TIMCO ENGINEERING INC.
849 NW State Road 45
Newberry, Florida 32669
http://www.timcoengr.com
888.472.2424 F 352.472.2030 email: tei@timcoengr.com

Part 22, 74, 80, and 90 Type Approval Test Report

Product Name: VHF TRANSCEIVER

FCC ID: K95DMH599

Applicant

BK RADIO INC.
C/O RELM COMMUNICATIONS
7505 TECHNOLOGY DRIVE
WEST MELBOURNE FL 32904 USA

Date Receipt: 4/1/2005

Date Tested: 4/11/2005

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**APPLICANT:** BK RADIO INC.

**FCC ID:** K95DMH599

**TEST REPORT**



**EXHIBITS CONTAINING**

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# GENERAL INFORMATION REQUIRED FOR CERTIFICATION OF A LICENSED TRANSMITTER

**Part 2.1033(c)(1)(2)** BK RADIO INC. will manufacture the FCCID: K95DMH599 VHF TRANSCEIVER in quantity, for use under FCC RULES PART 22, PART 74, PART 80, and PART 90

BK RADIO INC.
C/O RELM COMMUNICATIONS
7505 TECHNOLOGY DRIVE
WEST MELBOURNE, FL 32904 USA

**Part 2.1033(c)** TECHNICAL DESCRIPTION

**Part 2.1033(c)(3)** Instruction book. A draft copy of the instruction manual is included.

**Part 2.1033(c) (4)** Type of Emission: 16K0F3E
**Part 22** Bn = 2M + 2DK
**Part 74** M = 3000
**Part 80** D = 5000
**Part 90.209** Bn = 2(3000)+2(5000) = 16.0k
**Part 90.207**

**Part 2.1033(c) (4)** Type of Emission: 11K0F3E
**Part 90.209**
**Part 90.207** Bn = 2M + 2DK
M = 3000
D = 2500
Bn = 2(3000)+2(2500) = 11.0k

**Part 2.1033(c) (4)** Type of Emission: 8K10F1D
**Part 90.209**
**Part 90.207** Bn = 2M + 2DK
M = 3000 bps
D = 1050
Bn = 2(3000)+2(1050) = 8.1k

**Part 2.1033(c) (4)** Type of Emission: 8K10F1E
**Part 22** Bn = 2M + 2DK
**Part 74** M = 3000
**Part 80** D = 1050
**Part 90.209** Bn = 2(3000)+2(1050) = 8.1k
**Part 90.207**

**Part 2.1033(c)(5)** Frequency Range: 136-174 MHz

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**Part 2.1033(c)(6)(7)** Power Output shall not exceed 59 Watts into a 50 ohm
**Part 22** resistive load. There are no user power controls.
**Part 74.461**
**Part 80.215**
**Part 90.205**

**Part 2.1033(c)(8)** DC Voltages and Current into Final Amplifier:
POWER INPUT:

FINAL AMPLIFIER ONLY
INPUT POWER – HIGH: (13.6V)(10.4A) = 141.44 Watts
INPUT POWER – LOW: (13.6V)(6.3A) = 85.68 Watts

**Part 2.1033(c)(9) Tune-up procedure.** The tune-up procedure is included.

**Part 2.1033(c)(10) Complete Circuit Diagrams:** The circuit diagram is included. The block diagram is included.

**Part 2.1033(c)(10):** Description of all circuitry and devices provided for determining and stabilizing frequency is included in the circuit description.

**Part 2.1033(c)(11)**: A photograph or drawing of the equipment identification label is included.

**Part 2.1033(c)(12):** Photographs of the equipment of sufficient clarity to reveal equipment construction and layout and label location are included.

**Part 2.1033(c)(13):** For equipment employing digital modulation, a detailed description of the modulation technique. This UUT uses FSK to modulate the transmitter.

**Part 2.1033(c)(14):** The data required for 2.1046 through 2.1057 is submitted below.

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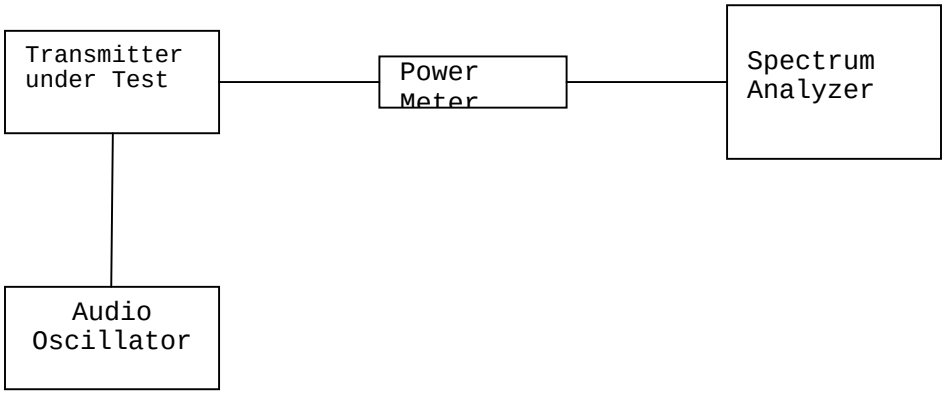
**Part 2.1046(a) RF POWER OUTPUT**
**Part 22**
**Part 74.461**
**Part 80.215**
**Part 90.205**

RF power is measured by connecting a 50-ohm, resistive wattmeter to the RF output connector. With a nominal battery voltage, and the transmitter properly adjusted the RF output measures:

OUTPUT POWER: HIGH – 50 Watts
LOW - 25 Watts



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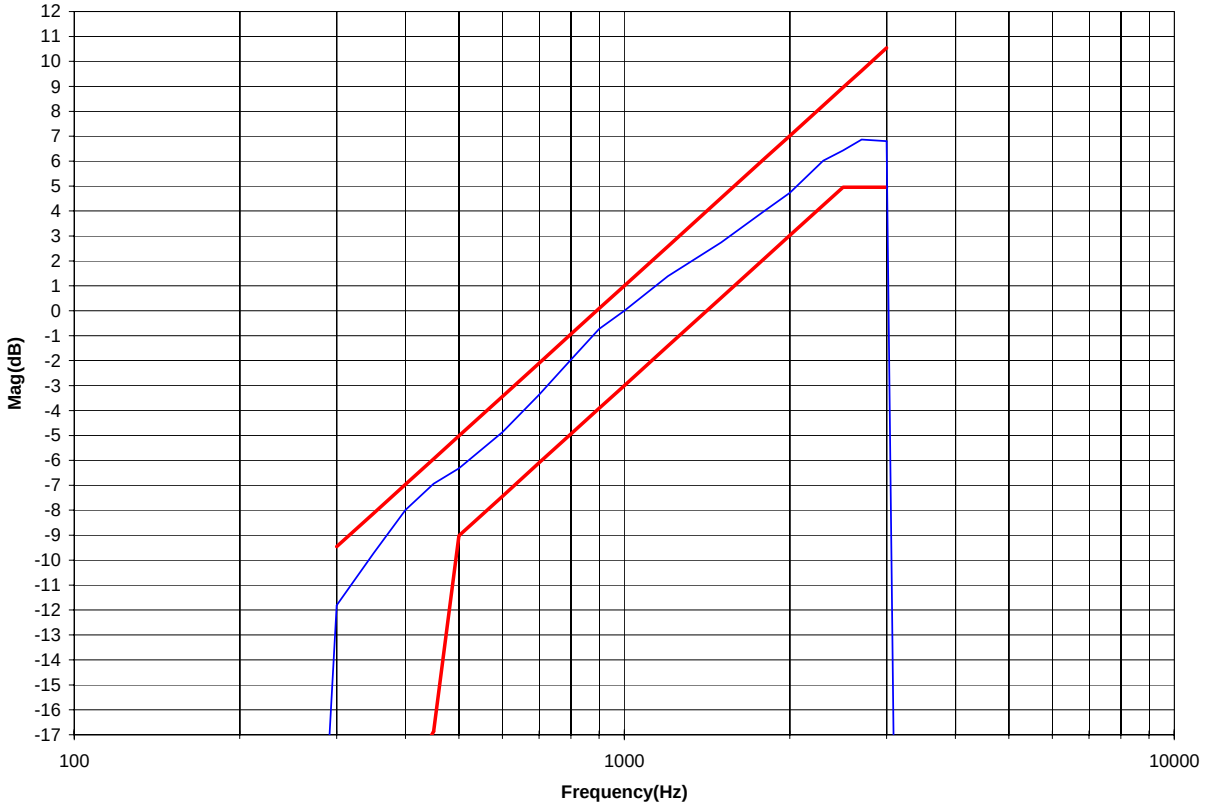
**Part 2.1047(a)(b) Modulation characteristics:**
**Part 74.463**
**Part 80.213**
**Part 90.205**

AUDIO FREQUENCY RESPONSE
The audio frequency response was measured in accordance with TIA/EIA Specification 603. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 – 5000Hz shall be submitted. The audio frequency response curve is shown below.

