803G is in the "Start" state.
- Cycle power on the User Terminal.

4.13.3.3 FSEM Spectrum Analyzer:

- Zero Span
- Single Sweep
- 1.25 Second Sweep Time
- External Trigger
- Reference Level = -10 dBm

4.13.4 Measurement Method

4.13.4.1 Test 1: Call Termination and Disable.

4.13.4.1.1 Attempt a mobile originated "Call" on the User Terminal.

4.13.4.1.2 Measure the maximum Power Level of the User Terminal.

4.13.4.1.3 Note that the call state on the MT8803G is in "Conversation" state.

4.13.4.1.4 Send the "Transmit Disable" command to the User Terminal.

4.13.4.1.5 After 1.5 seconds, record the data points on the Spectrum Analyzer display.

4.13.4.1.6 Use the markers to verify the power level recorded on the Spectrum Analyzer drops from full power to < 30 dBm in less than 1 second.

4.13.4.1.7 Observe the MT8803G indicates the "Call' is no longer in the "Conversation" state.

4.13.4.1.8 Cycle the User Terminal Power, and initiate a "Call",

4.13.4.1.9 Note the MT8803G indicate the "Conversation" state.

4.13.4.1.10 Terminate the "Call"

4.13.4.2 Test 2: Pre-emptive disable.

4.13.4.2.1 Without changing states from the last step of test 1;

4.13.4.2.2 Send the "Transmit Disable" command to the User Terminal.

4.13.4.2.3 Attempt to initiate a Mobile Originated Call from the User Terminal.

4.13.4.2.4 Move to the Access Channel Modulation Parameters of the MT8803G and assert Start.

4.13.4.2.5 Verify no Access Probes were generated.

4.13.4.3 Test 3: Enable.

4.13.4.3.1 Without Changing states from the last step of test 2;

4.13.4.3.2 Set the "Transmit Enable" command to "Enable".

4.13.4.3.3 Attempt to initiate a Mobile Originated "Call" from the User Terminal, and verify the MT8803G enters the "Conversation" state.

1 **4.13.5 Criteria**

4.13.5.1 Test 1. Per ETSI TBR 041, 9.3.2.1.5 (a-c)

4.13.5.2 Tthe power level recorded on the Spectrum Analyzer drops from full power to < 30 dBm in less than 1 second. Per TBR 041, No energy above −70 dBW shall be transmitted by the User Terminal without Authorization., indicating that the "Call" was terminated by the Transmit Enable – Disable command.

4.13.5.2.1 Test 2. Per ETSI TBR 041, 9.3.2.1.5 (e-f)

4.13.5.2.2 Per ETSI TBR 041, no transmissions shall occur after the receipt of a "Disable" command.

4.13.5.2.3 Test 3 Per ETSI TBR 041, 9.3.2.1.5 (d)

4.13.5.2.4 The ability to resume calling shall be demonstrated after receipt of the enable.

2 **4.13.6 Test Report**

4.13.6.1 Test 1:

4.13.6.1.1 Tabulate the time measured for the User Terminal to stop transmitting.

4.13.6.1.2 Test 2:

4.13.6.1.3 Indicate that User Terminal did or did not register access probes.

4.13.6.1.4 Test 3:

4.13.6.1.5 Indicate that the User Terminal was or was not able to restore transmitting.

4.13.6.2 In the test report, if the Spectrum Analyzer recorded no power output from the User Terminal, indicate that the User Terminal transmitted no power above. Otherwise use the marker to read the peak power level of the User Terminal, print it on the data sheet, and mark "FAIL".

4.13.6.3 In the test report, if the Spectrum Analyzer recorded no power output from the User Terminal, indicate that the User Terminal transmitted no power above. Otherwise use the marker to read the peak power level of the User Terminal, print it on the data sheet, and mark "FAIL".

4.14 Rx Frequency Requirements

4.14.1 Definition

This test serves to verify the setability and accuracy of the UT Receiver Local Oscillator with reference to a GPS standard reference.

4.14.2 Reference

4.14.2.1 80-70129-1, 2.1.

4.14.3 Setup

> Note: It is economically more advantageous to perform this test in it's entirety for all frequencies rather than performing it intermixed among other tests on the same frequency channel.

4.14.3.1 Ensure the test environment of the User Terminal is under ambient conditions.

4.14.3.2 Set the User Terminal searcher frequency list to cover all primary frequencies, 1 - 13.

4.14.3.3 Set all instrumentation and RF Matrix for defaults.

4.14.4 Measurement Method

4.14.4.1 Set the MT8803G Forward Link Frequency for Channel 1 according to the table.

Table 4-5 List of Receive Frequencies

Channel Number	Set Frequency	Minimum Variance	Maximum Variance
1	2484.39		
2	2485.62		
3	2486.85		
4	2488.08		
5	2489.31		
6	2490.54		
7	2491.77		
8	2493.00		
9	2494.23		
10	2495.46		
11	2496.69		
12	2497.92		
13	2499.15		

4.14.4.2 Turn on the Forward Link Channels in the MT8803G.

4.14.4.3 After the searcher acquires the Pilot, record the RCV frequency offset of the User Terminal using the Monitor Program.

4.14.4.4 Continue to monitor the frequency for 5 minutes, recording the value every 15 seconds.

4.14.4.5 On the MT8803G, stop the transmissions on the Forward Channel, set the frequency of the MT8803G to the next channel in the table, and repeat steps 4.14.4.1 through 4.14.4.4 `

4.14.4.6 Repeat 4.14.4.5 for all remaining frequencies in the Table.

4.14.5 Criteria

4.14.5.1 The frequency offset values from the ideal must remain within the values specified in the Table. These values are for the initial frequencies and exclued long term drift on a basis of the product life equal to 3 (TBR) years.

4.14.6 Test Report

4.14.6.1 Tabulate the initial and final frequency reading taken for each channel.

4.14.6.2 Graph the samples of frequency error vs. time (15 sec. intervals) for each channel, respectively.

4.15 Satellite and Beam Acquisition Performance

4.15.1 Definition

This test determines the time required for the User Terminal to acquire a Pilot and enter the IDLE sub state. This test will use the User Terminal Monitor utility to indicate the change in call sub state.

4.15.2 Reference

4.15.2.1 80-70129-1, 2.2.1.

4.15.3 Setup

4.15.3.1 The User Terminal Under Test is set to listen to only 1 FDM Frequency, channel 9, (1618.11 Mhz).

4.15.4 Measurement Method

4.15.4.1 Set the User Terminal Power switch to "OFF".

4.15.4.2 Set the MT8803G call processing state to START.

4.15.4.3 Turn on the User Terminal power switch (using UT power "control button" and note the time.

4.15.4.4 Record the time when the User Terminal Indicates the transistion to the "IDLE" state.

4.15.4.5 Subtract the time stamp to attain the "IDLE" state from the time stamp for turning on the UT power.

4.15.4.6 Repeat 4.15.4.1 to 4.15.4.4 for 100 cycles.

4.15.5 Criteria

4.15.5.1 The maximum time the User Terminal takes to pass from to the "IDLE" state from the power on state shall be less than 15 seconds.

4.15.6 Test Report

4.15.6.1 From the logged timestamp data collected for each of the 100 cycles, calculate and print the Mean value of time required for the User Terminal to pass to the "IDLE" state.

4.15.6.2 Record the Maximum time required to pass to the "IDLE" state. Indicate a "Failure if any of the this time ever exceeds 15 seconds.

