

**Nemko Test Report:** 1L0199RUS1

**Applicant:** GTRAN, Inc.  
12071 Tejon St. Suite 450  
Westminster, CO 80234

**Equipment Under Test:  
(E.U.T.)** GPC-3000

**FCC ID:** PL5GCP-3000

**In Accordance With:** **FCC Part 22, Subpart H**  
800 MHz Cellular Subscriber Units

**Tested By:** Nemko Dallas Inc.  
802 N. Kealy  
Lewisville, TX  
75057-3136

**Authorized By:** 

Tom Tidwell, RF Group Manager

**Date:** 6/7/01

**Total Number of Pages:** 35

**Table of Contents**

Section 1. Summary of Test Results ..... 3

Section 2. General Equipment Specification..... 5

Section 3. RF Power Output..... 7

Section 4. Occupied Bandwidth..... 8

Section 5. Spurious Emissions at Antenna Terminals ..... 10

Section 7. Frequency Stability ..... 19

Section 8. Test Equipment List..... 21

ANNEX A - TEST DETAILS ..... 22

ANNEX B - TEST DIAGRAMS ..... 32

## Section 1. Summary of Test Results

Manufacturer: GTRAN, Inc.

Model No.: GPC-3000

Serial No.: None

General: **All measurements are traceable to national standards.**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 22, Subpart H.



New Submission



Production Unit



Class II Permissive Change



Pre-Production Unit

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.

See “ Summary of Test Data”.



**NVLAP LAB CODE: 100426-0**

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**Summary Of Test Data**

| NAME OF TEST                            | PARA.<br>NO. | SPEC.         | MEAS.     | RESULT   |
|---|--------------|---------------|-----------|----------|
| RF Power Output                         | 2.1046       | 7W ERP        | < 7W ERP  | Complies |
| Audio Frequency Response                | 2.1047       | 6dB/Octave    | N/A       | N/A      |
| Audio Low Pass Filter Response          | 2.1047       | Graph         | N/A       | N/A      |
| Modulation Limiting                     | 2.1047       | Graph         | N/A       | N/A      |
| Occupied Bandwidth (Voice & SAT)        | 2.1049       | Mask          | N/A       | N/A      |
| Occupies Bandwidth (WB Data & SAT)      | 2.1049       | Mask          | N/A       | N/A      |
| Occupied Bandwidth (ST)                 | 2.1049       | Mask          | N/A       | N/A      |
| Occupied Bandwidth (SAT)                | 2.1049       | Mask          | N/A       | N/A      |
| Occupied Bandwidth (Digital)            | 2.1049       | Not Specified | Plot      | Complies |
| Spurious Emissions at Antenna Terminals | 2.1051       | -13 dBm       | < -13 dBm | Complies |
| Field Strength of Spurious Emissions    | 2.1053       | -13 dBm       | < -13 dBm | Complies |
| Frequency Stability                     | 2.1055       | 2.5 ppm       | < 2.5 ppm | Complies |

**Footnotes:** The device transmits CDMA signals only.

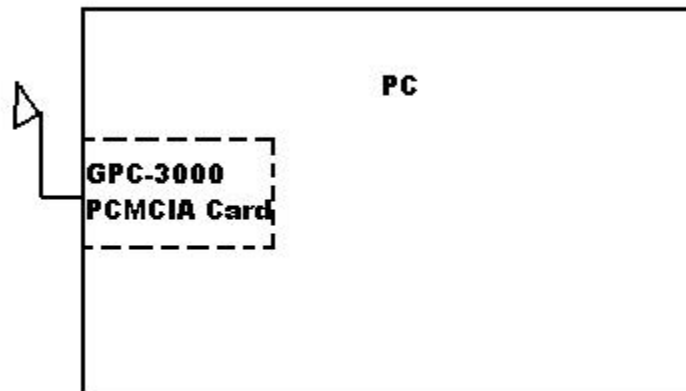
## **Section 2.           General Equipment Specification**

|  |                     |
|--|---------------------|
| <b>Frequency Range:</b>                    | 824.7-848.31 MHz    |
| <b>Necessary Bandwidth:</b>                | 1.23 MHz            |
| <b>Type of Modulation and Designator:</b>  | 1M25F9D             |
| <b>Output Impedance:</b>                   | 50 ohms             |
| <b>RF Power Output (rated):</b>            | 355 mW (25.5 dBm)   |
| <b>Duty Cycle:</b>                         | Continuous          |
| <b>Channel Spacing:</b>                    | 1.25 MHz            |
| <b>Operator Selection of Frequency:</b>    | Software Controlled |
| <b>Power Output Adjustment Capability:</b> | Software Controlled |

## **Operational Description**

GTRAN DotSurfer GPC-3000 PCMCIA Card is high-speed Wireless Modem.

## **System Diagram**



### **Section 3. RF Power Output**

|                               |                   |
|-------------------------------|-------------------|
| NAME OF TEST: RF Power Output | PARA. NO.: 2.1046 |
| TESTED BY: David Light        | DATE: 5/21/2001   |

**Test Results:** Complies.

**Measurement Data:**

| Channel | Output Power<br>(dBm) | Rated Power<br>(dBm) |
|---------|-----------------------|----------------------|
| 1013    | 25.5                  | 25.5                 |
| 384     | 25.5                  | 25.5                 |
| 777     | 25.5                  | 25.5                 |
|         |                       |                      |
|         |                       |                      |
|         |                       |                      |
|         |                       |                      |

**Equipment Used:** 1036-1469-1046

**Measurement Uncertainty:** 1.7 dB

**Temperature:** 22 °C

**Relative Humidity:** 50 %

## **Section 4. Occupied Bandwidth**

|  |                   |
|--|-------------------|
| NAME OF TEST: Occupied Bandwidth<br>(Digital Modulation) | PARA. NO.: 2.1047 |
| TESTED BY: David Light                                   | DATE:5/22/2001    |