**AUDIO FREQUENCY RESPONSE PLOT**

25KHz TX Audio Response 155MHz



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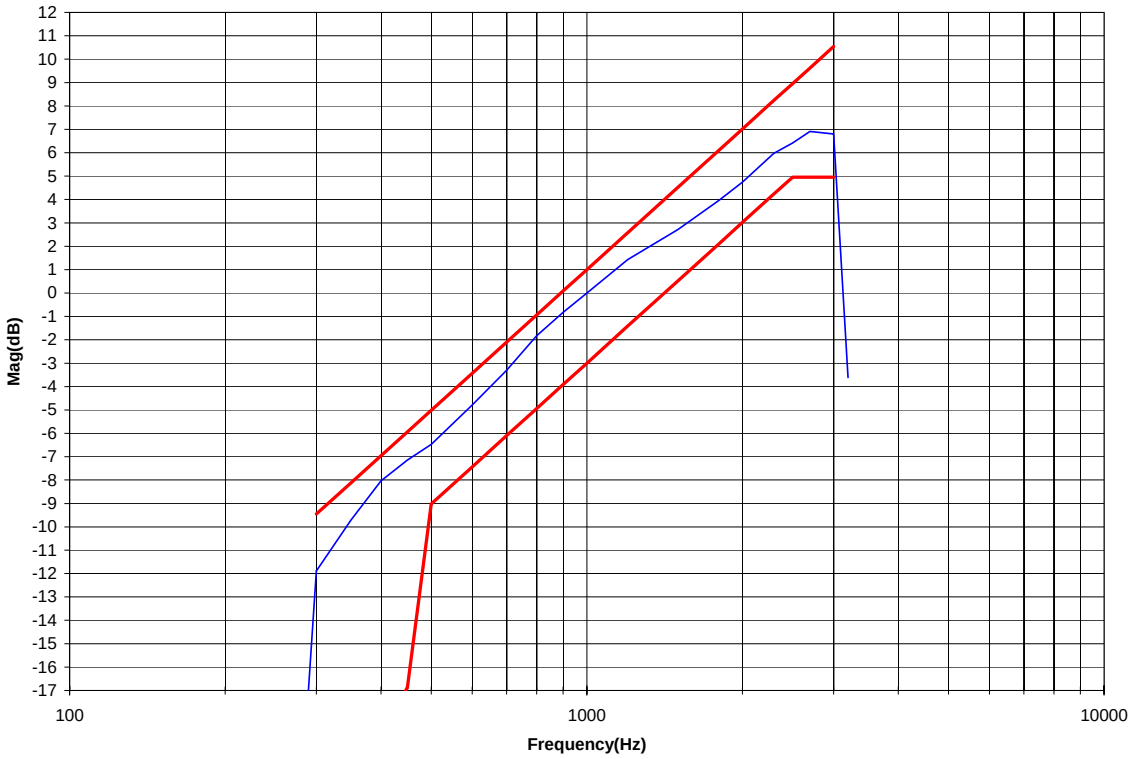
AUDIO FREQUENCY RESPONSE

The audio frequency response was measured in accordance with TIA/EIA Specification 603. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 – 5000Hz shall be submitted. The audio frequency response curve is shown below.

**AUDIO FREQUENCY RESPONSE PLOT**

12.5KHz TX Audio Response 155MHz



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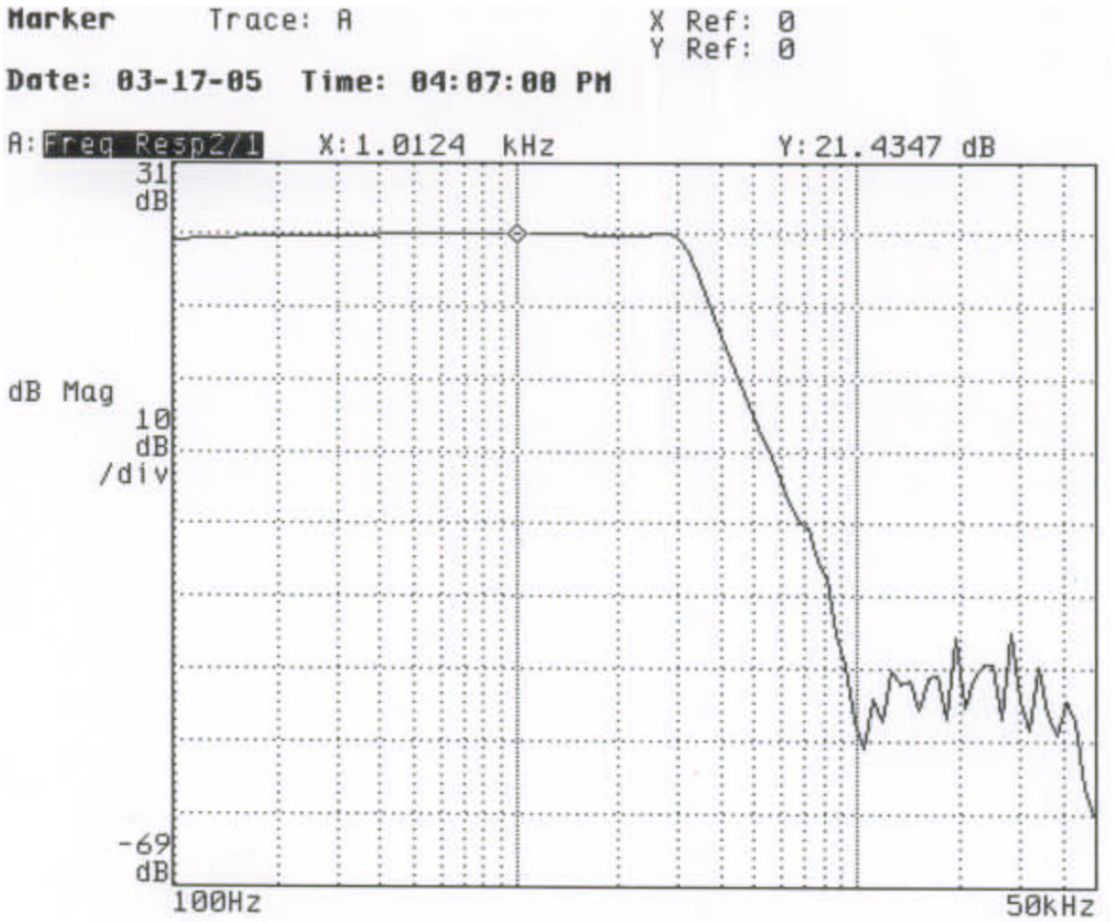
**Part 2.1047(a) Voice modulated communication equipment:** For equipment required to have an audio low-pass filter, a curve showing the frequency response of the filter, or of all the circuitry installed between the modulation limiter and the modulated stage shall be submitted.

**AUDIO LOW PASS FILTER**



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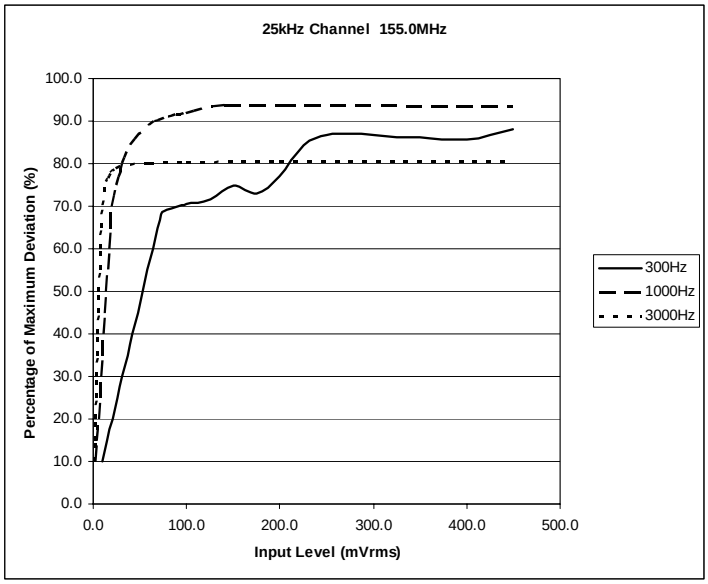
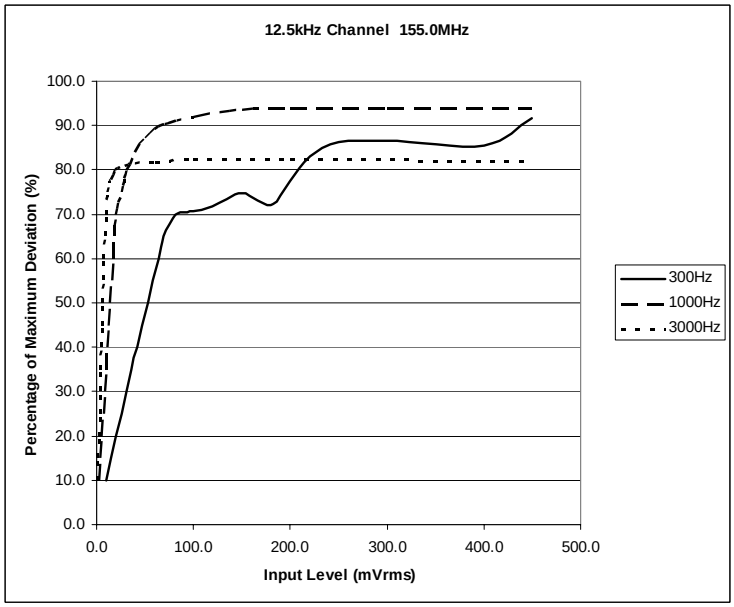
**Part 2.1047(b) Audio input versus modulation**

The audio input level needed for a particular percentage of modulation was measured in accordance with TIA/EIA Specification 603. The audio input curves versus modulation are shown below. Curves are provided for audio input frequencies of 300, 1000, and 2500 Hz.

**MODULATION LIMITING PLOTS**



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**Part 2.1049 Occupied bandwidth**

**Part 2.1049(c) EMISSION BANDWIDTH**
**Emission Mask B - 25kHz Channel Spacing**
**Part 22.359**
**Part 74.462**
**Part 80.211**
**Part 90.210(b)**

Data in the plots show that on any frequency removed from the assigned frequency by more than 50%, but not more than 100%: At least 25dB. On any frequency removed from the assigned frequency by more than 100%, but not more than 250%: At least 35 dB. On any frequency removed from the assigned frequency by more than 250%, of the authorized bandwidth: At least 43 + 10log(P)dB.

**Part 90.210(d) Emission Mask D - 12.5 kHz channel BW equipment**
For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

(1) On any frequency from the center of the authorized bandwidth f0 to 5.625 kHz removed from f0: Zero dB.
(2) On any frequency from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 5.625 kHz but no more than 12.5 kHz: At least 7.27 (fd - 2.88 kHz) dB.
(3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 12.5 kHz: At least 50 + 10log(P) dB or 70 dB, whichever is the lesser attenuation.