4.15.6.3 Plot the time recorded to transition to the "IDLE" state of each sample, in chronological order.

4.16 Maximum Channel Power (EIRP Density)

4.16.1 Definition

This test measures the maximum RF output at the UT antenna connector and computes the Effective Isotropic Radiated Power (EIRP) based on the Antenna Factor(s) Gain vs. Frequency.

4.16.2 Reference

4.16.2.1 80-70129-1, 3.4.3

4.16.2.2 ETSI TBR 041, sec. 7

4.16.3 Setup

4.16.3.1 Specify the Antenna Factor as a set of Gain vs. Frequency values by entering the Maximum Gain value in dB, span start frequency and span stop frequency for each gain value across the entire span from 100 KHz to 16.5 GHz.

4.16.3.2 Setup Power Meter as follows:
- Sensor Type = Modulated Average
- Frequency = (Measured center frequency of Channel)

4.16.3.3 Setup the FSEM 20 as follows:

1 • Reference Level = 0dB

2 • Attenuator = 0dB

3 • Center Frequency = (Measured center frequency of Channel)

4 • RBW = 30KHz

5 • VBW = 300KHz

6 • Frequency Span = 2.46MHz

7 • Sweep Time = 2sec.

8 • Channel Power Bandwidth = 1.23MHz For Mean EIRP density:

9 • Detector = Average

10 • Measurement Type = Average (200 samples)

11 • For Peak EIRP density:

12 • Detector = Peak

13 • Measurement Type = Peak

14 • Channel Power Bandwidth = 1.23MHz

15 **4.16.4 Measurement Method**

4.16.4.1 Set the frequency channel on the MT8803G to TX channel 1, and bring up the call on the UT.

4.16.4.2 Measure the Power on the Power Meter.

4.16.4.3 As a point of reference, calculate the Maximum power from the measured Power of the Power Meter & Path Loss, subtracting 30dB (to convert dBm to dBW) and the Antenna Factor. *(Power = Measured Power + Path Loss – 30.0dB + Antenna Factor).*

4.16.4.4 Measure the CDMA channel power on the FSEM 20.

4.16.4.5   Calculate the maximum EIRP power from the measured Channel Power & Path Loss, subtracting 30dB (to convert dBm to dBW) and subtracting 24.878 dB (scale factor from 1.23 MHz BW to 4 KHz BW. *(EIRP power = Measured Power + Path Loss – 30.0dB - 24.878dB + Antenna Factor.)*

4.16.4.6 Calculate the Maximum CDMA Channel power in 1.23 MHz by taking a channel power measurement from the FSEM 20 and Power reading from the Power Meter adjust each for calibration and subtract 30dB (to convert dBm to dBW*). (Max Power = Measured Power + Path Loss – 30.0dB + Antenna Factor.)*

16 **4.16.5 Criteria:**

4.16.5.1 The calculated measurement for Maximum EIRP must meet the requirements of TBR 041, Para. 7.3.

4.16.5.2 The calculated measurement for Maximum CDMA Power must meet the requirements of the Minimum Performance Standard Section 3.4.5.3.

4.16.6 Test Report

4.16.6.1 Tabulate the value of calculated EIRP in dBW/1.23 MHz for the Power Meter (reference only).

4.16.6.2 Tabulate the value of calculated EIRP in dBW/4KHz for the FSEM 20.

4.16.6.3 Tabulate the CDMA Channel Power value calculated with the FSEM 20 and Power Meter.

4.17 TX Out of Band Noise and Spurious Emissions -- ETSI

4.17.1 Definition

This test measures undesired RF energies emitted into the general radio spectrum from the User Terminal as a result of normal, desired transmissions. Like EIRP the Antenna Factor is applied to the measured levels to establish the field strength of the undesired energies.

4.17.2 Reference

4.17.2.1 80-70129-1, 3.5.1, 3.5.1.3.4

4.17.2.2 ETSI TBR 041, sec. 5

4.17.3 Set up

4.17.3.1 Continue from the EIRP test.

4.17.3.2 Setup the FSEM 20 Spectrum Analyzer Span to its Preset condition then change the Start frequency, Stop frequency, RBW, VBW, Detector mode, and Measurement mode according to the frequency band under test in the ETSI TBR 041 Table 2. For the last band in Table 2 of the TBR 041 sub-divide the band into 5 overlapping spans of approximately 2 GHz each.

4.17.3.3 For the appropriate filter to use when testing a certain band on a selected channel See table 4-1

4.17.3.4 Setup and maintain a SO2001 call at 9600 bps with max power on the channel of interest.

1   ***Table 4-6*** *List of ETSI Filters*

Channel	Frequency Band	Filter
1 to 3	10 to 1608.75 MHz	Channel 1 notch
1 to 3	1608.75 to 1610 MHz	26dB Atten though
1 to 3	2200 to 12,750 MHz	High pass filter
4 to 9	1628.5 to 1630.5 MHz	26dB Atten though
4 to 9	1630.5 to 2200 MHz	Channel 4 – 9 notch
4 to 9	2200 to 12,750 MHz	High pass filter

2   **4.17.4 Measurement:**

4.17.4.1 Ensure the RF Matrix SW 3 / 4 Switch is set to the FL1 NOTCH if the Frequency is CDMA Channel 1, otherwise set the switch to FL2 NOTCH.

4.17.4.2 Set up the FSEM 20 Spectrum Analyzer Span, RBW, VBW, and Detector Mode according to the first Frequency band identified in ETSI TBR 041, Table 2 (0.1 to 30 MHz).

4.17.4.3 While maintaining the "Call", Sweep the FSEM 20 Spectrum Analyzer over the full span recording the 50 highest spurs.

4.17.4.4 Record the calibrated spurs by adding the value of the Path Loss for RLC1 to RLC3 FL1 or FL2 NOTCH (as appropriate), plus, the path loss of the Test Adapter, plus the Antenna Factor to the reading for each spur according to the spur frequency.

4.17.4.5 Repeat this process for all other Frequency Bands in Table 2 up to 2200 MHz, for this same UT Transmit Frequency. Record the 50 highest spurs in each band.

4.17.4.6 Switch the RF Matrix SW 3 / 4 to HIGH PASS. Continue the sweep of the FSEM 20 for frequency bands in table 2 higher than 2200 MHz for the 50 highest spurs in each band.

4.17.4.7 Record the calibrated spurs by adding the value of the Path Loss for RLC1 to RLC3 "HIGH PASS", plus, the path loss of the Test Adapter, plus the Antenna Factor to the reading for each spur according to the spur frequency (Note: Assume the last Band in TBR 041 Table 2 to be sub-divided into 5 overlapping spans of approximately 2 GHz each

4.17.5 Criteria:

4.17.5.1 All of the Spur power levels must be below the levels established for each of the frequency bands as specified in TBR 041, Table 2. (ETSI Requirement.)

4.17.5.2 All of the Spur power levels in the frequency range of 2483.5 and 2500 MHz must be below –125 dBW/MHz. (Globalstar requirement.)

4.17.6 Test Report

4.17.6.1 In the main body of the report, for each channel frequency tested, plot the calibrated power levels for each spur measurement against the frequency of each spur using the ETSI limits. Resolution shall be 1 span per page.

4.17.6.2 For each channel frequency tested, plot the calibrated power levels for each spur measurement against the frequency of each spur using the Globalstar limits from table 3.9 in 80-70129-1. Resolution shall be 1 span per page. The power level specified can be adjusted for the measurement RBW on the basis of 10 Log (RBW1/RBW2).