**Test Results:** Complies.

**Measurement Data:** See attached graph.

**Equipment Used:** 1036-1046-1469

**Measurement Uncertainty:** 1.7 dB  
1 X 10<sup>-7</sup> ppm

**Temperature:** 22 °C

**Relative Humidity:** 50 %



## Test Data – Occupied Bandwidth – Digital Modulation



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Fax: (972) 436-2667

## Data Plot

Page 1 of 1

Job No.: 1L0199R

Date: 5/22/01

Complete X

Specification: IS-95

Temperature(°C): 22

Preliminary \_\_\_\_\_

Tested By: David Light

Relative Humidity(%) 50

E.U.T.: GPC-3000

Configuration: TRANSMIT FULL POWER

Sample Number: S01

Location: Lab 2

RBW: 30 kHz

Measurement

Detector Type: Rms

VBW: 300 kHz

Distance: N/A m

## Test Equipment Used

Antenna: \_\_\_\_\_

Directional Coupler: \_\_\_\_\_

Pre-Amp: \_\_\_\_\_

Cable #1: 1046

Filter: \_\_\_\_\_

Cable #2: \_\_\_\_\_

Receiver: 1036

Cable #3: \_\_\_\_\_

Attenuator #1: 1469

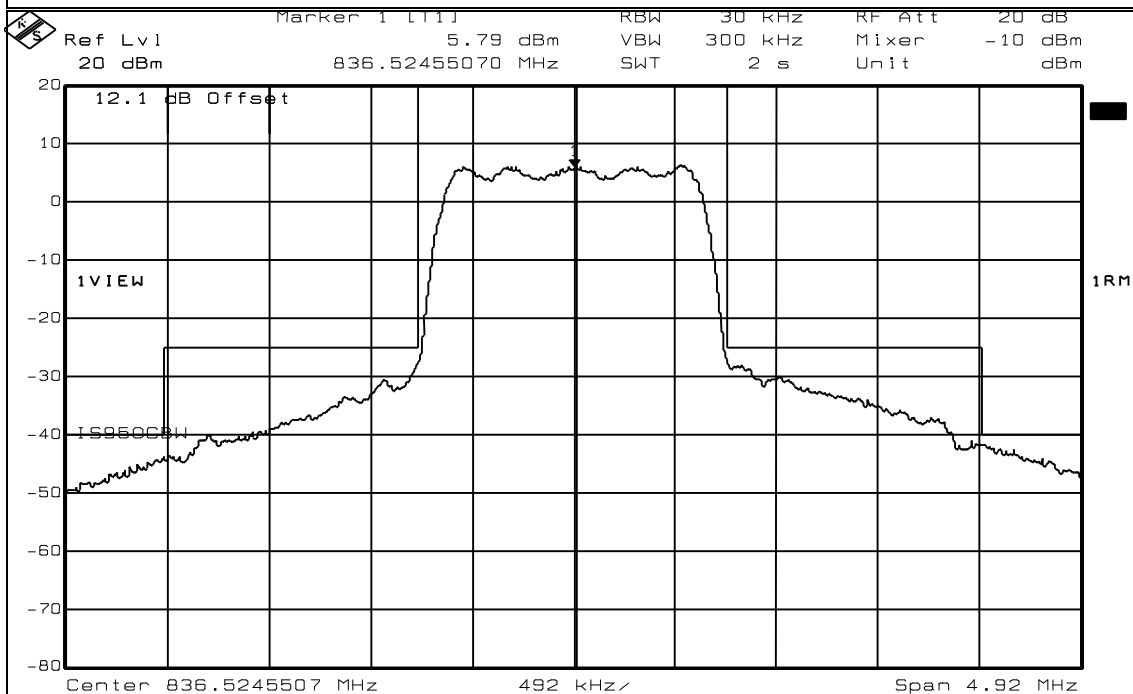
Cable #4: \_\_\_\_\_

Attenuator #2: \_\_\_\_\_

Mixer: \_\_\_\_\_

Additional equipment used: \_\_\_\_\_

Measurement Uncertainty: +/-3.6 dB



Date: 22.MAY.2001 13:17:12

Notes:

## **Section 5. Spurious Emissions at Antenna Terminals**

|   |                   |
|---|-------------------|
| NAME OF TEST: Spurious Emissions At Antenna Terminals | PARA. NO.: 2.1051 |
| TESTED BY: David Light                                | DATE:5/21/2001    |

**Test Results:** Complies.

**Measurement Data:** See attached graph.

**Equipment Used:** 1036-1046-1469

**Measurement Uncertainty:** 1.7 dB  
1 X 10<sup>-7</sup> ppm

**Temperature:** 22 °C

**Relative Humidity:** 50 %

**Nemko Dallas, Inc.**

FCC PART 22, SUBPART H  
800 MHz CELLULAR SUBSCRIBER  
UNITS

*EQUIPMENT:GPC-3000*

PROJECT NO.: 1L0199RUS1

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**Test Data – Spurious Emissions at Antenna Terminals**

EQUIPMENT: GPC-3000

PROJECT NO.: 1L0199RUS1



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**Data Plot Bandedges**

Page 1 of 2

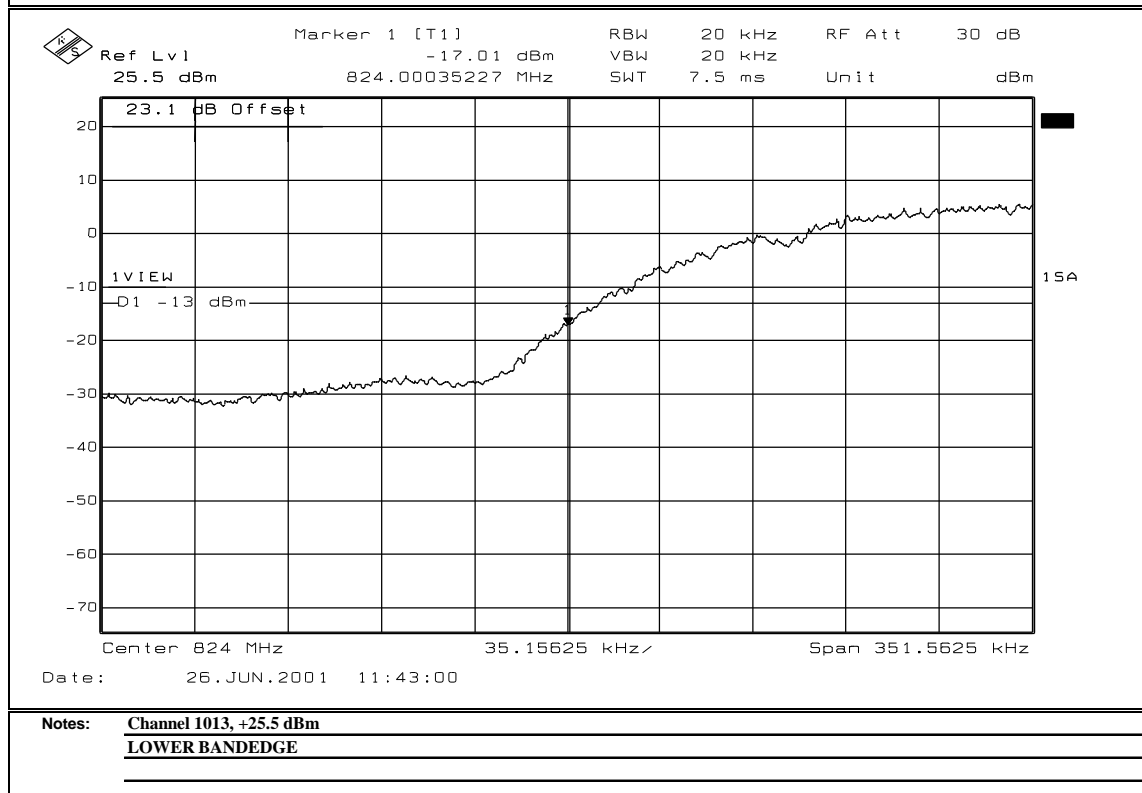
Job No.: 1L0155R Date: 6/26/01  
Specification: PART 22 Temperature(°C): 22  
Tested By: David Light Relative Humidity(%) 50  
E.U.T.: GPC-3000 (DOT SURFER)  
Configuration: TRANSMIT CDMA MID-BAND  
Sample Number: S01  
Location: Lab 1 RBW: Refer to plots  
Detector Type: Peak VBW: Refer to plots