**Part 90.210(e) Emission Mask E – 6.25 kHz channel BW equipment.**
For transmitters designed to operate with a 6.25 kHz bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

(1) On any frequency from the center of the authorized bandwidth f0 to 3.0 kHz removed from f0: Zero dB.
(2) On any frequency from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 3.0 kHz but no more than 4.6 kHz: At least 30 + 16.67(fd – 3.0 kHz) or 55 + 10 Log(P) or 65, whichever us the lesser attenuation.
(3) On any frequency removed from the center of the authorized bandwidth by more than 4.6kHz: At least 55 + 10log(P) dB or 65 dB, whichever is the lesser attenuation.

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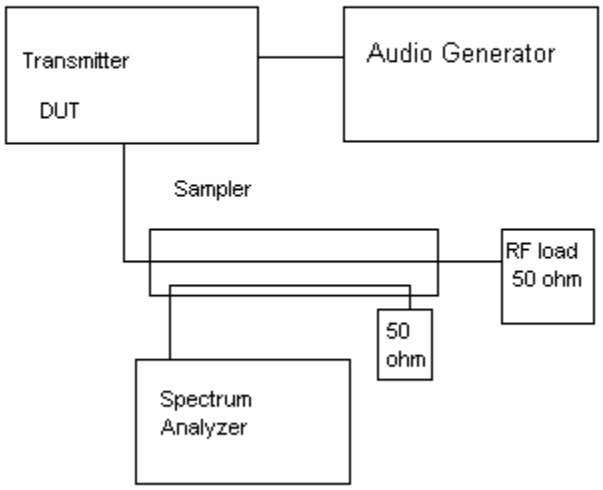
Radiotelephone transmitter with modulation limiter:

Test procedure diagram

**OCCUPIED BANDWIDTH MEASUREMENT**

Occupied BW Test Equipment Setup



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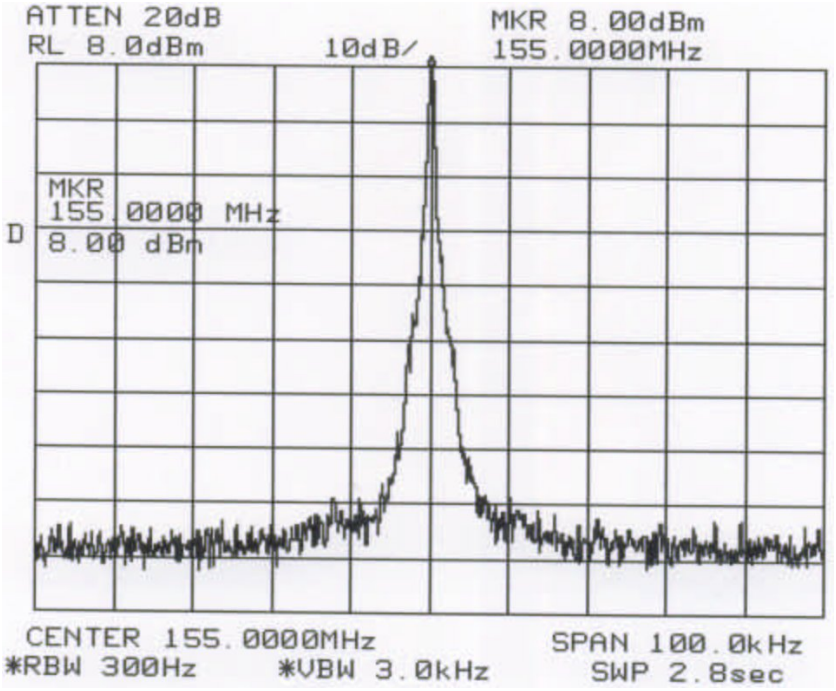
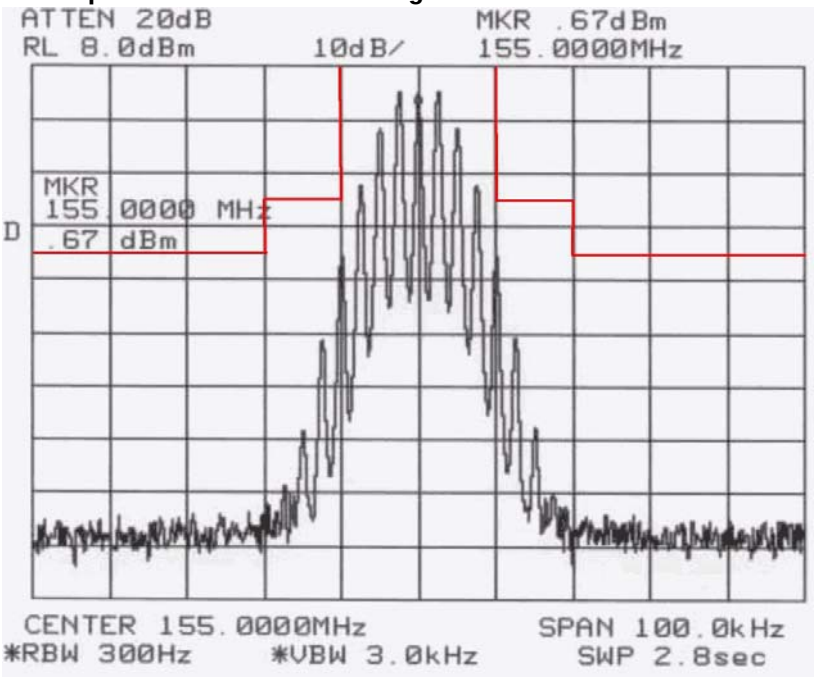
**OCCUPIED BANDWIDTH PLOT**
**Occupied Bandwidth No Modulation**




**Occupied Bandwidth Analog Voice 16K0F3E Mask B**



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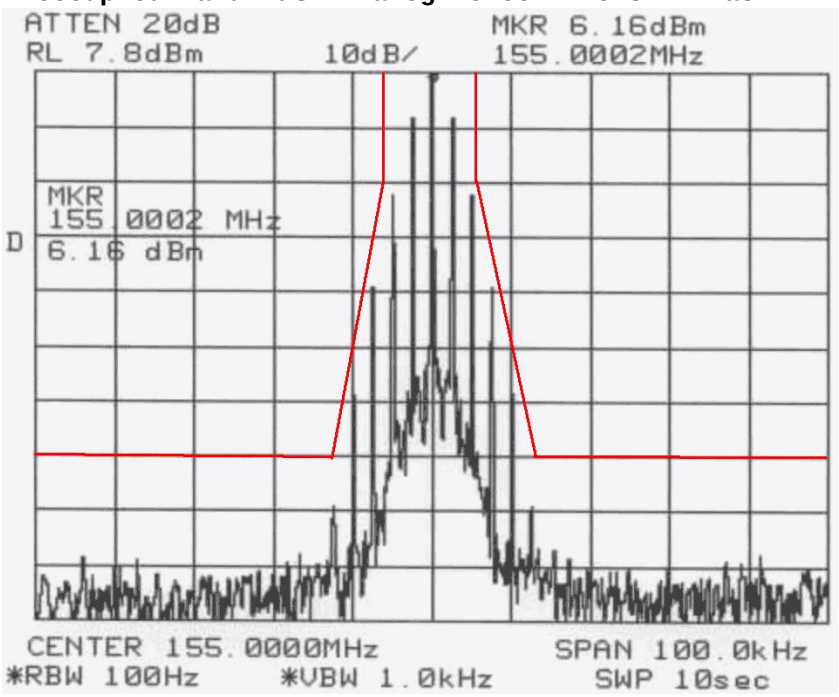
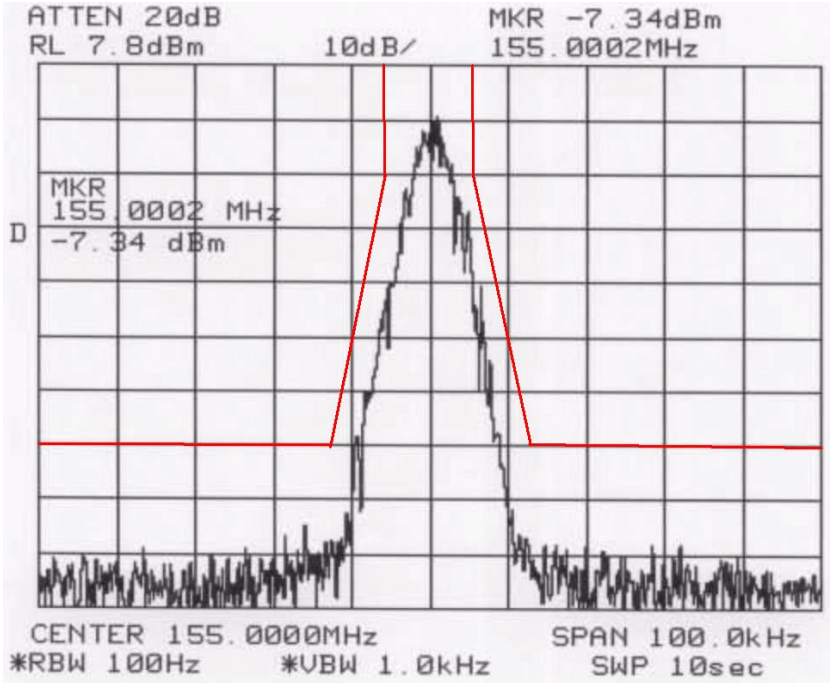
**OCCUPIED BANDWIDTH PLOT**