4.17.6.3 Maintain the database file of the tabular calibrated power vs. frequency values. This report shall be printed on request.

4.18 TX Out of Band Noise and Spurious Emissions – FCC Part 25

4.18.1 Definition

This test measures undesired RF energies emitted into the general radio spectrum from the User Terminal as a result of normal, desired transmissions. Like EIRP the Antenna Factor is applied to the measured levels to establish the field strength of the undesired energies.

4.18.2 References

4.18.2.1 FCC part 25, Section 25.202

4.18.3 Set up

4.18.3.1 Continue from the EIRP test.

4.18.3.2 Setup the FSEM 20 Spectrum Analyzer Span to its Preset condition then change the Start frequency, Stop frequency, RBW, VBW, Detector mode, and Measurement mode according to the frequency band under test in the ETSI TBR 041 Table 2. For the last band in Table 2 of the TBR 041 sub-divide the band into 5 overlapping spans of approximately 2 GHz each.

4.18.3.3 For the appropriate filter to use when testing a certain band on a selected channel See table 4-1

4.18.3.4 Setup and maintain a SO2001 call at 9600 bps with max power on the channel of interest.

1   *Table 4-7* *List of FCC Part 25 Filters*

Channel	Frequency Band	Filter
1 to 3	10 to 1608.75 MHz	Channel 1 notch
1 to 3	1608.75 to 1610 MHz	26dB Atten though
1 to 3	2200 to 16,500 MHz	High pass filter
4 to 9	1628.5 to 1630.5 MHz	26dB Atten though
4 to 9	1630.5 to 2200 MHz	Channel 4 – 9 notch
4 to 9	2200 to 16,500 MHz	High pass filter

2 **4.18.4 Measurement:**

4.18.4.1 Ensure the RF Matrix SW 3 / 4 Switch is set to the FL1 NOTCH if the Frequency is CDMA Channel 1, otherwise set the switch to FL2 NOTCH.

4.18.4.2 Set up the FSEM 20 Spectrum Analyzer Span, RBW, VBW, and Detector Mode according to the first Frequency band identified in FCC Part 25, Section 25.202.

4.18.4.3 While maintaining the "Call", Sweep the FSEM 20 Spectrum Analyzer over the full span recording the 50 highest spurs.

4.18.4.4 Record the calibrated spurs by adding the value of the Path Loss for RLC1 to RLC3 FL1 or FL2 NOTCH (as appropriate), plus, the path loss of the Test Adapter, plus the Antenna Factor to the reading for each spur according to the spur frequency.

4.18.4.5 Repeat this process for all other Frequency Bands in 25.202 up to 2921 MHz, for this same UT Transmit Frequency. Record the 50 highest spurs in each band.

4.18.4.6 Switch the RF Matrix SW 3 / 4 to HIGH PASS. Continue the sweep of the FSEM 20 for frequency bands in 25.202 higher than 2921 MHz for the 50 highest spurs in each band.

4.18.4.7 Record the calibrated spurs by adding the value of the Path Loss for RLC1 to RLC3 "HIGH PASS", plus, the path loss of the Test Adapter, plus the Antenna Factor to the reading for each spur according to the spur frequency (Note: Assume the last Band in 25.202 to be sub-divided into 5 overlapping spans of approximately 2 GHz each. The band from 2921 to 6500 should be divided into 2 nearly equal spans.

4.18.5 Criteria:

4.18.5.1 All of the Spur power levels must be below the levels established for each of the frequency bands as specified in 25.202.

4.18.6 Test Report

4.18.6.1 In the main body of the report, for each channel frequency tested, plot the calibrated power levels for each spur measurement against the frequency of each spur using the FCC limits. Resolution shall be 1 span per page.

4.18.6.2 Maintain the database file of the tabular calibrated power vs. frequency values. This report shall be printed on request.

4.19 TX In-Band Noise and Spurious Emissions

4.19.1 Definition

This test measures undesired RF energies emitted into the radio spectrum that is shared with other Globalstar User Terminals, as a result of normal desired transmissions. Like EIRP, the antenna gain is applied to the measured result to establish the field strength of the undesired energies.

4.19.2 Reference

4.19.2.1 80-70129-1, 3.5.1.3.1

4.19.2.2 ETSI TBR 041, sec. 6

4.19.3 Setup

4.19.3.1 Continue from the previous test.

4.19.3.2 Switch the RF Matrix SW 3 / 4 Switch to THRU.

4.19.3.3 FSEM 20 Spectrum Analyzer:

1   • CF = <u>Assigned</u> CDMA Channel Frequency

2   • Span = 4 MHz

3   • RBW = 30 KHz

4   • VBW = 30 KHz

5   • Detector Mode = Peak Average

6   • Averages = 50

7   • Sweep Time = Auto

8   **4.19.4 Measurement:**

4.19.4.1 Test 1: While maintaining the "Call", Sweep the FSEM 20 Spectrum Analyzer over the span established by the first 3 upper and lower Frequency Offsets in TBR 041 Table.

4.19.4.2 Record 100 equally spaced power level data points tracing the UT Transmitter sidebands. Also, record the highest 100 Spurs.

4.19.4.3 Add the values of the Path Loss for RLC1 to RLC3 THRU (Normal Range), plus, the path loss of the Test Adapter, and the antenna factor, to the power level readings for each spur and/or data point. Subtract 30 dB (dBm to dBW conversion) from each point and record as EIRP in dBW.

4.19.4.4 Test 2: Set the START FREQUENCY of the FSEM 20 to the CDMA Channel Frequency + 1.800 MHz and set the SPAN to 16.50 MHz. Collect the data points tracing the UT Transmitter sidebands to 17150 KHz greater than the CDMA Center Frequency.

4.19.4.5 Collect a minimum of 100 equally spaced power level data points tracing the UT Transmitter sidebands. Also, collect the highest 50 Spurs.

4.19.4.6 Add the value of the Path Loss for RLC1 to RLC3 THRU (Normal Range), plus, the path loss of the Test Adapter, and the antenna factor, to the power level readings for each frequency point. Subtract 30 dB and record as EIRP in dBW.

4.19.4.7 Test 3: Set the STOP FREQUENCY of the FSEM 20 to the CDMA Channel Frequency - 1.800 MHz and set the SPAN to 16.50 MHz. Collect the data points tracing the UT Transmitter sidebands to 17150 KHz lower than the CDMA Center Frequency.

4.19.4.8 Collect a minimum of 100 equally spaced power level data points tracing the UT Transmitter sidebands. Also, collect the highest 50 Spurs .

4.19.4.9 Add the value of the Path Loss for RLC1 to RLC3 THRU (Normal Range), plus, the path loss of the Test Adapter, and the antenna factor, to the power level readings for each frequency point. Subtract 30 dB and record as EIRP in dBW...

4.19.5 Criteria

> Note: The values of Frequency Offset in TBR 041 Section 6 are applied from the edge of the Nominated Bandwidth of 2.45 MHz. This means that for CDMA channel 9 the limits in the first frequency band of 0 to 160 KHz start to apply at CF $\pm$ 1.225 MHz. The second frequency band at CF $\pm$ 1.385 MHz and so on.

4.19.5.1 For all tests: Spurs and Power Levels in the range of frequency offset values above and below the Nominated Band edges in the plots for channels 1,3,and 6, must be below the limits specified in TBR 041, Table 4.