Complete X  
Preliminary       

Measurement  
Distance: N/A m

**Test Equipment Used**

Antenna: \_\_\_\_\_ Directional Coupler: \_\_\_\_\_  
Pre-Amp: \_\_\_\_\_ Cable #1: 1046  
Filter: \_\_\_\_\_ Cable #2: \_\_\_\_\_  
Receiver: 1036 Cable #3: \_\_\_\_\_  
Attenuator #1: 1469 Cable #4: \_\_\_\_\_  
Attenuator #2: \_\_\_\_\_ Mixer: \_\_\_\_\_  
Additional equipment used: \_\_\_\_\_  
Measurement Uncertainty: +/-1.7 dB



## Test Data – Spurious Emissions at Antenna Terminals



## Dallas Headquarters:

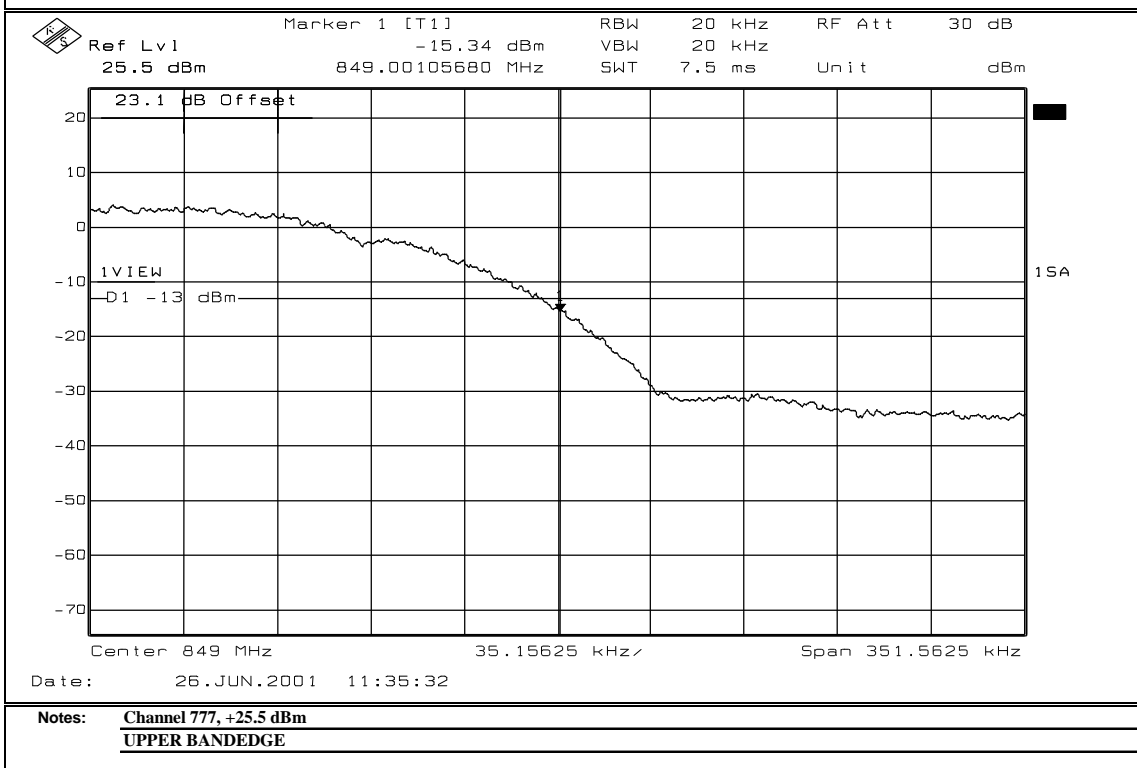
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Nemko Dallas, Inc.

**Data Plot Bandedges**

Page 2 of 2

Job No.: 1L0155R Date: 6/26/01  
Specification: PART 22 Temperature(°C): 22  
Tested By: David Light Relative Humidity(%) 50  
E.U.T.: GPC-3000 (DOT SURFER)  
Configuration: TRANSMIT CDMA MID-BAND



## Test Data – Spurious Emissions at Antenna Terminals



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## Data Plot Antenna Port Spurious Emissions

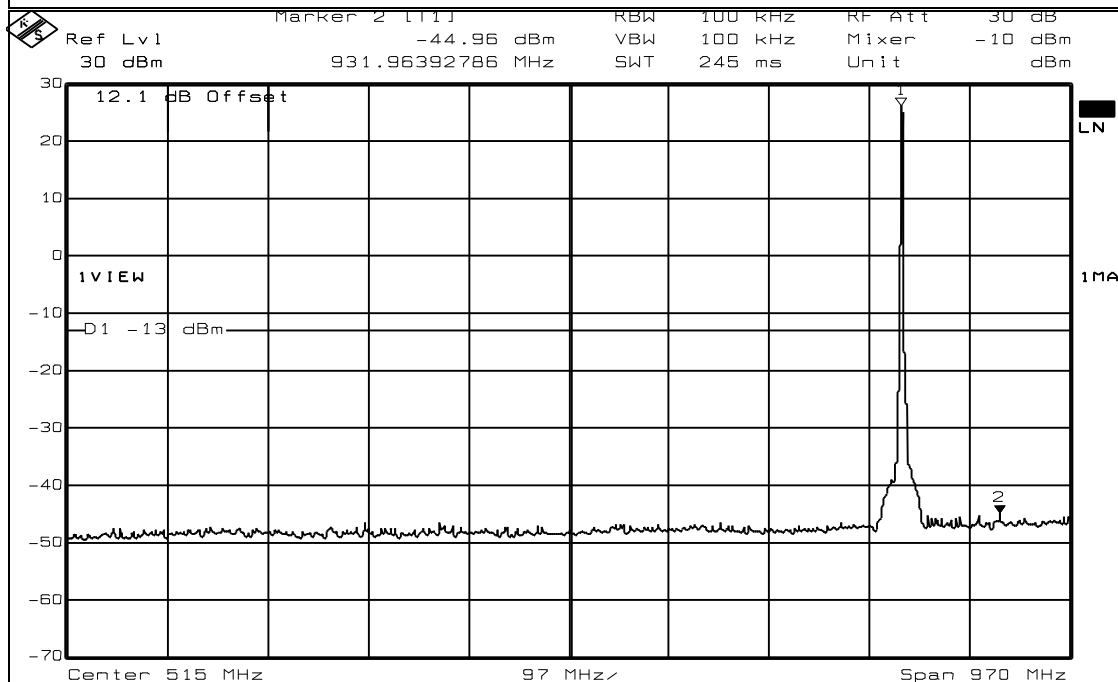
Page 1 of 2

Job No.: 1L0155R Date: 5/21/01 Complete X  
Preliminary \_\_\_\_\_

Specification: PART 22 Temperature(°C): 22  
Tested By: David Light Relative Humidity(%) 50  
E.U.T.: GPC-3000 (DOT SURFER)  
Configuration: TRANSMIT CDMA MID-BAND  
Sample Number: S01  
Location: Lab 1 RBW: Refer to plots Measurement  
Detector Type: Peak VBW: Refer to plots Distance: N/A m