**Occupied Bandwidth Analog Voice 11K0F3E Mask D**




**Occupied Bandwidth Digital Voice 8K10F1D Mask D**



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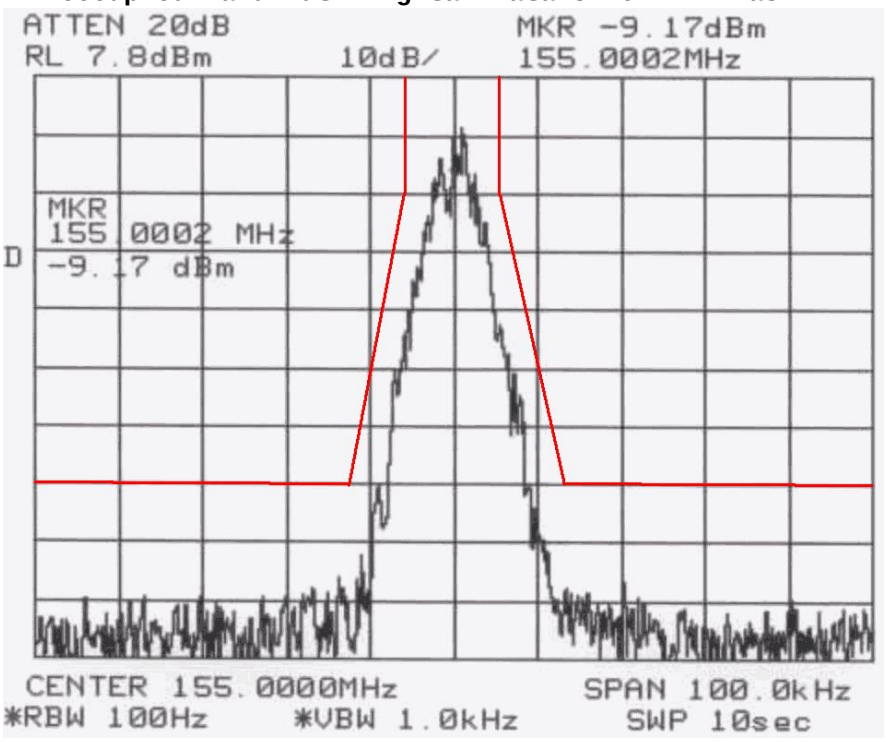
**OCCUPIED BANDWIDTH PLOT**
**Occupied Bandwidth Digital Data 8K10F1E Mask D**



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**Part 2.1051(a) Spurious emissions at antenna terminals (conducted)**
**Part 22.359**
**Part 74.462**
**Part 80.211**
**Part 90.210**

Data below shows the level of conducted spurious responses. The carrier was modulated 100% using a 2500 Hz tone. The spectrum was scanned from 0.4 to at least the 10th harmonic of the fundamental. The measurements were made in accordance with standard TIA/EIA-603.

FCC Limit for:

| | | | |
|---|---|---|---|
| 25kHz Channel Spacing = | (High Power) | 43+10log(50)= | 59.98 dB |
| | (Low Power) | 43+10log(25)= | 56.98 dB |
| 12.5kHz Spacing = | (High Power) | 50+10log(50)= | 66.99 dB |
| | (Low Power) | 50+10log(25)= | 63.98 dB |

| TF HIGH POWER | EF | dB below carrier |
|---|---|---|
| 136 | 136 | 0 |
| | 272 | 81.5 |
| | 408 | 72.7 |
| | 544 | 108.8 |
| | 680 | 110.1 |
| | 816 | 112.6 |
| | 952 | 108.8 |

| TF LOW POWER | EF | dB below carrier |
|---|---|---|
| 136 | 136 | 0 |
| | 272 | 76.1 |
| | 408 | 76.1 |
| | 544 | 106.8 |
| | 680 | 94.2 |
| | 816 | 110.3 |
| | 952 | 102.6 |
| | 1088 | 109.8 |
| | 1224 | 108.4 |

| TF HIGH POWER | EF | dB below carrier |
|---|---|---|
| 174 | 174 | 0 |
| | 348 | 75.2 |
| | 522 | 67.8 |
| | 696 | 100.8 |
| | 870 | 100.4 |
| | 1044 | 102.5 |
| | 1218 | 103.9 |
| | 1392 | 104.7 |
| | 1566 | 104.4 |

| TF LOW POWER | EF | dB below carrier |
|---|---|---|
| 174 | 174 | 0 |
| | 348 | 83.1 |
| | 522 | 75.9 |
| | 696 | 104.5 |
| | 870 | 98 |
| | 1044 | 100.4 |
| | 952 | 99 |
| | 1088 | 101.1 |
| | 1566 | 100.1 |

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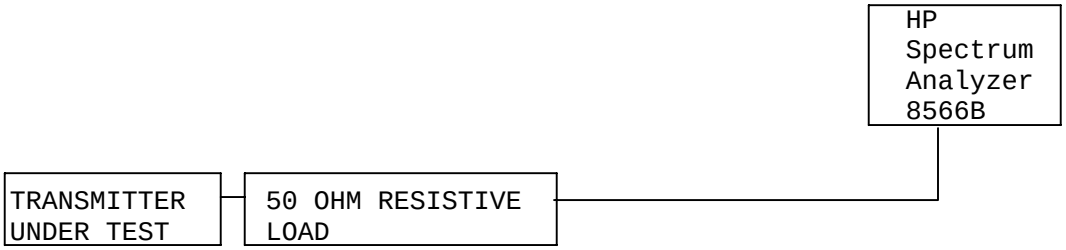
**Method of Measuring Conducted Spurious Emissions**




**METHOD OF MEASUREMENT:** The procedure used was TIA/EIA-603 STANDARD without any exceptions. The measurements were made at TIMCO ENGINEERING INC. 849 N.W. State Road 45, Newberry, Florida 32669.

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**Part 2.1053 Field strength of spurious emissions**
**Part 22.359**
**Part 74.462**
**Part 80.211**
**Part 90.210**

FCC Limit for:

| | | | |
|---|---|---|---|
| 25kHz Channel Spacing = | (High Power) | 43+10log(50)= | 59.98 dB |
| | (Low Power) | 43+10log(25)= | 56.98 dB |
| 12.5kHz Spacing = | (High Power) | 50+10log(50)= | 66.99 dB |
| | (Low Power) | 50+10log(25)= | 63.98 dB |

**TEST DATA: Low Power High Power**

| Emission Frequency MHz | Ant. Polarity | dB Below Carrier (dBc) | Emission Frequency MHz | Ant. Polarity | dB Below Carrier (dBc) |
|---|---|---|---|---|---|
| 136.00 | 0 | 0 | 136.00 | 0 | 0 |
| 272.00 | H | 91.52 | 272.00 | H | 95.12 |
| 408.00 | H | 84.45 | 408.00 | H | 83.15 |
| 544.00 | H | 89.52 | 544.00 | H | 93.72 |
| 680.00 | H | 94.5 | 680.00 | H | 104 |
| 816.00 | H | 100.39 | 816.00 | H | 101.09 |
| 952.00 | H | 100.44 | 952.00 | V | 102.44 |
| 1088.00 | V | 91.39 | 1088.00 | V | 93.29 |
| 1224.00 | H | 91.36 | 1224.00 | H | 94.96 |
| 1360.00 | H | 92.95 | 1360.00 | H | 95.15 |

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**Part 2.1053 Field strength of spurious emissions (Continued)**

FCC Limit for:

| | | |
|---|---|---|
| 25kHz Channel Spacing = | (High Power) | 43+10log(50)= 59.98 dB |
| | (Low Power) | 43+10log(25)= 56.98 dB |
| 12.5kHz Spacing = | (High Power) | 50+10log(50)= 66.99 dB |
| | (Low Power) | 50+10log(25)= 63.98 dB |

**TEST DATA: Low Power High Power**

| Emission Frequency MHz | Ant. Polarity | dB Below Carrier (dBc) | Emission Frequency MHz | Ant. Polarity | dB Below Carrier (dBc) |
|---|---|---|---|---|---|
| 174.00 | 0 | 0 | 174.00 | 0 | 0 |
| 348.00 | H | 83.12 | 348.00 | H | 78.12 |
| 522.00 | H | 84.93 | 522.00 | H | 83.13 |
| 696.00 | H | 91.24 | 696.00 | H | 94.24 |
| 870.00 | H | 86.66 | 870.00 | H | 93.56 |
| 1044.00 | H | 93.45 | 1044.00 | H | 96.95 |
| 1218.00 | H | 96.09 | 1218.00 | H | 99.19 |
| 1392.00 | H | 93.83 | 1392.00 | H | 96.13 |
| 1566.00 | H | 93.29 | 1566.00 | H | 95.09 |

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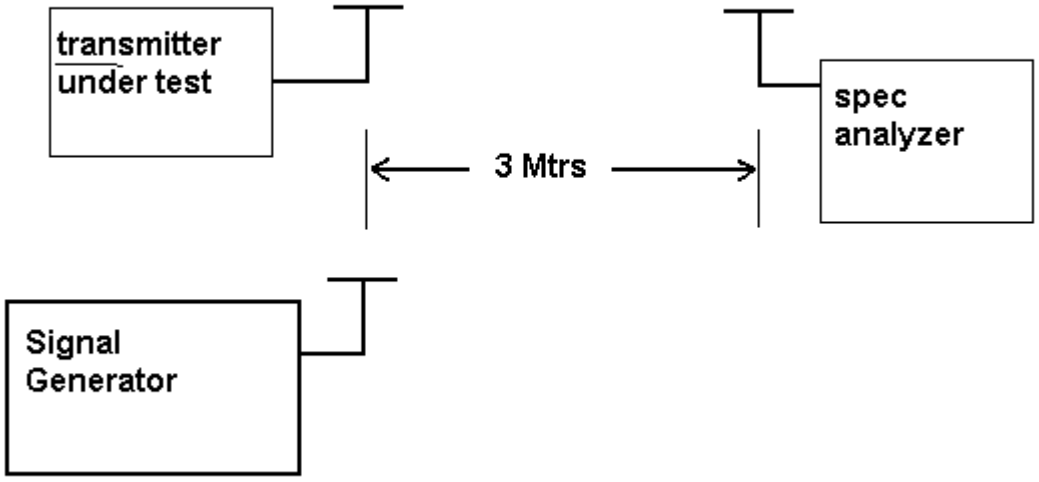
**Method of Measuring Radiated Spurious Emissions**




**METHOD OF MEASUREMENTS:** The tabulated data shows the results of the radiated field strength emissions test. The spectrum was scanned from 30 MHz to at least the tenth harmonic of the fundamental. This test was conducted per TIA/EIA STANDARD 603 using the substitution method. Measurements were made at the open field test site of TIMCO ENGINEERING, INC. located at 849 NW State Road 45, Newberry, FL 32669.