4.19.5.2 For all tests: Spurs and Power Levels in the range of frequency offset values above and below the Nominated Band edges in the plots for channel 9, must be below the limits specified in TBR 041, Table 4.Test Report

4.19.5.3 In the main body of the report, separately plot each of the 3 groups of Power Level values from each measurement against the respective frequency points.

4.19.5.4 Maintain a database file of the tabular calibrated power vs. frequency values. This report shall be printed on request.

4.20 RX Conducted Noise and Spurious Emissions -- FCC Part 25

> Note: With a passive Antenna, this test is performed with respect to the UT antenna connector. When the antenna includes integrated amplification, the UT shall have a modified antenna with a matched connector terminal in place of the receive passive element.

4.20.1 Definition

This test measures undesired RF energies emitted into the general radio spectrum from the User Terminal when the tranmsitter is off as a result of normal, desired receiver operation. Like EIRP the Antenna Factor is applied to the measured levels to establish the field strength of the undesired energies.

4.20.2 Reference

4.20.2.1 FCC part 25, Section 25.202

4.20.3 Set up

4.20.3.1 Continue from the EIRP test.

4.20.3.2 Setup the FSEM 20 Spectrum Analyzer Span to its Preset condition then change the Start frequency, Stop frequency, RBW, VBW, Detector mode, and Measurement mode according to the frequency band under test 25.202. For the last band sub-divide the band into 5 overlapping spans of approximately 2 GHz each.

4.20.3.3 Filters are not used.

4.20.3.4 Setup and maintain a SO2001 call at 9600 bps with max power on the channel of interest.

4.20.4 Measurement:

4.20.4.1 Ensure the RF Matrix SW 3 / 4 Switch is set to the FL1 NOTCH if the Frequency is CDMA Channel 1, otherwise set the switch to FL2 NOTCH.

4.20.4.2 Set up the FSEM 20 Spectrum Analyzer Span, RBW, VBW, and Detector Mode according to the first Frequency band identified in FCC Part 25, Section 25.202.

4.20.4.3 While maintaining the "Call", Sweep the FSEM 20 Spectrum Analyzer over the full span recording the 50 highest spurs.

4.20.4.4 Record the calibrated spurs by adding the value of the Path Loss for FLC2 to RLC3, plus, the path loss of the Test Adapter, plus the Antenna Factor to the reading for each spur according to the spur frequency.

4.20.4.5 Repeat this process for all other Frequency Bands in 25.202. Record the 50 highest spurs in each band. The band from 2921 to 6500 should be divided into 2 nearly equal spans.

4.20.5 Criteria:

4.20.5.1 All of the Spur power levels must be below the levels established for each of the frequency bands as specified in 25.202.

4.20.6 Test Report

4.20.6.1 In the main body of the report, for each channel frequency tested, plot the calibrated power levels for each spur measurement against the frequency of each spur using the FCC limits. Resolution shall be 1 span per page.

4.20.6.2 Maintain the database file of the tabular calibrated power vs. frequency values. This report shall be printed on request.

4.21 RX Conducted Noise and Spurious Emissions -- Out of Band

Note: With a passive Antenna, this test is performed with respect to the UT antenna connector. When the antenna includes integrated amplification, the UT shall have a modified antenna with a matched connector terminal in place of the receive passive element.

4.21.1 Definition

This test measures undesired RF energies emitted into the general radio spectrum from the User Terminals receiver as a result of normal operation.

4.21.2 Reference

4.21.2.1 80-70129-1, 2.6.1

4.21.2.2 ETSI TBR 041, sec. 5

4.21.3 Set up

4.21.3.1 RF Matrix
- Set SW5 to position 2
- Set SW 4 to position 5
- Set SW1 to position 5 (FLC2)

4.21.3.2 FSEM 20 Spectrum Analyzer:

1   • Span = Preset

2   • Start frequency, Stop frequency, RBW, VBW, Detector mode, and
3   Measurement mode according to the frequency band under test in the ETSI
4   TBR 041 Table 2.

5   • For the last band in Table 2 of the TBR 041 sub-divide the band into 5
6   overlapping spans of approximately 2 GHz each.

4.21.3.3 No Filters are used.

4.21.3.4 Power On the User Terminal. (It will not be possible to make a "call")

7   **4.21.4 Measurement:**

4.21.4.1 Set up the FSEM 20 Spectrum Analyzer Span, RBW, VBW, and Detector
Mode according to the first Frequency band identified in ETSI TBR 041, Table 2 (0.1
to 30 MHz).

4.21.4.2 Sweep the FSEM 20 Spectrum Analyzer over the full span recording the 50
highest spurs.

4.21.4.3 Record the calibrated spurs by adding the value of the Path Loss for FLC2
to RLC3, plus, the path loss of the Test Adapter, plus the Antenna Factor to the
reading for each spur according to the spur frequency.

4.21.4.4 Repeat this process for all other Frequency Bands in Table. Record the 50
highest spurs in each band. (Note: Assume the last Band in TBR 041 Table 2 to be
sub-divided into 5 overlapping spans of approximately 2 GHz each.)

8   **4.21.5 Criteria:**

4.21.5.1 All of the Spur power levels must be below the levels established for each
of the frequency bands as specified in TBR 041, Table 2.

9   **4.21.6 Test Report**

4.21.6.1 In the main body of the report, plot the calibrated Power Levels for each
spur measurement against the frequency of each spur. Resolution shall be 1 span
per page.

4.21.6.2 Maintain the database file of the tabular calibrated power vs. frequency
values. This report shall be printed on request.

4.22 Unwanted Emissions in Carrier-Off State -- ETSI

4.22.1 Definition

This test measures the Emissions from the UT Transmitter when in the carrier off state. This is condition where the UT is powered on with normal receiver operations but not transmitting.

4.22.2 Reference

4.22.2.1 ETSI TBR 041 sec. 8.0

4.22.3 Setup

4.22.3.1 Defaults

4.22.3.2 RF Matrix = RLC1 to RLC3, path 6.

4.22.3.3 No Filters are used.

4.22.4 Measurement Method

4.22.4.1 Power on the User Terminal and observe the User Terminal passes to the "IDLE RGEGISTER" state.

4.22.4.2 Set the MT8803G Primary Beam Sync, Paging, and Traffic Channels to "Off".

4.22.4.3 Set up the FSEM 20 Spectrum Analyzer Span, RBW, VBW, and Detector Mode according to the first Frequency band identified in ETSI TBR 041, Table 2 (0.1 to 30 MHz).

4.22.4.4 Sweep the FSEM 20 Spectrum Analyzer over the full span recording the 50 highest spurs.

4.22.4.5 Record the calibrated spurs by adding the value of the Path Loss for FLC2 to RLC3, plus, the path loss of the Test Adapter, plus the Antenna Factor to the reading for each spur according to the spur frequency.

4.22.4.6 Repeat this process for all other Frequency Bands in Table. Record the 50 highest spurs in each band. (Note: Assume the last Band in TBR 041 Table 2 to be sub-divided into 5 overlapping spans of approximately 2 GHz each.)

4.22.5 Criteria:

4.22.5.1 All of the Spur power levels must be below the levels established for each of the frequency bands as specified in TBR 041, Table 2.

4.22.6 Test Report

4.22.6.1 In the main body of the report, plot the calibrated Power Levels for each spur measurement against the frequency of each spur. Resolution shall be 1 span per page.

4.22.6.2 Maintain the database file of the tabular calibrated power vs. frequency values. This report shall be printed on request.