## Test Equipment Used

Antenna: \_\_\_\_\_ Directional Coupler: \_\_\_\_\_  
Pre-Amp: \_\_\_\_\_ Cable #1: 1046  
Filter: \_\_\_\_\_ Cable #2: \_\_\_\_\_  
Receiver: 1036 Cable #3: \_\_\_\_\_  
Attenuator #1: 1469 Cable #4: \_\_\_\_\_  
Attenuator #2: \_\_\_\_\_ Mixer: \_\_\_\_\_  
Additional equipment used: \_\_\_\_\_  
Measurement Uncertainty: +/-3.6 dB



Date: 21.MAY.2001 12:14:07

Notes: TRANSMIT FULL POWER CDMA SIGNAL AT MID-BAND  
MARKER 1 INDICATES CARRIER  
MARKER 2 INDICATES HIGHEST EMISSION (NOISE FLOOR)

Test Data – Spurious Emissions at Antenna Terminals



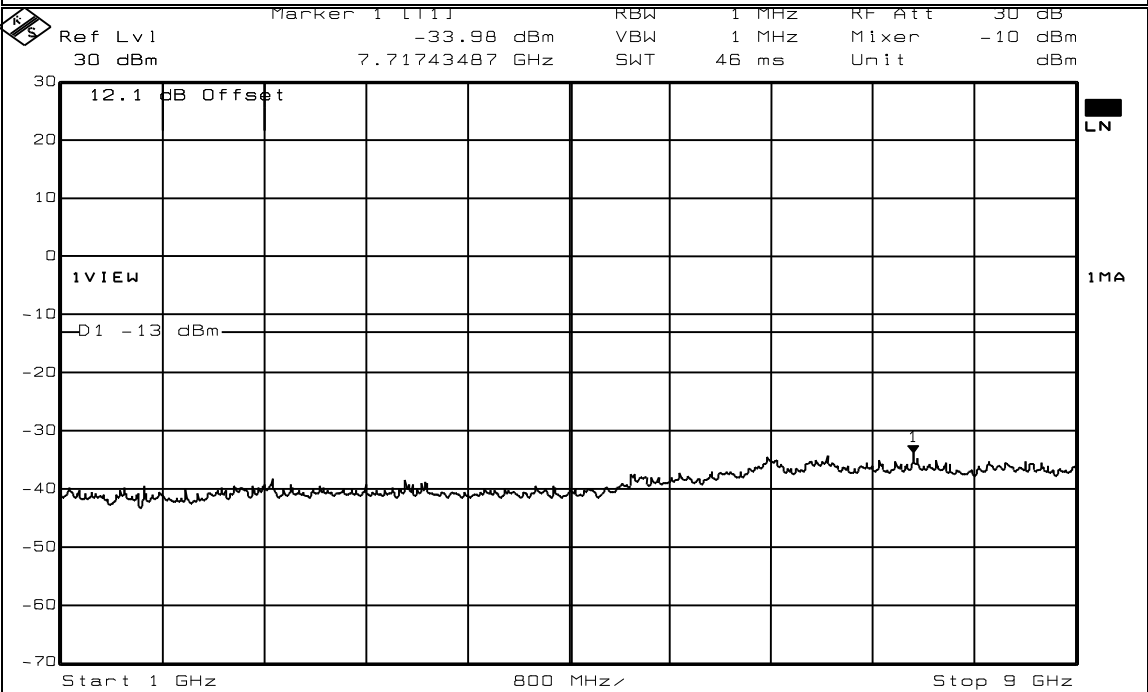
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Data Plot Antenna Port Spurious Emissions

Page 2 of 2

Job No.: 1L0155R Date: 5/21/01  
Specification: PART 22 Temperature(°C): 22  
Tested By: David Light Relative Humidity(%) 50  
E.U.T.: GPC-3000 (DOT SURFER)  
Configuration: TRANSMIT CDMA MID-BAND



Date: 21.MAY.2001 12:15:22

Notes: TRANSMIT FULL POWER CDMA SIGNAL AT MID-BAND  
MARKER INDICATES HIGHEST EMISSION (NOISE FLOOR)

**Section 6. Field Strength of Spurious**

|  |                   |
|--|-------------------|
| NAME OF TEST: Field Strength of Spurious | PARA. NO.: 2.1053 |
| TESTED BY: David Light                   | DATE:5/22/2001    |

**Test Results:** Complies.

**Measurement Data:** See attached table.

**Equipment Used:** 1036-1016-1481-1484-1485

**Measurement Uncertainty:** 1.7 dB

**Temperature:** 22 °C

**Relative Humidity:** 50 %



EQUIPMENT: GPC-3000

PROJECT NO.: 1L0199RUS1

## Test Data – Field Strength of Spurious Emissions



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## Field Strength of Spurious Emissions

Page 1 of 1

Job No.: 1L0199R Date: 5/22/01 Complete X  
Preliminary \_\_\_\_\_

Specification: Part 22 Temperature(°C): 22  
Tested By: David Light Relative Humidity(%) 50  
E.U.T.: GPC-3000

Configuration: Transmit full power  
Sample No: S01  
Location: AC 3 RBW: 1 MHz Measurement  
Detector Type: Peak VBW: 1 MHz Distance: 3 m

**Test Equipment Used**

Antenna: \_\_\_\_\_ Directional Coupler: \_\_\_\_\_  
Pre-Amp: 1016 Cable #1: 1484  
Filter: 1481 Cable #2: 1485  
Receiver: 1036 Cable #3: \_\_\_\_\_  
Attenuator #1: \_\_\_\_\_ Cable #4: \_\_\_\_\_  
Attenuator #2: \_\_\_\_\_ Mixer: \_\_\_\_\_