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**Part 2.1055 Frequency stability**
**Part 22.355**
**Part 74.464**
**Part 80.209**
**Part 90.213**

Frequency Stability Requirement:

Temperature range requirements: -30 to +50° C.

Voltage Variation +, - 15%.

Measurement procedure per TIA/EIA 603

**MEASUREMENT DATA**

Assigned Frequency (Ref. Frequency): 136.000000 MHz

| TEMPERATURE °C | FREQUENCY MHz | PPM |
|---|---|---|
| -30C | 136.000022 | -0.05 |
| -20C | 136.000082 | 0.39 |
| -10C | 136.000148 | 0.87 |
| 0C | 136.000130 | 0.74 |
| 10C | 136.000075 | 0.34 |
| 20C | 136.000029 | 0.00 |
| 30C | 136.000018 | -0.08 |
| 40C | 136.000023 | -0.04 |
| 50C | 136.000015 | -0.10 |

| Batt. Volts | Batt. Data | PPM |
|---|---|---|
| -15% | 136.000027 | -0.01 |
| +15% | 136.000030 | 0.01 |

**RESULTS OF MEASUREMENTS:** The test results indicates that the EUT meets the requirements.

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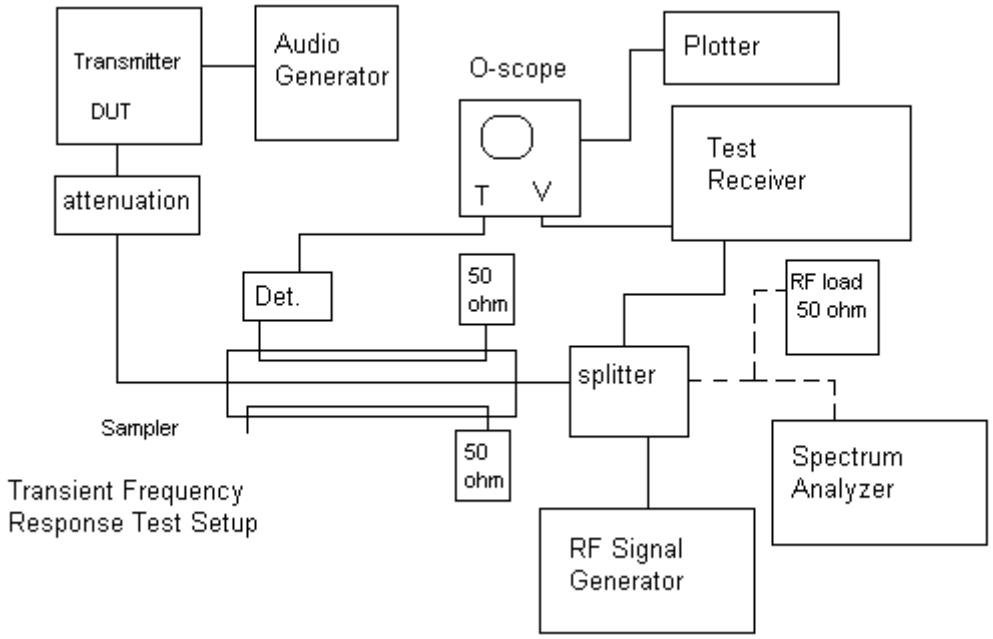
**Part 2.1055(a)(1) Frequency stability**
**Part 90.214** Transient Frequency Behavior

**REQUIREMENTS:** Transmitters designed to operate in the 150-174 MHz and 421-512 MHz frequency bands must maintain transient frequencies within the maximum transient frequencies within the maximum frequency difference limits during the time intervals indicated:

| Time Intervals | Maximum frequency Difference | All Equipment | |
|---|---|---|---|
| | | 150-174 MHz | 421-512 MHz |
| Transient Frequency Behavior for Equipment Designed to Operate on 25 kHz Channels | | | |
| $t_1$[4] | ±25.0 kHz | 5.0 mS | 10.0 mS |
| $t_2$ | ±12.5 kHz | 20.0 mS | 25.0 mS |
| $t_3$[4] | ±25.0 kHz | 5.0 mS | 10.0 mS |
| Transient Frequency Behavior for Equipment Designed to Operate on 12.5 kHz Channels | | | |
| $t_1$[4] | ±12.5 kHz | 5.0 mS | 10.0 mS |
| $t_2$ | ±6.25 kHz | 20.0 mS | 25.0 mS |
| $t_3$[4] | ±12.5 kHz | 5.0 mS | 10.0 mS |
| Transient Frequency Behavior for Equipment Designed to Operate on 6.25 kHz Channels | | | |
| $t_1$[4] | ±6.25 kHz | 5.0 mS | 10.0 mS |
| $t_2$ | ±3.125 kHz | 20.0 mS | 25.0 mS |
| $t_3$[4] | ±6.25 kHz | 5.0 mS | 10.0 mS |

**TEST PROCEEDURE:** TIA/EIA TS603 PARA 2.2.19, the levels were set as follows;

1. Using the variable attenuator the transmitter level was set to 40 dB below the test receivers maximum input level, then the transmitter was turned off.
2. With the transmitter off the signal generator was set 20dB below the level of the transmitter in the above step, this level will be maintained with the signal generator through-out the test.
3. Reduce the attenuation between the transmitter and the RF detector by 30 dB.
4. With the levels set as above the transient frequency behavior was observed & recorded.



Transient Frequency Response Test Setup

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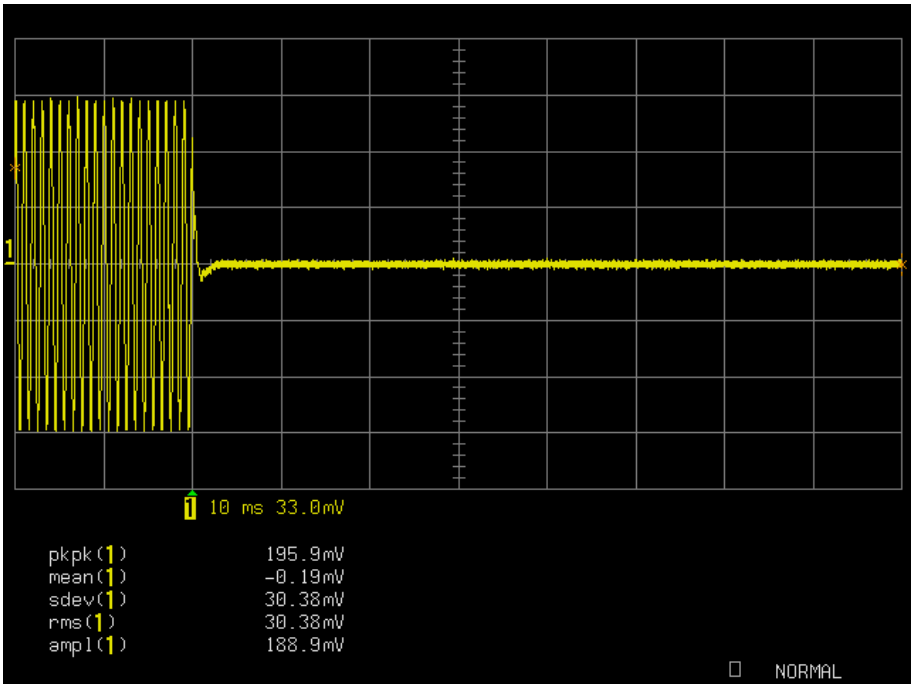
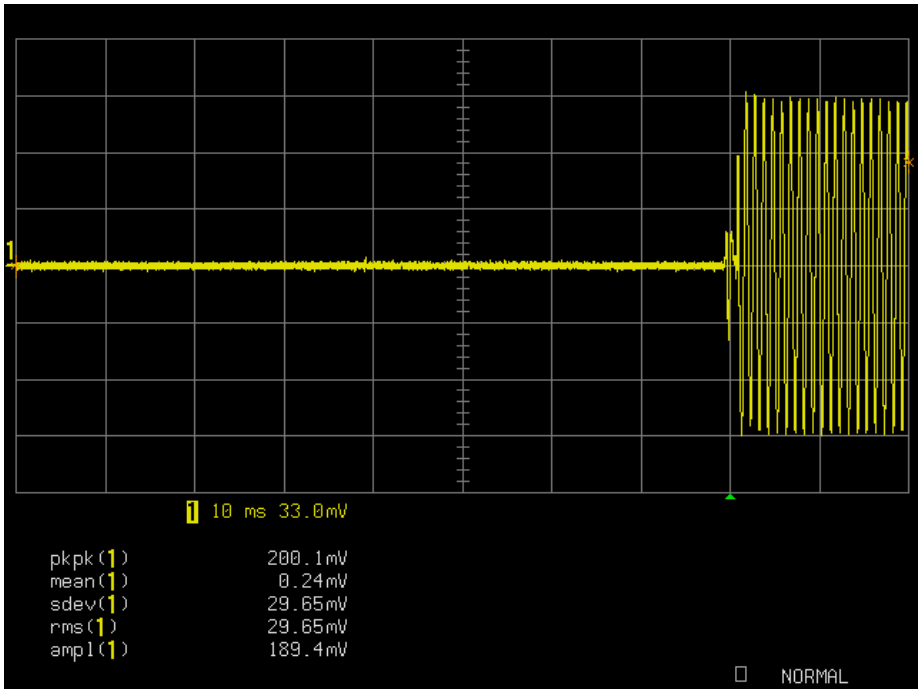
**HIGH POWER**
**TRANSIENT FREQUENCY RESPONSE PLOT – 12.5 kHz**