4.23 Paging Channel Supervision

4.23.1 Definition

TBD

4.23.2 Reference

4.23.2.1 80-70129-1, 2.7

4.23.3 Setup

4.23.4 Measurement Method

4.23.5 Criteria

4.23.6 Test Report

4.24 Traffic Channel Supervision

4.24.1 Definition

TBD

4.24.2 Reference

4.24.2.1 80-70129-1, 2.7

4.24.3 Setup

4.24.4 Measurement Method

4.24.5 Criteria

4.24.6 Test Report

4.25 Range of Closed Loop Power Control

4.25.1 Definition

TBD

4.25.2 Reference

4.25.2.1 80-70129-1, 3.4.1

4.25.3 Setup

4.25.4 Measurement Method

4.25.5 Criteria

4.25.6 Test Report

1

1 ## *5. Appendicees*

2 ## *5.1 Appendix A Test Set Calibration Procedures*

3 ### 5.1.1 Minimum calibration requirements

5.1.1.1 All test equipment shall have been powered up at stabilized at the ambient room temperature for at least 24 Hours prior to performing the calibration.

5.1.1.2 Calibration Intervals:

5.1.1.2.1 The Gigatronix Power Meter shall be calibrated on an interval of no less than 6 months.

5.1.1.2.2 All other instruments shall be maintained on a calibration interval consistent with standards set by the test equipment support organization.

5.1.1.2.3 Calibration of the test system shall occur at the beginning of the test sequence for each individual User Terminal Tested. Calibration of the test system shall occur no less than every 48 hours of use thereafter.
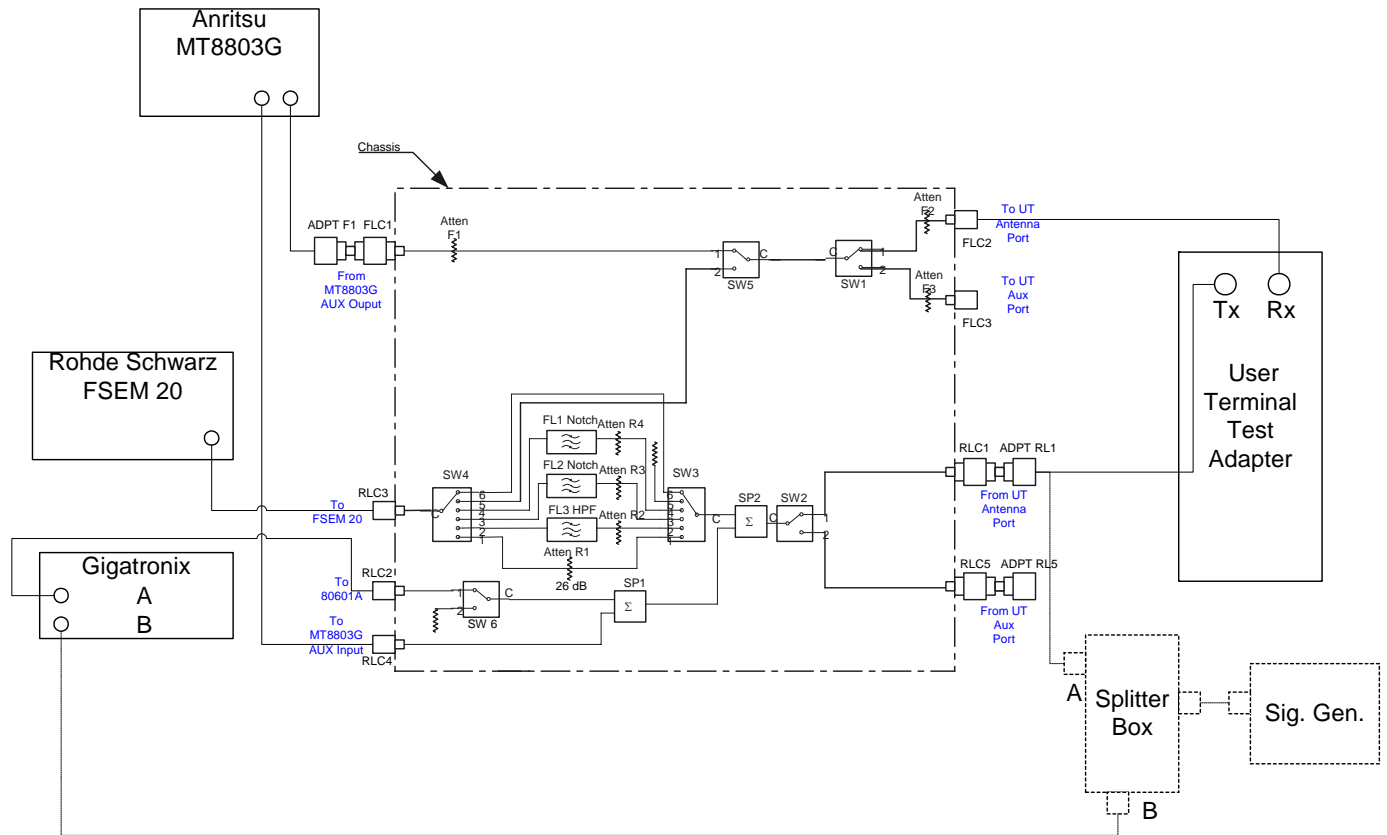
Figure 5-1 Tester Block Diagram

5.1.2 Power Meter Calibration

Prior to performing calibration on the test system, the Power Meter must be calibrated to the reference.

5.1.2.1 Power Head "A".

5.1.2.1.1 Attach power head "A" to the calibrator output of the Power Meter.

5.1.2.1.2 Set the frequency of operation for 1618.11 Mhz.

5.1.2.1.3 Set the "Mode" for "Modulation".

5.1.2.1.4 Press the "Zero" key and wait for the display to indicate the calibration complete.

5.1.2.1.5 Remove the power head from the calibrator and install a 50 ohm termination.

5.1.2.1.6 Again press the "Zero" key and wait for the display to indicate the process to be complete. Remove the termination.

5.1.2.2 Power Head "B".

5.1.2.2.1 For Power Head "B", repeat the same process as for "A".

5.1.3 Test Rack Calibration

All power level measurement criteria in the Procedures section of this document are with respect to the antenna connectors of the User Terminal, unless otherwise specified herein. Connectivity between the User Terminal Under Test and the instrumentation necessitates:

- User Terminal to test set test adapter and cable
- RF Conditioning Matrix to separate, switch, and filter signals appropriately
- Cabling between the instrumentation & RF Matrix

Because the measurements necessitate the use of cables, switches and other conditioning equipment in the measurement path(s), the effects of these elements parasitically influence the indicators on the instruments used, and must be calibrated out of the final measurements.

In every measurement of the procedure, the final criteria assumes that the measurement result has been corrected for these parasitic influences, and include:

- The Instrument reading(s) corrected relative to power head A of the Gigatronix Power Meter
- The Gain (negative for a loss) of the Test Adapter and Cable
- The Gain (negative for a loss) of the RF Matrix path to the instrument
- The Gain (negative for a loss) of the cable between instrument and RF Matrix.

This section provides the means to identify and measure the separate influences associated with the path between the User Terminal antenna connector and the measuring instrument.

5.1.4 UT-Specific XMT Test Adapter Calibration

5.1.4.1 The UT Test Adapter has a cable that mates with the UT Transmit connector on one end and a standard SMA Female to N Female adapter/connector on the other. It may also have an in-line attenuator with SMA connector. Remove the N to SMA adapter and Attenuator, a/r, and set them aside.