Additional equipment used: \_\_\_\_\_  
Measurement Uncertainty: +/-3.6 dB

| Frequency<br>(MHz) | Meter<br>Reading<br>(dBm) | Correction<br>Factor<br>(dB) |  | Pre-Amp<br>Gain<br>(dB) | Substitution<br>Antenna Gain<br>(dBd) | Limit<br>(dBm) | ERP<br>(dBm) | ERP<br>(mW) | Polarity | Comments    |
|--------------------|---------------------------|------------------------------|--|-------------------------|---------------------------------------|----------------|--------------|-------------|----------|-------------|
| 1673               | -69.2                     | 29.9                         |  | 0                       | 6.4                                   | -13            | -33.0        | 0.000501    | V        |             |
| 2509               | -52.0                     | 35.6                         |  | 33.3                    | 8.0                                   | -13            | -41.8        | 0.000067    | V        |             |
| 3436               | -62.8                     | 37.1                         |  | 33.6                    | 8.1                                   | -13            | -51.2        | 0.000008    | V        | Noise floor |
| 4183               | -57.1                     | 42.8                         |  | 33.4                    | 7.9                                   | -13            | -39.8        | 0.000105    | V        |             |
| 5019               | -65.0                     | 40.6                         |  | 32.8                    | 9.1                                   | -13            | -48.1        | 0.000015    | V        | Noise floor |
| 5856               | -65.0                     | 38.5                         |  | 32.5                    | 9.1                                   | -13            | -49.9        | 0.000010    | V        | Noise floor |
| 6692               | -65.0                     | 38.3                         |  | 32.7                    | 10.1                                  | -13            | -49.3        | 0.000012    | V        | Noise floor |
| 7529               | -66.0                     | 40.4                         |  | 33                      | 9.4                                   | -13            | -49.1        | 0.000012    | V        | Noise floor |
| 8365               | -66.0                     | 41.6                         |  | 33.7                    | 9.7                                   | -13            | -48.4        | 0.000015    | V        | Noise floor |
| 1673               | -64.3                     | 32.7                         |  | 0                       | 6.4                                   | -13            | -25.3        | 0.002979    | H        |             |
| 2509               | -57.6                     | 34.6                         |  | 33.3                    | 8.0                                   | -13            | -48.3        | 0.000015    | H        |             |
| 3436               | -62.8                     | 35.8                         |  | 33.6                    | 8.1                                   | -13            | -52.5        | 0.000006    | H        | Noise floor |
| 4183               | -63.5                     | 35.2                         |  | 33.4                    | 7.9                                   | -13            | -53.8        | 0.000004    | H        | Noise floor |
| 5019               | -65.0                     | 36.3                         |  | 32.8                    | 9.1                                   | -13            | -52.5        | 0.000006    | H        | Noise floor |
| 5856               | -65.0                     | 36.0                         |  | 32.5                    | 9.1                                   | -13            | -52.4        | 0.000006    | H        | Noise floor |
| 6692               | -65.0                     | 37.8                         |  | 32.7                    | 10.1                                  | -13            | -49.7        | 0.000011    | H        | Noise floor |
| 7529               | -66.0                     | 39.8                         |  | 33                      | 9.4                                   | -13            | -49.8        | 0.000011    | H        | Noise floor |
| 8365               | -66.0                     | 42.2                         |  | 33.7                    | 9.7                                   | -13            | -47.8        | 0.000017    | H        | Noise floor |

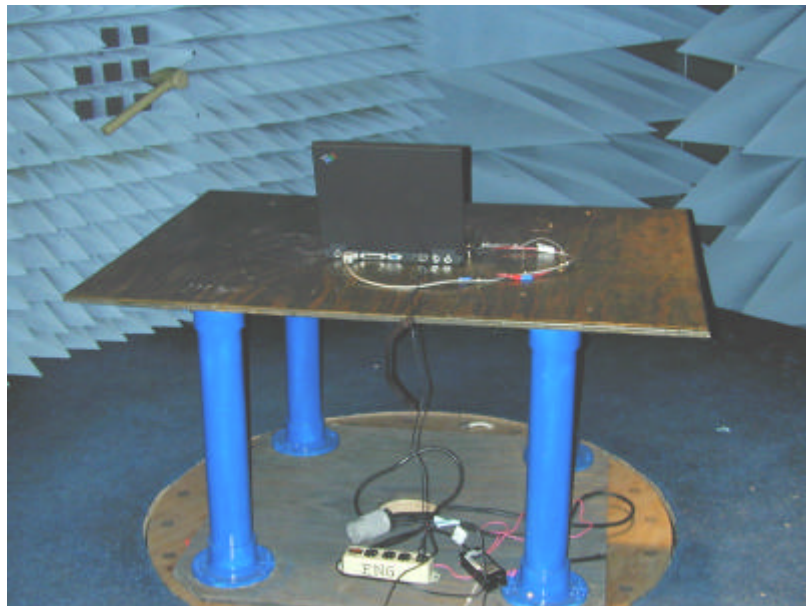
Notes: Scanned spectrum to the 10th harmonic of carrier frequency

**Photographs of Test Setup**

FRONT VIEW



REAR VIEW



## Section 7. Frequency Stability

|                                   |                   |
|-----------------------------------|-------------------|
| NAME OF TEST: Frequency Stability | PARA. NO.: 2.1055 |
| TESTED BY: David Light            | DATE:5/21/2001    |

**Test Results:** Complies.

**Measurement Data:** See attached table.

Standard Test Frequency: 836.52 MHz  
Standard Test Voltage: 115 VAC

**Equipment Used:** 1036-283-1042-1469

**Measurement Uncertainty:**  $1 \times 10^{-7}$  ppm

**Temperature:** 22 °C

**Relative Humidity:** 50 %

## Test Data – Frequency Stability



## Dallas Headquarters:

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Tel: (972) 436-9600  
Fax: (972) 436-2667

## Frequency Stability

Client: G-TranW.O.# 1L0155REUT: GPC-3000 (Dot Surfer)S/N: NoneDate: 5/21/01Tech: Light

Test Equipment used: 1036-283-1469-1042

| Temperature                                     | Voltage | Frequency Error (Hz) | Rho    |
|---|---------|----------------------|--------|
| 20 °C   | 115 VAC | -133                 | 0.9918 |
| 20 °C   | 98 VAC  | -237                 | 0.9927 |
| 20 °C   | 132 VAC | -248                 | 0.9926 |
|   |         |                      |        |
| 10 °C   | 115 VAC | +775                 | 0.9932 |
| 0 °C  | 115 VAC | +531                 | 0.9931 |
| -10 °C  | 115 VAC | +408                 | 0.9926 |
| -20 °C  | 115 VAC | +219                 | 0.9907 |
| -30 °C  | 115 VAC | -107                 | 0.9926 |
|   |         |                      |        |
| 30 °C   | 115 VAC | -498                 | 0.9911 |
| 40 °C   | 115 VAC | -503                 | 0.9917 |
| 50 °C   | 115 VAC | -453                 | 0.9927 |
|   |         |                      |        |
| Note - Power to DUT is regulated by Laptop PC   |         |                      |        |
| Maximum frequency deviation = +775 Hz / -503 Hz |         |                      |        |
|   |         |                      |        |