APPLICANT: BK RADIO INC.
FCC ID: K95DMH599
REPORT #: B\BKRADIO_K95\674AUT55\674AUT55TestReport.doc

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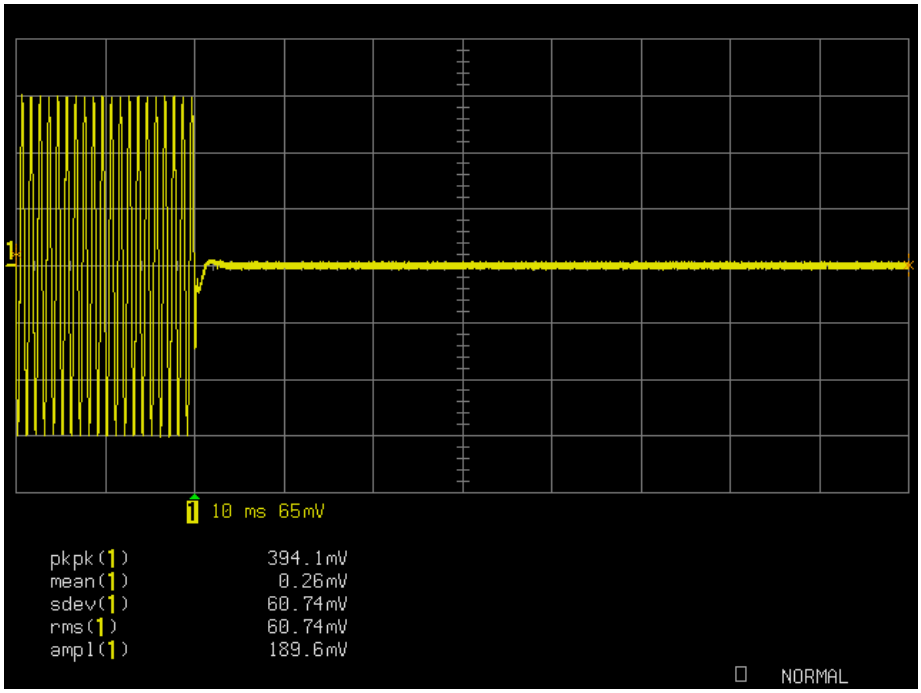
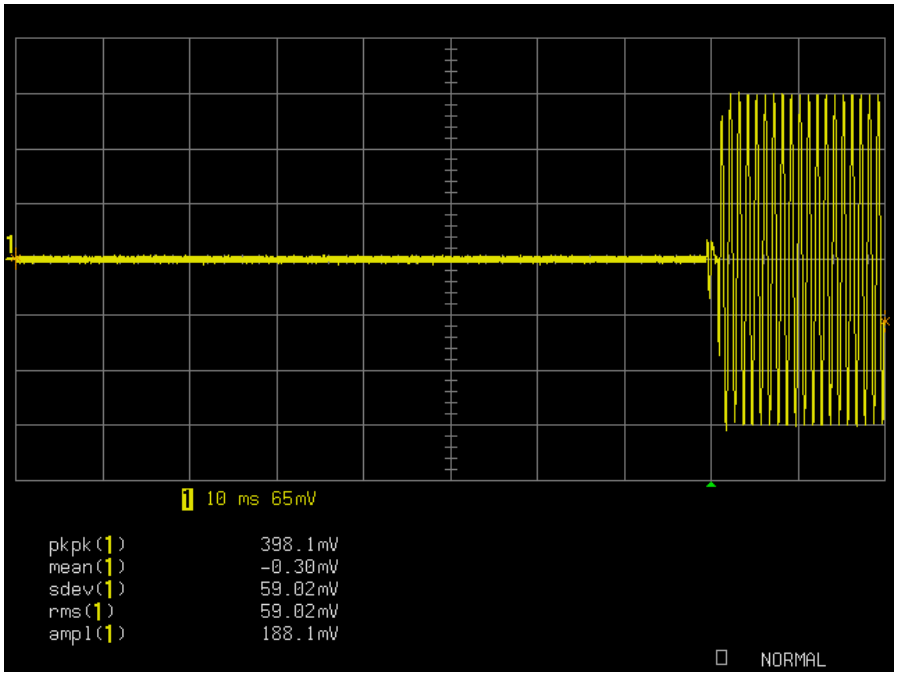
**HIGH POWER**
**TRANSIENT FREQUENCY RESPONSE PLOT – 25 kHz**



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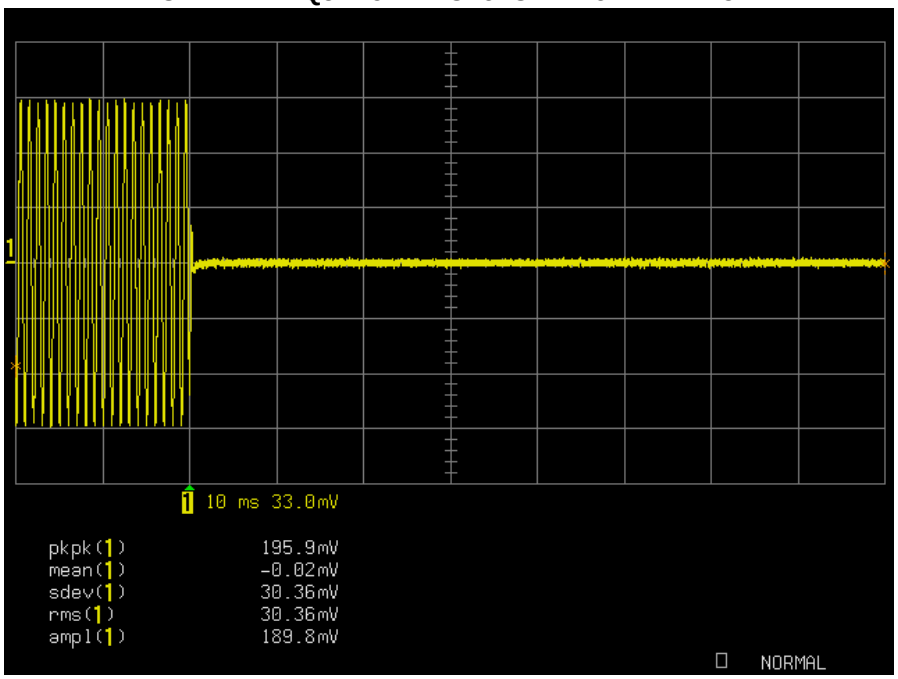
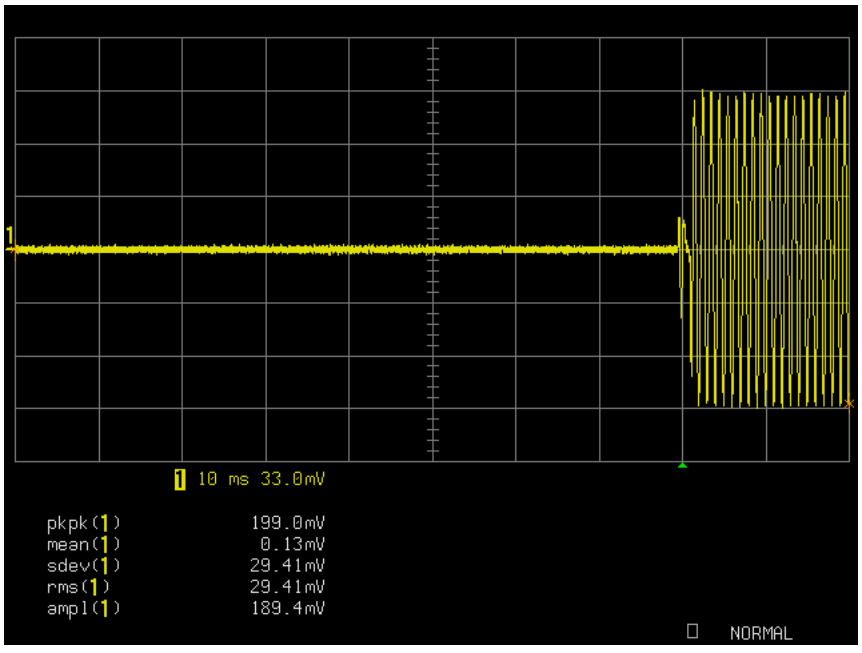
**LOW POWER**
**TRANSIENT FREQUENCY RESPONSE PLOT – 12.5 kHz**