5.1.4.2 To perform this calibration, use a cable of exactly the same type and length as the Test Adapter cable, with the same SMA type connector on one end, and a mating connector of the type on the Test Adapter Cable connecting to the UT, on the other end. When connected together using the UT mating connectors, these 2 cables will provide a joined length of cable with same sex SMA connectors at both ends.

5.1.4.3 Obtain another cable of the same type as the Test Adapter Cable with SMA connectors of the same sex, and exactly the same total length + .05" as the combined cables above, but without the UT mating connectors.

5.1.4.4 Connect the signal generator to the Splitter Box. Set the signal generator level to produce an output power level of 0 dBm + 1 dB @ 1.62 GHz per the Gigatronix Power Meter. Run the full set of frequencies as in Calibration step #1, recording the difference (A-B) between the power heads as A'.

5.1.4.5 Connect the single piece cable through N to SMA adapters between the A output of the Splitter Box and the Power Meter Power Head A.

5.1.4.6 Run the full set of frequency steps logging the reading on the A & B power heads, and subtracting them from the values in the array for A', and temporarily store this one-dimensional array of values as X (=B+A'-A).

5.1.4.7 Replace the single piece cable and SMA connectors at the N adapters, with the combination Test Adapter cable and run the frequency steps again taking the readings at A & B (=B+A'-A) and storing as a Y array.

5.1.4.8 If an attenuator is used in the Test Adapter Cable, reconnect the attenuator in the cable as required, restoring all adapters. Run the full set of frequency steps again, and take ther A & B power readings again and store as the Z array (=B+A'-A). Subtract the Z array from the Y array and replace the resultant values in the Z array. Otherwise, skip this step.

5.1.4.9 Subtract the Y array from the X array and divide the result of each element by 2 and replace in the Y array.

5.1.4.10 Divide the elements in the X array by 2 and replace in the X array.

5.1.4.11 Add the X, Y, and Z(if applicable) arrays together and replace element by element in the X array. Discard the A',Y, and Z arrays. The X array will be the table of insertion loss values for the Test Adapter. This value shall be added to the other calibration values set up for the various paths in the RF matrix, as required when making measurement.

[1] **5.1.5 RF Matrix Calibration:**

5.1.5.1 Set up Reference Frequency and Power Source

5.1.5.1.1 Use the Splitter Calibration Box with the Frequency Source connected to it with a flexible cable.
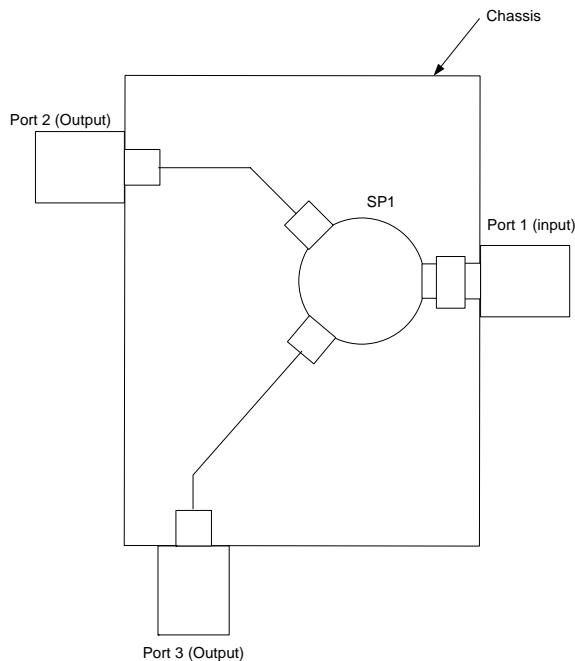
Figure 5-2 Calibration Splitter Box

5.1.5.1.2 The "B" power meter head should always be attached to the "B" N connector (bottom) of the Splitter Box. Once started, do not disconnect or re-torque this power head from the Splitter Box during calibration. Otherwise calibration shall have to be begun again.
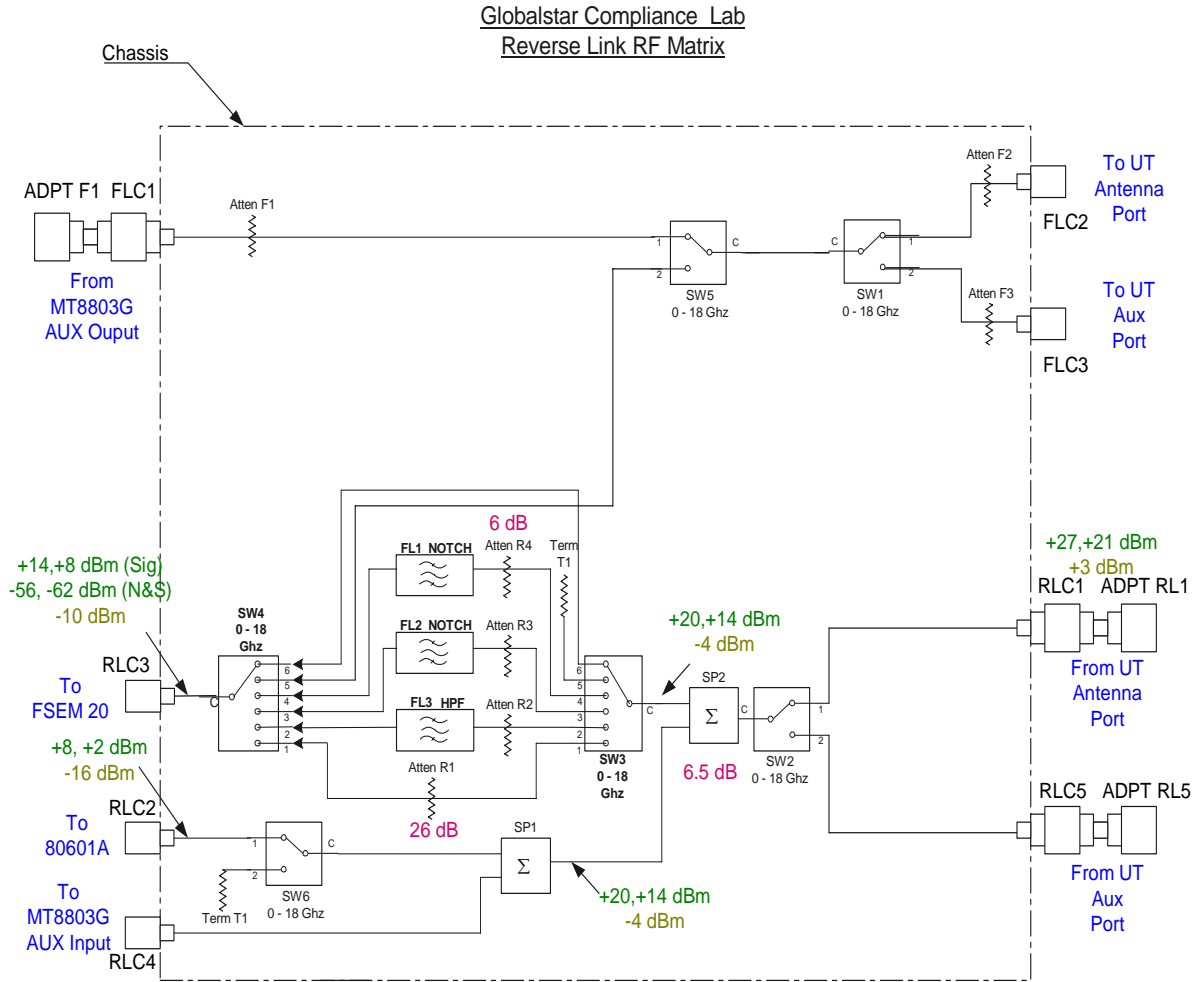
Figure 5-3 Reverse Link RF Matrix

5.1.5.1.3 Do not use adapters except as provided for by this procedure or by the design of the tester.

5.1.5.1.4 Before starting, ensure all associated instrumentation is connected to the RF connectors on the RF Matrix. In the case of the Spectrum Analyzer, temporarily connect a 50 dB precision attenuator between RLC3 and the Spectrum Analyzer input connector.