*EQUIPMENT:GPC-3000*

PROJECT NO.: 1L0199RUS1

**Section 8. Test Equipment List**

| ASSET | Description                | Manufacturer<br>Model Number       | Serial Number | Cal.<br>Date | Cal.<br>Due |
|-------|----------------------------|------------------------------------|---------------|--------------|-------------|
| 1036  | SPECTRUM ANALYZER          | ROHDE & SCHWARZ<br>FSEK30          | 830844/006    | 06/14/99     | 06/14/01    |
| 1046  | Flex cable 1m              | Astrolab Inc.<br>32022-2-29094K-1M | N/A           | 01/29/01     | 01/29/02    |
| 1469  | 10 db Attenuator DC 18 Ghz | MCL Inc.<br>BW-S10W2 10db-2WDC     | NONE          | CBU          | N/A         |
| 1016  | AMPLIFIER                  | HEWLETT PACKARD<br>8449A           | 2749A00159    | 05/24/00     | 05/24/01    |
| 1481  | Microwave Highpass Filter  | K & L<br>3DH1-2000/T8000-0/0       | 4             | Cal B4 Use   | N/A         |
| 1484  | Cable 2.0-18.0 Ghz         | Storm<br>PR90-010-072              | N/A           | 05/25/00     | 05/25/01    |
| 1485  | Cable 2.0-18.0 Ghz         | Storm<br>PR90-010-216              | N/A           | 05/25/00     | 05/25/01    |
| 283   | ENVIROMENTAL CHAMBER       | ENVIROTRONICS<br>SH27              | 129010083     | 05/02/01     | 05/02/02    |
| 1042  | CABLE, 4M                  | STORM<br>PR90-010-144              | N/A           | 05/23/00     | 05/23/01    |

**Nemko Dallas, Inc.**

FCC PART 22, SUBPART H  
800 MHz CELLULAR SUBSCRIBER  
UNITS

*EQUIPMENT:GPC-3000*

PROJECT NO.: 1L0199RUS1

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## **ANNEX A - TEST DETAILS**

**NAME OF TEST: RF Power Output****PARA. NO.: 1.1046****Minimum Standard:**

Para. No. 22.913(a). The E.R.P. of mobile transmitter and auxiliary test transmitter must not exceed 7 watts.

EIA is 19B Para. No. 3.2.1.3. The transmitter shall be compiled of 8 distinct power levels.

The output power shown above shall be maintained within the range of +2 dB, -4 dB of nominal dBW value

| PL | I   | II  | III |
|----|-----|-----|-----|
| 0  | +6  | +2  | -2  |
| 1  | +2  | +2  | -2  |
| 2  | -2  | -2  | -2  |
| 3  | -6  | -6  | -6  |
| 4  | -10 | -10 | -10 |
| 5  | -14 | -14 | -14 |
| 6  | -18 | -18 | -18 |
| 7  | -22 | -22 | -22 |

**Method Of Measurement:**Detachable Antenna:

The power at antenna terminals is measured using an in-line power meter.

Integral Antenna:

If the antenna is not detachable from the circuit then the Power Output is derived using test method TIA/EIA-603-1992, Section 2.2.12.

The antenna substitution method was used to determine the equivalent radiated power at spurious frequencies. The spurious emissions were measured at a distance of 3 meters. The EUT was then replaced with a reference substitution antenna with a known gain referenced to a dipole. This antenna was fed with a signal at the spurious frequency. The level of the signal was adjusted to repeat the previously measured level. The resulting erp is the signal level fed to the reference antenna corrected for gain referenced to a dipole.

|   |                          |
|---|--------------------------|
| <b>NAME OF TEST: Audio Frequency Response</b> | <b>PARA. NO.: 2.1047</b> |
|---|--------------------------|

**Minimum Standard:**

Para. No. 15-19-B. From 300 to 3000 Hz the audio frequency response shall not vary more than +1 to -3 dB from a true 6dB octave pre-emphasis characteristic as referred to 1000 Hz level (with the exception of a permissible 6dB per octave roll-off from 2500 to 3000 Hz).

**Method Of Measurement:**

Operate the transmitter with the compressor disabled, and monitor the output with a frequency deviation meter or standard test receiver without standard 750-microsecond de-emphasis, with expander disabled, and without C-message weighted filter (see 6.6.2). Apply a sine wave audio input to the transmitter external audio input port, vary the modulating frequency from 300 to 3000 Hz and observe the input levels necessary to maintain a constant  $\pm 2.9$  kHz system deviation.



|   |                          |
|---|--------------------------|
| <b>NAME OF TEST: Audio Low Pass Filter Response</b> | <b>PARA. NO.: 2.1047</b> |
|---|--------------------------|

**Minimum Standard:**

Para. No. 22.915 (d). For mobile stations, signals must be attenuated as a function of frequency as follows:

- i. In the frequency ranges 3.0 to 5.9 Hz and 6.1 to 15 kHz, 40 log (f/3) dB.
- ii. In the frequency range 5.9 to 6.1 kHz, 35 dB
- iii. In the frequency range above 15 kHz, 28 dB.

**Method Of Measurement:**

Adjust the audio input frequency to 1000 Hz and adjust the input level to 20 dB greater than that required to produce  $\pm 8$  kHz deviation. Note the output level on the frequency deviation meter or standard test receiver. Using the output level as reference (0dB), vary the modulating frequency from 3000 Hz to 30,000 Hz and observe the change in output while maintaining a constant audio input level.

|  |                          |
|--|--------------------------|
| <b>NAME OF TEST: Modulation Limiting</b> | <b>PARA. NO.: 2.1047</b> |
|--|--------------------------|

**Minimum Standard:** Para. No. 22.915(b)

The levels of the modulating signals must be set to the values specified below and must be maintained within  $\pm 10\%$  of these values.

Voice:  $\pm 12$  kHz

SAT:  $\pm 2$  kHz

Wideband Data:  $\pm 8$  kHz

ST:  $\pm 8$  kHz

**Method Of Measurement:**

Voice: A 1 kHz audio tone is injected at levels between -45 and +20 dBVrms. The peak deviation is noted. This is repeated with a 300 Hz tone and a 3 kHz tone.

SAT: A SAT tone is generated by the mobile station and the peak deviation is measured.

Wideband Data: Wideband data is generated by the mobile station and the peak deviation is measured.

ST: ST data is generated by the mobile station and the peak deviation is measured.

|   |                          |
|---|--------------------------|
| <b>NAME OF TEST: Occupied Bandwidth (Voice &amp; SAT)</b> | <b>PARA. NO.: 2.1049</b> |
|---|--------------------------|

**Minimum Standard:** 22.917(b) The mean power of any emission removed from the carrier frequency by a displacement frequency ( $f_d$  in kHz) must be attenuated below the mean power of the unmodulated carrier (P) as follows:

- (i) On any frequency removed from the carrier frequency by more than 20 kHz but not more than 45 kHz: at least 26 dB
- (ii) On any frequency removed from the carrier frequency by more than 45 kHz, up to the first multiple of the carrier frequency:

at least 60 dB or  $43 + 10 \log (P)$  dB, whichever is the lesser attenuation.