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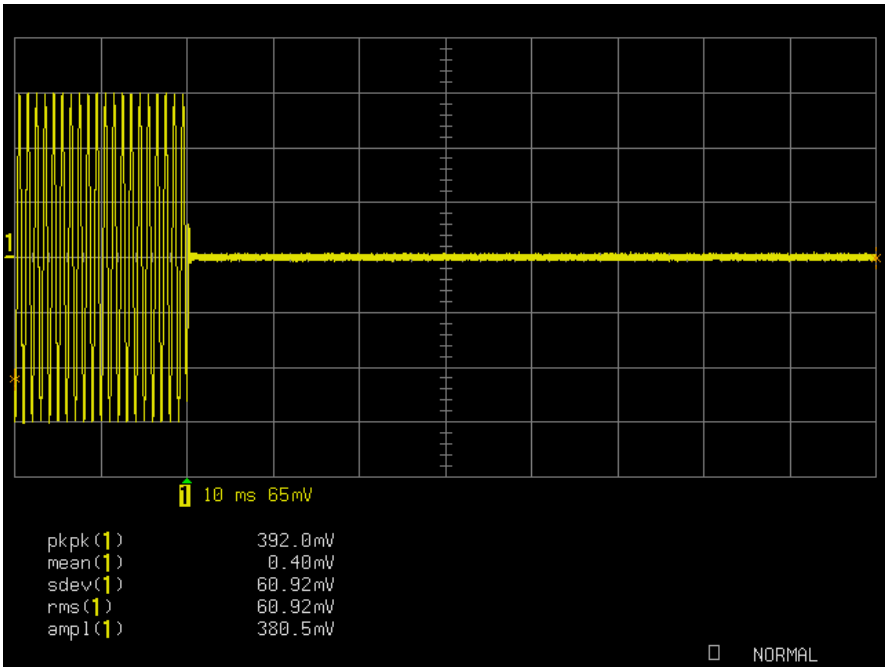
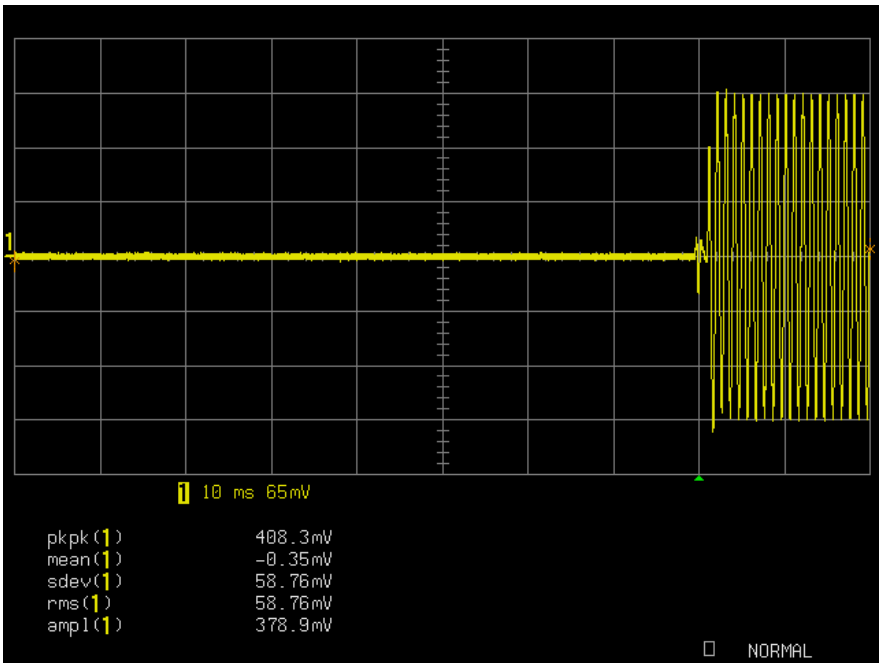
**LOW POWER**

**TRANSIENT FREQUENCY RESPONSE PLOT – 25 kHz**



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**Part 2.1091 RF Exposure Requirements**
**Part 2.1093**

**General information**

FCCID: K95DMH599
Device category: Mobile per Part 2.1091
Environment: Controlled Exposure

Mobile devices that operate under Part 90 of this chapter are subject to routine environmental evaluation for RF exposure prior to equipment authorization or use if they operate at frequencies of 1.5 GHz or below and their effective radiated power (ERP) is 1.5 watts or more. However, compliance with the power density limits of 1.1310 is not required.

**Antenna**

The manufacturer does not specify any antenna to be used with this device.

This device has provisions for operation in a vehicle, or a fixed location.

| Configuration | Antenna p/n | Type | Max. Gain (dBi) |
|---|---|---|---|
| Passenger car | Any | - | 3 |
| | | | |

**Operating configuration and exposure conditions**

The conducted output power is 45 watt. Typical use qualifies for a maximum duty cycle factor of 50%. Part 2.1091 states that devices are excluded from routine evaluation if the EIRP is less than 2.46Watt (or 1.5WERP).

- Vehicle Operation: The maximum antenna gain that can be used is 3dBi. A coaxial cable of the type RG 58 has a loss of 1dB for a length of 15 feet. Distance for compliance is 63 cm.

**MPE Calculation**

The minimum separation distance is calculated as follows:

$$E(V/m) = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power density: } P_d(mW/cm^2) = \frac{E^2}{3770}$$

The limit for general population/uncontrolled exposure environment below 300 MHz is 0.2mW/cm2 for the worst-case frequency.

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## EMC Equipment List

| Device | Manufacturer | Model | Serial Number | Cal/Char Date | Due Date or Status |
|---|---|---|---|---|---|
| 3-Meter OATS | TEI | N/A | N/A | Listed 1/13/03 | 1/12/06 |
| 3/10-Meter OATS | TEI | N/A | N/A | Listed 3/27/04 | 3/26/07 |
| Tan Tower Spectrum Analyzer | HP | 8566B Opt 462 | 3138A07786 3144A20661 | CAL 9/23/03 | 9/23/05 |
| Tan Tower RF Preselector | HP | 85685A | 3221A01400 | CAL 9/23/03 | 9/23/05 |
| Tan Tower Quasi-Peak Adapter | HP | 85650A | 3303A01690 | CAL 9/23/03 | 9/23/05 |
| Tan Tower Preamplifier | HP | 8449B-H02 | 3008A00372 | CAL 9/23/03 | 9/23/05 |
| Blue Tower Spectrum Analyzer | HP | 8568B | 2928A04729 2848A18049 | CAL 4/15/03 | 4/15/05 |
| Blue Tower RF Preselector | HP | 85685A | 2620A00294 | CAL 4/27/04 | 4/27/06 |
| Blue Tower Quasi-Peak Adapter | HP | 85650A | 2811A01279 | CAL 4/15/03 | 4/15/05 |
| Silver Tower Spectrum Analyzer | HP | 8566B Opt 462 | 3552A22064 3638A08608 | CAL 3/22/04 | 3/22/06 |
| Silver Tower RF Preselector | HP | 85685A | 2926A00983 | CAL 3/22/04 | 3/22/06 |
| Silver Tower Quasi-Peak Adapter | HP | 85650A | 3303A01844 | CAL 3/22/04 | 3/22/06 |
| Silver Tower Preamplifier | HP | 8449B | 3008A01075 | CAL 3/22/04 | 3/22/06 |
| Biconnical Antenna | Electro-Metrics | BIA-25 | 1171 | CAL 4/26/01 | 4/26/03 |
| Biconnical Antenna | Eaton | 94455-1 | 1096 | CAL 8/17/04 | 8/17/06 |
| Biconnical Antenna | Eaton | 94455-1 | 1057 | CAL 3/18/05 | 3/18/07 |
| BiconiLog Antenna | EMCO | 3143 | 9409-1043 | No Cal Required | |
| Log-Periodic Antenna | Electro-Metrics | LPA-25 | 1122 | CAL 8/26/04 | 8/26/06 |
| Log-Periodic Antenna | Electro-Metrics | LPA-30 | 409 | CAL 3/4/05 | 3/4/07 |
| Log-Periodic | Eaton | 96005 | 1243 | CAL | 5/8/05 |

| Device | Manufacturer | Model | Serial Number | Cal/Char Date | Due Date or Status |
|---|---|---|---|---|---|
| Antenna | | | | 5/8/03 | |
| Dipole Antenna Kit | Electro-Metrics | TDA-30/1-4 | 152 | CAL 3/21/04 | 3/21/07 |
| Dipole Antenna Kit | Electro-Metrics | TDA-30/1-4 | 153 | CAL 9/26/02 | 9/26/05 |
| Double-Ridged Horn Antenna | Electro-Metrics | RGA-180 | 2319 | CAL 2/17/03 | 2/17/05 |
| Horn Antenna *(at 3 meters) | Electro-Metrics | EM-6961 | 6246 | CAL 3/31/05 | 3/31/07 |
| Horn Antenna *(at 10 meters) | Electro-Metrics | EM-6961 | 6246 | CAL 6/4/03 | 6/4/05 |
| Passive Loop Antenna | EMC Test Systems | EMCO 6512 | 9706-1211 | CHAR 7/10/01 | 7/10/03 |
| Harmonic Mixer with Horn Antenna | Oleson Microwave Labs | M08HW/A | F30425-1 | CHAR 4/25/03 | 4/25/05 |
| Harmonic Mixer with Horn Antenna | Oleson Microwave Labs | M12HW/A | E30425-1 | CHAR 4/25/03 | 4/25/05 |
| LISN | Electro-Metrics | ANS-25/2 | 2604 | CAL 8/27/04 | 8/27/06 |
| LISN | Electro-Metrics | EM-7820 | 2682 | CAL 3/12/05 | 3/12/07 |
| Termaline Wattmeter | Bird Electronic Corporation | 611 | 16405 | CAL 7/16/04 | 7/16/06 |
| Termaline Wattmeter | Bird Electronic Corporation | 6104 | 1926 | CAL 7/16/04 | 7/16/06 |
| Oscilloscope | Tektronix | 2230 | 300572 | CAL 7/3/03 | 7/3/05 |
| System One | Audio Precision | System One | SYS1-45868 | CHAR 4/25/02 | 4/25/04 |
| Temperature Chamber | Tenney Engineering | TTRC | 11717-7 | CHAR 1/22/02 | 1/22/04 |
| AC Voltmeter | HP | 400FL | 2213A14499 | CAL 7/19/04 | 7/19/06 |
| AC Voltmeter | HP | 400FL | 2213A14261 | CHAR 10/15/03 | 10/15/05 |
| AC Voltmeter | HP | 400FL | 2213A14728 | CHAR 10/15/03 | 10/15/05 |
| Digital Multimeter | Fluke | 77 | 35053830 | CHAR 1/8/04 | 1/8/06 |
| Digital Multimeter | Fluke | 77 | 43850817 | CHAR 1/8/04 | 1/8/06 |