5.1.5.1.5 Frequency Span of Spectrum Analyzer must be set to 20% more than span of lowest and highest frequency in the sweep range.

5.1.5.1.6 When performing calibration steps, with the CW signal Generator set "Number of Averages" to 4 on the Spectrum Analyzer when using "Average" Mode detection. Allow for time to take the 4 averages before logging the level. For actual measurements, unless specified in the particular test step, use a minimum of 50 averages.

5.1.5.1.7 Set Spectrum Analyzer Attenuator to Zero for all calibrations and measurements.

5.1.5.1.8 Loss Values are expressed as algebraically positive numbers.

5.1.5.2 Receive Path Reference Power Level

5.1.5.2.1 With the Signal Generator and Power Meter A and B Power Heads connected to the Splitter Box, step the Signal Generator over the entire range of In-Band and Out of Band frequencies, according to the frequency table, at +10 dBm (into the splitter). Record the results as A' (=A-B).

5.1.5.3 RF Matrix Receive Path FLC1/FLC2/3 CW Path Loss

5.1.5.3.1 Disconnect Power Head A from the Splitter Box and reconnect to FLC2. Connect the Splitter Box A' output to FLC1 through adapter ADPT F1.

5.1.5.3.2 With RF Matrix SW5 and SW1 in the FLC2 path position, again step the Frequency Generator over the range of frequencies and record these values as FLC1/FLC2 Path Loss by taking the reading for B Power Head and adding it to the corresponding reading for A', then subtracting the corresponding reading for Power Head A. Formula: FLC1/FLC2 Path Loss = $(B_{reading} + (A'_{recorded})) - A_{reading}$.

5.1.5.3.3 Disconnect Power Head A from FLC2 and connect to FLC3. Repeat 5.1.5.3.2 for path FLC1/FLC3, and recording the Path Loss data.

5.1.5.3.4 Disconnect the Power Head A from FLC3.

5.1.5.4 RF Matrix Receive Path FLC2/RLC3 CW Path Loss

5.1.5.4.1 Set RF Matrix SW5 to position 2, SW1 to FLC2, and SW4 to Position 5.

5.1.5.4.2 Temporarily install an N Male to N Male adapter on FLC2. Attach the Splitter Box A' output to the adapter.

5.1.5.4.3 For each frequency band in the table, set the Spectrum Analyzer Range, RBW, VBW, and detector method, and frequency step the corresponding frequency range using the Signal Generator.

5.1.5.4.4 Record the FLC2/RLC3 Noise and Spurious Path Loss value for each frequency step by sutracting the measured value on the Spectrum Analyzer form the value fo A' for the corresponding frequency. Formula: FLC2/RLC3 (N&S) Path Loss = $(B_{reading}+(A'_{recorded})$ - $Sa_{reading})$.

5.1.5.4.5 Repeat 5.1.5.4.1 for path FLC3/RLC3.

5.1.5.4.6 Remove the Splitter Box and N to N Male Adapter.

5.1.5.5 Transmit Path Reference Power Level

5.1.5.5.1 With the Signal Generator and the Power Meter A and B power heads connected to the Calibration Splitter Box, step the Signal Generator frequency over the entire range of In-Band and Out of Band Frequencies at +10 dBm (into the splitter).

5.1.5.5.2 Record the results as A' (=A-B).

5.1.5.6 RF Matrix RLC1/RLC2 CW Path Loss

5.1.5.6.1 Disconnect Power Head A from the Splitter Box and reconnect to RLC2.

5.1.5.6.2 Connect the Splitter Box A' output to RLC1 ADPT RL1.

5.1.5.6.3 With RF Matrix SW2 in the RLC1 Input path position, again step the Frequency Generator over the range of frequencies and record these values as RLC1/RLC2 Path Loss by taking the reading for B power head and adding it to the corresponding reading for A', then subtracting the corresponding reading for Power Head A. Formula: RLC1/RLC2 Path Loss = $(B_{reading}+(A')_{recorded})$-$A_{reading}$.

5.1.5.7 RF Matrix RLC1/RLC3 Noise and Spurious Path Loss

5.1.5.7.1 If not already in place, connect a 50 dB precision attenuator between RLC3 and the Spectrum Analyzer input connector cable.

5.1.5.7.2 For each required Band in TBR 041 table 2, set the Spectrum Analyzer Range, RBW, VBW, and detector method and frequency step the corresponding frequency range using the Signal Generator.

5.1.5.7.3 Record the RLC1/RLC3 Noise and Spurious Path Loss value for each frequency step by subtracting the measured value on the Spectrum Analyzer from the value of A' for the corresponding frequency. Formula: RLC1/RLC3 (N&S) Path Loss = $(B_{reading}+(A')_{recorded})$-$SA_{reading}$.

5.1.5.7.4 Frequencies from .1 MHz to 1610 MHz should be recorded for both the FL1 and FL2 Notch Filter Paths.

5.1.5.7.5 Frequencies greater than 1628.5 should use the path with the High Pass Filter.

5.1.5.8 RF Matrix RLC1/RLC3 Thru Path Loss

5.1.5.8.1 Disconnect the 50 dB precision attenuator between RLC3 and the Spectrum Analyzer and reconnect the input connector cable to the RF Matrix N connector.

5.1.5.8.2 Set the RLC1/RLC3 path switches to the Normal thru path setting. Set the Spectrum Analyzer Reference level to –10 dBm, RBW = 1 MHz, VBW = 3 MHz, and detector Method to RMS.

5.1.5.8.3 Step the Signal Generator for frequecies 1610 to 1628.5 MHz, and record the RLC1/RLC3 Thru Path Loss value for each frequency step by subtracting the measured power value read on the Spectrum Analyzer from the value of A' for the corresponding frequency. Formula: RLC1/RLC3 (Thru) Path Loss = $(B_{reading}+(A')_{recorded})-SA_{reading}$.

5.1.5.9 RF Matrix RLC1/RLC3 CDMA Path Loss

5.1.5.9.1 Set the RLC1/RLC3 path switches to the Normal thru path setting. Set the Spectrum Analyzer Reference level to –10 dBm, RBW = 1 MHz, VBW = 3 MHz, and detector Method to RMS.

5.1.5.9.2 Replace the Signal Generator and Splitter with a Portable G* UT at Maximum Power (27dBm) and no attenuator.

5.1.5.9.3 Make a call through the 8803 to the UT. Frequency step the corresponding frequency range using the G* UT channel settings set from the Anritsu 8803.

5.1.5.9.4 Record the value read on the Spectrum Analyzer (adjusted for 1.23 MHz BW) for path RLC1/RLC3 CDMA Path. At the same time, record the value read on the Power Meter A Channel.

5.1.5.9.5 Subtract the power values read on the frequency steps read on the Spectrum Analyzer from those read for the Power Meter, add the value of the RLC1/RLC3 Thru Path Loss and subtract the value of the RLC1/RLC2 CW Path Loss from the Total. Add this set of values algebraically to the RLC1/RLC3 Thru Path Loss table, creating the RLC1/RLC3 CDMA Path Loss table.