**Method Of Measurement:**

Spectrum Analyzer Settings:

RBW: 300 Hz  
VBW:  $\geq$  RBW  
Span: 100 kHz  
Sweep: Auto  
Mask: CELLF3E

Input Signal Characteristics (F3E/F3D):

AF1 frequency: 2.5 kHz  
AF1 level: 16 dB above the level sufficient to produce  $\pm 6$  kHz deviation with a 1 kHz tone.  
SAT: 6000 Hz SAT  
SAT level: sufficient to produce  $\pm 2$  kHz deviation.

|   |                          |
|---|--------------------------|
| <b>NAME OF TEST: Occupied Bandwidth (WBD &amp; SAT)</b> | <b>PARA. NO.: 2.1049</b> |
|---|--------------------------|

**Minimum Standard:** 22.917(d) The mean power of any emission removed from the carrier frequency by a displacement frequency ( $f_d$  in kHz) must be attenuated below the mean power of the unmodulated carrier (P) as follows:

(1) On any frequency removed from the carrier frequency by more than 20 kHz but not more than 45 kHz:

at least 26 dB

(2) On any frequency removed from the carrier frequency by more than 45 kHz but not more than 90 kHz:

at least 45 dB

(3) On any frequency removed from the carrier frequency by more than 90 kHz, up to the first multiple of the carrier frequency:

at least 60 dB or  $43 + 10 \log (P)$  dB, whichever is the lesser attenuation.

**Method Of Measurement:**

Spectrum Analyzer Settings:

RBW: 300 Hz

VBW:  $\geq$  RBW

Span: 200 kHz

Sweep: Auto

Mask: CELLF1D

Input Signal Characteristics:

RF level: Maximum recommended by manufacturer

10 kbps WBD + DAT

ST

|   |                          |
|---|--------------------------|
| <b>NAME OF TEST: Spurious Emission at Antenna Terminals</b> | <b>PARA. NO.: 2.1051</b> |
|---|--------------------------|

**Minimum Standard:** Para. No. 22.917(b). The mean power of emissions must be attenuated below the mean power of the unmodulated carrier on any frequency twice or more than twice the fundamental emission by at least  $43 + 10 \log P$ . This is equivalent to -13 dBm absolute power.

**Method Of Measurement:**

Spectrum Analyzer Settings:

RBW: 30 kHz (AMPS). As required for digital modulations.

VBW:  $\geq$  RBW

Start Frequency: 0 MHz

Stop Frequency: 10 GHz

Sweep: Auto

|   |                          |
|---|--------------------------|
| <b>NAME OF TEST: Field Strength of Spurious Radiation</b> | <b>PARA. NO.: 2.1053</b> |
|---|--------------------------|

**Minimum Standard:**

Para. No. 22.917(b). The mean power of emissions must be attenuated below the mean power of the unmodulated carrier on any frequency twice or more than twice the fundamental emission by at least  $43 + 10 \log P$ . This is equivalent to -13 dBm absolute power.

**Test Method:**

TIA/EIA-603-1992, Section 2.2.12

The antenna substitution method was used to determine the equivalent radiated power at spurious frequencies. The spurious emissions were measured at a distance of 3 meters. The EUT was then replaced with a reference substitution antenna with a known gain referenced to a dipole. This antenna was fed with a signal at the spurious frequency. The level of the signal was adjusted to repeat the previously measured level. The resulting erp is the signal level fed to the reference antenna corrected for gain referenced to a dipole.

**NAME OF TEST: Frequency Stability****PARA. NO.: 2.1055****Minimum Standard:**

Para. No. 22.355. The transmitter carrier frequency shall remain within the tolerances given in Table C-1.

| Freq. Range (MHz) | Mobile > 3 W | Mobile ≤ 3 W |
|-------------------|--------------|--------------|
| 821 to 896        | 2.5          | 2.5          |

Table C-1

**Method Of Measurement:**Frequency Stability With Voltage Variation:

The E.U.T. is placed in an environmental chamber and allowed to stabilize at +20 degrees Celsius for at least 15 minutes. The frequency counter and signal generator are phase locked with the same 10 MHz reference frequency by connecting the 10 MHz ref. out of the counter to the 10 MHz ref, in of the signal generator. With the voltage input to the E.U.T. set to 85% S.T.V., the frequency is measured in 30 second intervals for a period of 5 minutes. This procedure is repeated at 100% S.T.V. and 115% S.T.V.

Frequency Stability With Temperature Variation:

The input voltage to the E.U.T. is set to S.T.V. and the temperature of the environmental chamber is varied in 10 degree steps from -30 degrees C to +50 degrees C. The E.U.T. is allowed to stabilize at each temperature and the frequency is measured in 30 second intervals for a period of 5 minutes.

**Nemko Dallas, Inc.**

FCC PART 22, SUBPART H  
800 MHz CELLULAR SUBSCRIBER  
UNITS

*EQUIPMENT:GPC-3000*

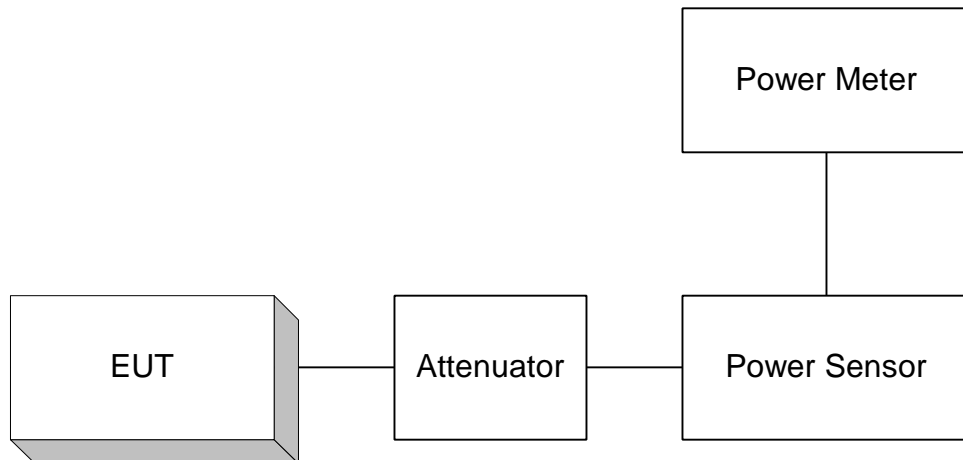
PROJECT NO.: 1L0199RUS1

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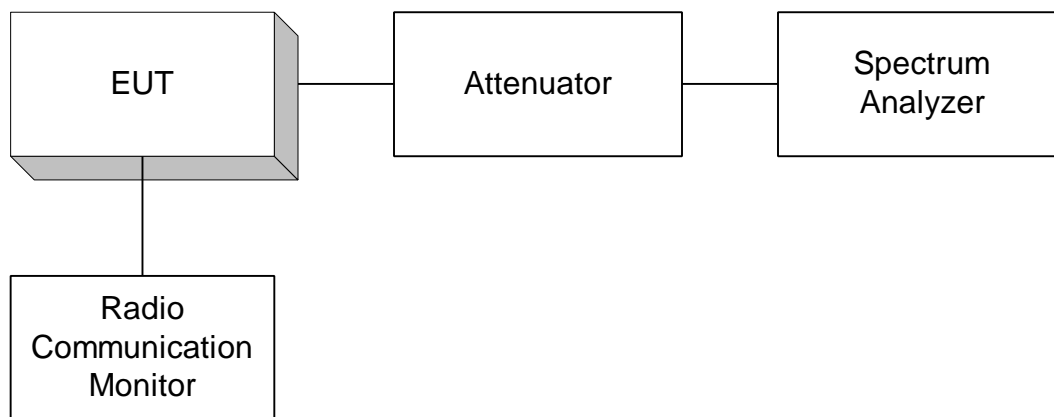
## **ANNEX B - TEST DIAGRAMS**