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| Device | Manufacturer | Model | Serial Number | Cal/Char Date | Due Date or Status |
|---|---|---|---|---|---|
| Digital Multimeter | HP | E2377A | 2927J05849 | CHAR 1/8/04 | 1/8/06 |
| Multimeter | Fluke | FLUKE-77-3 | 79510405 | CHAR 9/26/03 | 9/26/05 |
| Peak Power Meter | HP | 8900C | 2131A00545 | CAL 7/2/03 | 7/2/05 |
| Power Sensor | Agilent Technologies | 84811A | 2551A02705 | CAL 7/2/03 | 7/2/05 |
| Power Meter | HP | 432A | 1141A07655 | CAL 4/15/03 | 4/15/05 |
| Power Sensor | HP | 478A | 72129 | CAL 4/15/03 | 4/15/05 |
| Power Meter And Sensor | Bird | 4421-107 & 4022 | 0166 & 0218 | CAL 4/16/03 | 4/16/05 |
| Digital Thermometer | Fluke | 2166A | 42032 | CAL 7/19/04 | 7/19/06 |
| Thermometer | Traulsen | SK-128 | | CHAR 1/22/04 | 1/22/06 |
| Thermometer | Extech | 4028 | 14871-2 | CAL 3/7/05 | 3/7/07 |
| Hygro-Thermometer | Extech | 445703 | 0602 | CAL 10/4/02 | 10/4/04 |
| Frequency Counter | HP | 5352B | 2632A00165 | CAL 8/3/04 | 8/3/06 |
| Frequency Counter | HP | 5385A | 2730A03025 | CAL 3/7/05 | 3/7/07 |
| Service Monitor | IFR | FM/AM 500A | 5182 | CAL 11/22/00 | Out of Service |
| Comm. Serv. Monitor | IFR | FM/AM 1200S | 6593 | CAL 5/12/04 | 5/12/06 |
| Signal Generator | HP | 8640B | 2308A21464 | CAL 8/26/04 | 8/26/06 |
| Sweep Generator | Wiltron | 6648 | 101009 | CAL 4/15/03 | 4/15/05 |
| Sweep Generator | Wiltron | 6669M | 007005 | CAL 3/3/05 | 3/3/07 |
| Modulation Analyzer | HP | 8901A | 3435A06868 | CAL 9/5/01 | 9/5/03 |
| Modulation Meter | Boonton | 8220 | 10901AB | CAL 4/15/03 | 4/15/05 |
| Near Field Probe | HP | HP11940A | 2650A02748 | CHAR 2/1/01 | Out of Service |
| BandReject Filter | Lorch | 5BR4- | Z1 | CHAR | 4/17/05 |

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| Device | Manufacturer | Model | Serial Number | Cal/Char Date | Due Date or Status |
|---|---|---|---|---|---|
| | Microwave | 2400/60-N | | 4/17/03 | |
| BandReject Filter | Lorch Microwave | 6BR6-2442/300-N | Z1 | CHAR 4/17/03 | 4/17/05 |
| BandReject Filter | Lorch Microwave | 5BR4-10525/900-S | Z1 | CHAR 4/12/03 | 4/12/05 |
| Notch Filter | Lorch Microwave | 5BRX-850/X100-N | AD-1 | CHAR 4/17/03 | 4/17/05 |
| High Pass Filter | Unk | 3768(5)-400 | 041 | CHAR 12/17/04 | 12/17/06 |
| High Pass Filter | Microlab | HA-10N | | CHAR 11/17/04 | 11/17/06 |
| High Pass Filter | Microlab | HA-20N | | CHAR 12/17/04 | 12/17/06 |
| Audio Oscillator | HP | 653A | 832-00260 | CHAR 12/1/04 | 12/1/06 |
| Audio Generator | B&K Precision | 3010 | 8739686 | CHAR 12/1/04 | 12/1/06 |
| Frequency Counter | HP | 5382A | 1620A03535 | CHAR 3/2/01 | Out of Service |
| Frequency Counter | HP | 5385A | 3242A07460 | CAL 3/7/05 | 3/7/07 |
| Amplifier | HP | 11975A | 2738A01969 | No Cal Required | |
| Egg Timer | Unk | | | CHAR 2/1/04 | 2/1/06 |
| Measuring Tape-20M | Kraftixx | 0631-20 | | CHAR 2/1/04 | 2/1/06 |
| Measuring Tape-7.5M | Kraftixx | 7.5M PROFI | | CHAR 2/1/04 | 2/1/06 |
| Coaxial Cable #51 | Insulated Wire Inc. | NPS 2251-2880 | Timco #51 | CHAR 1/23/04 | 1/23/06 |
| Coaxial Cable #64 | Semflex Inc. | 60637 | Timco #64 | CHAR 1/24/04 | 1/24/06 |
| Coaxial Cable #65 | General Cable Co. | E9917 RG233/U | Timco #65 | CHAR 1/23/04 | 1/23/06 |
| Coaxial Cable #106 | Unknown | Unknown | Timco #106 | CHAR 1/23/04 | 1/23/06 |
| Injection Probe | Fischer Custom Communications | F-120-9A | 270 | CAL 6/1/03 | 6/1/05 |
| Power Line Coupling/Decoupling Network | Fischer Custom Communications | FCC-801-M2-16A | 01048 | CAL 8/29/05 | 8/29/05 |
| Power Line | Fischer Custom | FCC-801-M3- | 01060 | CAL | 8/29/05 |

| Device | Manufacturer | Model | Serial Number | Cal/Char Date | Due Date or Status |
|---|---|---|---|---|---|
| Coupling/Decoupling Network | Communications | 16A | | 8/29/03 | |
| VHF/UHF Current Probe | Fischer Custom Communications | F-52 | 130 | CAL 8/30/03 | 8/30/05 |
| Passive Impedance Adapter | Fischer Custom Communications | FCC-801-150-50-CDN | 01117 & 01118 | CAL 8/29/03 | 8/29/05 |
| Radiating Field Coil | Fischer Custom Communications | F-1000-4-8/9/10-L-1M | 9859 | CAL 10/15/03 | 10/15/05 |
| EMC Immunity Test System | Keytek | CEMASTER | 9810210 | CAL 2/1/04 | 2/1/05 |
| Compliance Test System - AC Power Source | California Instruments | 1251RP | L05865 | CAL 2/25/04 | 2/25/06 |
| Compliance Test System - PACS-1 Module | California Instruments | PACS-1 | X71484 | CAL 2/25/04 | 2/25/06 |
| Isotropic Field Probe | Amplifier Research | FP5000 | 22839 | | |
| Isotropic Field Probe | Amplifier Research | FP5000 | 300103 | | |
| Capacitor Clamp | Keytek | CM-CCL | 9811359 | No Cal Required | |
| Amplifier | Amplifier Research | 10W1000B | 23117 | No Cal Required | |
| Field Monitor | Amplifier Research | FM5004 | 22288 | No Cal Required | |
| ELF Meter | F. W. Bell | 4060 | Not Serialized | | Out of Service |
| Standard Gain Horn 1.0-2.4 GHz | Polarad | CA-L | 235 | No Cal Required | |
| Standard Gain Horn 2.14-4.34 GHz | Polarad | CA-S | 203 | No Cal Required | |
| Standard Gain Horn 3.95-5.85 GHz | Scientific-Atlanta Inc. | 11A-3.9 | 8448CG | No Cal Required | |
| Standard Gain Horn 8.2-12.5 GHz | Systron Donner | DBG-520-20 | Not Serialized | No Cal Required | |
| Standard Gain Horn 18.0-26.3 GHz | Systron Donner | DBE-520-20 | Not Serialized | No Cal Required | |
| Standard Gain Horn 26.5-40.2 GHz | Systron Donner | DBD-520-20 | Not Serialized | No Cal Required | |
| Standard Gain Horn 40.0-60.0 GHz | ATM | 19-443-6R | Not Serialized | No Cal Required | |
| Double-Ridged Horn | EMCO | 3116 | 9011-2145 | | Out of |

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| Device | Manufacturer | Model | Serial Number | Cal/Char Date | Due Date or Status |
|---|---|---|---|---|---|
| Antenna | | | | | Service |
| Standard Gain Horn 12.4-18.0 GHz | ATM | 62-442-6 | D262108-01 | No Cal Required | |
| Standard Gain Horn 5.85-8.2 GHz | ATM | 137-442-2 | D261908-01 | No Cal Required | |
| AC Voltmeter | HP | 400F | 0950A05433 | CAL 8/13/03 | 8/13/05 |
| RF Power Amplifier | Ophir RF | 5150F | 1041 'X1' | No Cal Required | |
| Electric Field Sensor | Amplifier Research | FP6001 | 302504 | | |
| Electric Field Sensor | Amplifier Research | FP6001 | 302510 | CAL 6/1/04 | 6/1/06 |
| Surge Generator | Com-Power Corporation | SG-168 | 25802 | CAL 2/27/04 | 2/27/06 |
| RF Power Amplifier | Ophir RF, Inc. | 5150F | 1041 | CHAR 10/31/03 | 10/31/05 |
| 3-Meter Anechoic Chamber | Panashield | N/A | N/A | Listed 5/12/04 | 5/11/07 |
| Digital Multimeter | Fluke | 77III | 79510408 | CAL 7/19/04 | 7/19/06 |
| Open-Frame Tower Spectrum Analyzer | HP | 8566B/85662A | 2627A03154/2648A14276 | CAL 7/9/04 | 7/9/06 |
| Open-Frame Tower RF Preselector | HP | 85685A | 3107A01282 | CAL 7/9/04 | 7/9/06 |
| Open-Frame Tower Quasi-Peak Adapter | HP | 85650A | 2046A00305 | CAL 7/9/04 | 7/9/06 |
| Signal Generator | HP | 8648C | 3847A04696 | CAL 9/27/04 | 9/27/06 |