5.1.5.9.6 Formula: RLC1/RLC3 (CDMA) Path Loss = (RLC1/RLC3 (Thru) Path Loss) + $A_{reading}$ - $A_{ThruPLrecorded}$ - $SA_{reading}$ - $SA_{ThruPLrecorded}$.

5.1.5.9.7 Note: This step should be performed simultaneous with step 6.

5.1.5.10 RF Matrix RLC1/RLC4 CDMA Path Loss

5.1.5.10.1 Record the the RLC1/RLC4 CDMA Path Loss value for each frequency step by subtracting the measured value on the 8803 "DSP Power Meter" line from the value of the Power Meter A channel for the corresponding frequency.

5.1.5.10.2 Formula: RLC1/RLC2 (CDMA) Path Loss = $A_{reading}$+ RLC1/RLC2 CW Path Loss $_{recorded}$) - $8803_{reading}$.

5.2 Appendix B: Test Equipment Setup Defaults

5.2.1 Anritsu MT8803G Globalstar User Terminal Tester

5.2.1.1 Call Model = TIA or ETSI, as determined by the UT Type

5.2.1.2 Reference Output Power = -75.0 dBm/1.23 MHz

5.2.1.3 Beam 1 Power = 0

5.2.1.4 Beam 2 Power = 0

5.2.1.5 Measurement Reference Level = 10 dBm

5.2.1.6 Default Foreward Link Set up Values;

Table 5-1 List of Forward Channel Power Levels

Parameter	Units	Channel
$\hat{I}_{or}/I_{oc}$	dB	-1.8
Pilot E_c/I_{or}	dB	-16.0
OCNS E_c/I_{or}	dB	-0.4772
Sync E_c/I_{or}	dB	-12.0
Paging E_c/I_{or}	dB	-18.0
Conducted I_{oc}	dBm/1.23 MHz	-95.0
Radiated I_{oc}	dBm/1.23 MHz	-105.0
Paging E_b/N_t	dB	10.2
Pilot E_c/I_o	dB	-20.0

5.2.1.7 Reverse Link Frequency = 1618.11 GHz (Channel 9)

5.2.1.8 Forward Link Frequency = (Channel 9)

5.2.1.9 Call Mode = SO2001 Loopback

5.2.1.10 BPS = All 1's, 9600 bps

5.2.1.11 Reverse Link Power Control = "All Zeros"

5.2.1.12 Frame Offset = 15

5.2.1.13 Satellite ID = 1

5.2.1.14 MAX_REQ_SEQ = 3

5.2.1.15 MAX_RSP_SEQ = 3

1 **5.2.2 Rhode Schwarz FSEM 20 Spectrum Analyzer**

5.2.2.1 Mode = Spectrum Analyzer

5.2.2.2 Attenuator = 0 dB

5.2.2.3 Reference Level = -10 dBm

5.2.2.4 Span = 2 MHz (Frequency Span of Spectrum Analyzer must be set typically 15% greater than the difference of the lowest and highest frequency in the sweep range of interest.)

5.2.2.5 Center Frequency = 1618.11 MHz (TX channel 9)

5.2.2.6 Sweep Time = Auto

5.2.2.7 RBW = 30 KHz

5.2.2.8 VBW = 30 KHz

5.2.2.9 Detector = Peak

5.2.2.10 Method = Average

5.2.2.11 # of Averages = 5

5.2.2.12 Free Run

2 **5.2.3 Gigatronix Power Meter**

5.2.3.1 Display; Upper = A, Lower = B

5.2.3.2 Detector = Modulation

5.2.3.3 Method = Absolute

5.2.3.4 Offset = 0

5.2.3.5 Frequency = Frequency of Interest

[1] **5.2.4 Qualcomm RF Matrix**

5.2.4.1 SW 1 to "FLC2"

5.2.4.2 SW2 to "RLC1"

5.2.4.3 SW3/4 to "THRU; 26 dBm" (position 1).

5.2.4.4 SW5 to "FLC1"

1   No Text

1   No Text

1   # 6. Test Conditions

2   The following table describes the conditions under which each test must be run. For
3   every "X" in the table the full test sequence for each of the required frequencies and
4   applicable rates must be repeated.

5   *Table 6-1 List of Test Conditions*

Spec. Ref.	Test Paragraph		Temperature			Voltage		
			Low	Mid*	High	Low	Mid	High
80-70129-1, 3.3.2	4.10	Waveform Quality and Frequency Accuracy	X	X	X	X		X
ETSI TBR 041, sec. 10.	4.11	Equipment Identity		X			X	
ETSI TBR 041, sec. 9.3.1	4.12	Network Control -- Authorization		X			X	
ETSI TBR 041, sec. 9.3.2	4.13	Network Control -- Transmission Enable/Disable		X			X	
80-70129-1, 2.1.	4.14	Rx Frequency Requirements		X		X		X
80-70129-1, 2.2.1.	4.15	Satellite and Beam Acquisition Performance		X		X		X
80-70129-1, 3.4.3	4.16	Maximum Channel Power (EIRP Density)	X	X	X	X		X
80-70129-1, 3.5.1, 3.5.1.3.4	4.17	TX Out of Band Noise and Spurious Emissions -- ETSI	X	X	X	X		X
FCC part 25, Section 25.202	4.18	TX Out of Band Noise and Spurious Emissions – FCC Part 25	X	X	X	X		X
80-70129-1, 3.5.1.3.1 ETSI TBR 041, sec. 6	4.19	TX In-Band Noise and Spurious Emissions	X	X	X	X		X
FCC part 25, Section	4.20	RX Conducted Noise and Spurious Emissions -- FCC	X	X	X	X		X

25.202		Part 25						
80-70129-1, 3.4.4	4.2	Access Probe Power Time Response	X	X	X	X		X
80-70129-1, 2.6.1 ETSI TBR 041, sec. 5	4.21	RX Conducted Noise and Spurious Emissions -- Out of Band	X	X	X	X		X
ETSI TBR 041 sec. 8.0	4.22	Unwanted Emissions in Carrier-Off State -- ETSI	X	X	X	X		X
80-70129-1, 2.7	4.23	Paging Channel Supervision		X		X		X
80-70129-1, 2.7	4.24	Traffic Channel Supervision		X		X		X
80-70129-1, 3.4.1	4.25	Range of Closed Loop Power Control	X	X	X	X		X
80-70129-1, 3.3.2	4.3	Access Channel Waveform Quality, Timing, and Frequency Accuracy	X	X	X	X		X
80-70129-1, 3.4.6	4.4	Minimum Controlled Output Power	X	X	X	X		X
80-70129-1, 3.4.3, & (p/o) 3.4.7	4.5	Access Probe Output Power and Standby Output Power	X	X	X	X		X
80-70129-1, 3.4.2.	4.6	Initial Transmission Power	X	X	X	X		X
80-70129-1, 3.4.8	4.7	Change of Reverse Traffic Output Power with Change of Rate	X	X	X	X		X
80-70129-1, p/o 3.4.7	4.8	Gated Output Power		X		X		X
80-70129-1, 3.3.1.4	4.9	Traffic Channel Timing		X		X		X
* Mid temperature shall be the Standard Environmental Test Conditions of Section 5.2 ** Temperature and Voltage Requirements of regulatory documents supercede these requirements.								

1