**Para. No. 2.1046 - R.F. Power Output**

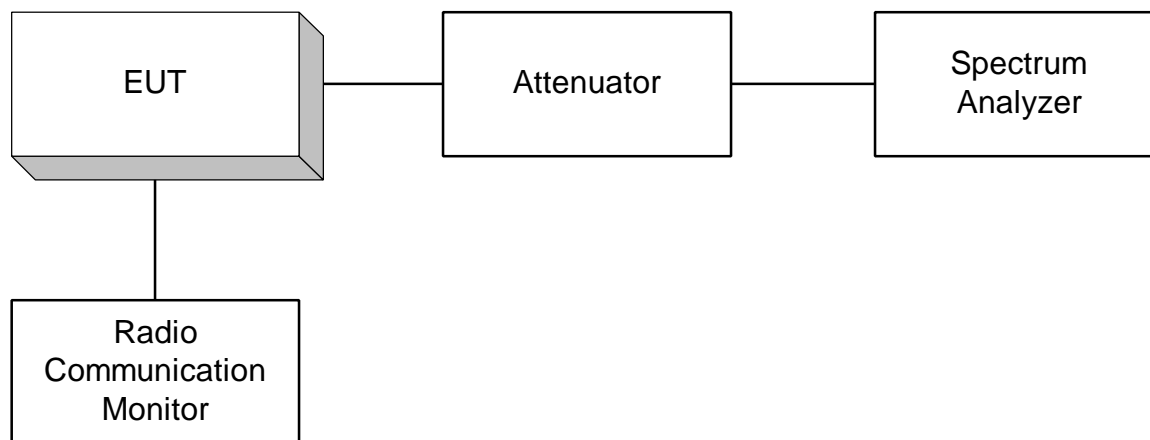


**Para. No. 2.1049 - Occupied Bandwidth**



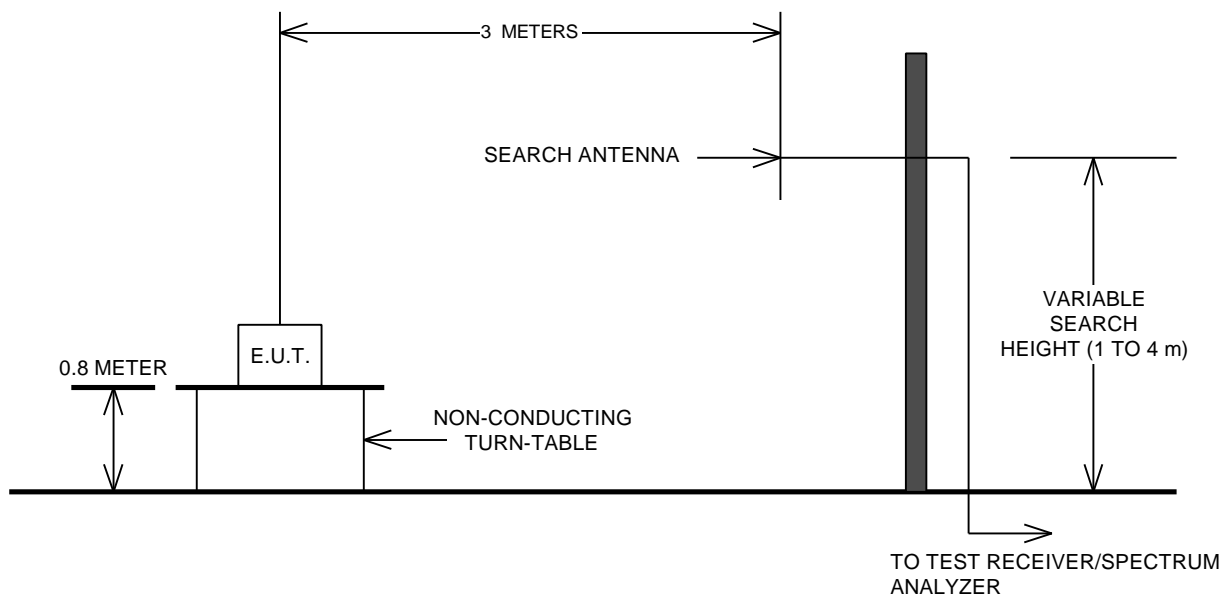
*The Radio Communication Monitor is used only to provide modulation input for external modulation.*

**Para. No. 2.1051 Spurious Emissions at Antenna Terminals**

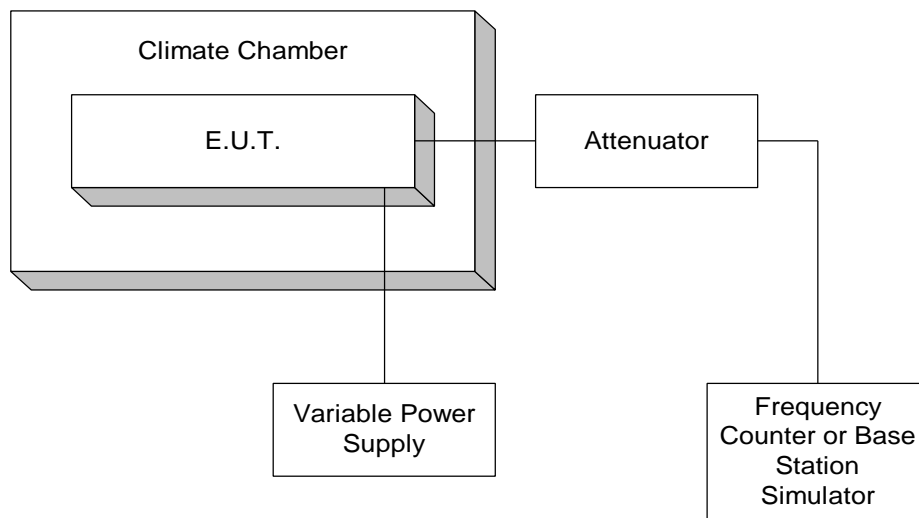


*The Radio Communication Monitor is used only to provide modulation input for external modulation.*

**Para. No. 2.1053 - Field Strength of Spurious Radiation**



**Para. No. 2.1055 - Frequency Stability**



**Para. No. 2.1045 – Audio Frequency Response, Audio Low Pass Filter Response And Modulation Limiting**

