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849 NW State Road 45
Newberry, Florida 32669
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Test Report

Product Name: GPS-ENABLED MODEM

FCC ID: Q4I1600

Applicant:

ELUTIONS, INC.
5905 BRECKENRIDGE PARKWAY, SUITE F
TAMPA FLORIDA 33610
USA

Date Receipt: JUNE 23, 2004

Date Tested: JULY 7, 2004

APPLICANT: ELUTIONS, INC.
FCC ID: Q4I1600
REPORT #: E\ELUTIONS, INC._\929UT4\929UT4TestReport.doc

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TABLE OF CONTENTS LIST

APPLICANT: ELUTIONS, INC.

FCC ID: Q4I1600

TEST REPORT:

EXHIBITS CONTAINING:

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GENERAL INFORMATION REQUIRED
FOR TYPE ACCEPTANCE

2.1033(c)(1)(2) ELUTIONS, INC. will manufacture the FCCID: Q4I1600 VHF TRANSCEIVER in quantity, for use under FCC RULES PART 90.

ELUTIONS, INC.
5905 BRECKENRIDGE PARKWAY, SUITE F
TAMPA, FLORIDA 33610

2.1033(c) **TECHNICAL DESCRIPTION**

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

2.1033(c) (4) 90.209 Type of Emission: 18K3D7W

2.1033(c)(5) 90.209 Frequency Range: 806-825 MHz, 896-901 MHz

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

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

	800MHz	800MHz	900MHz	900HMz
	MAXIMUM POWER	MINIMUM POWER	MAXIMUM POWER	MINIMUM POWER
DC VOLTAGE	4 Volts	4 Volts	4 Volts	4 Volts
DC CURRENT	4.2 Amps	0.44 Amps	1.25 Amps	0.44 Amps

2.1033(c)(9) Tune-up procedure. The tune-up procedure is included in the exhibits.

2.1033(c)(10) Complete Circuit Diagrams: The circuit diagram and block diagram are included in the exhibits.

(11) Function of each semiconductor device or other active circuit device see the exhibits.

(12) Description of all circuitry and devices provided for determining and stabilizing frequency is included in the circuit description in the instruction manual.

2.1033(c)(13) A photograph or drawing of the equipment identification label is shown in the exhibits.

2.1033(c)(14) Photographs of the equipment of sufficient clarity to reveal equipment construction and layout and label location are shown in the exhibits.

2.1033(c)(13) For equipment employing digital modulation, a detailed description of the modulation technique. Digitally encoded speech or digital data is transmitted in four sub-channels at a 4 kHz rate using M-ary symbols mapped to predetermined fixed magnitude and phase components within 1 of 3 constellations associated with a particular modulation scheme. Figure 2 illustrates symbol mapping to one of the four QPSK sub-channels constellations. Figure 3 illustrates symbol mapping to one of the four 16QAM sub-channels constellation. Figure 4 illustrates symbol mapping to one of the four 64QAM sub-channels constellation. For Quad-QPSK modulation, this mapping adjusts the amplitude and phase variations of the baseband signal to one of 4 points on the constellation. For Quad-16QAM modulation, this mapping adjusts the amplitude and phase variations of the baseband signal to one of 16 points on the constellation. For Quad-64 modulation, this mapping adjusts the amplitude and phase variations of the baseband signal to one of 64 points on the constellation. The bandwidth of the modulating signals is limited by the pair of modulation limiting low pass filters in U801. These filters serve to limit out-of-band and spurious emissions due to modulation. The necessary bandwidth of the sub-channels is limited to 4.8 kHz by the pair of modulation limiting low pass filters. The transfer response of these filters is depicted in Figure 1 where the filter excess bandwidth coefficient of 0.2 is shown. This excess bandwidth leads to the necessary bandwidth calculation of (1 + 0.2) x (4 kHz) = 4.8 kHz. Since the sub-channels are spaced 4.5 kHz apart, the necessary bandwidth of the composite 4 sub-channel symbol streams is 4.8 + (3 x 4.5) = 18.3 kHz.

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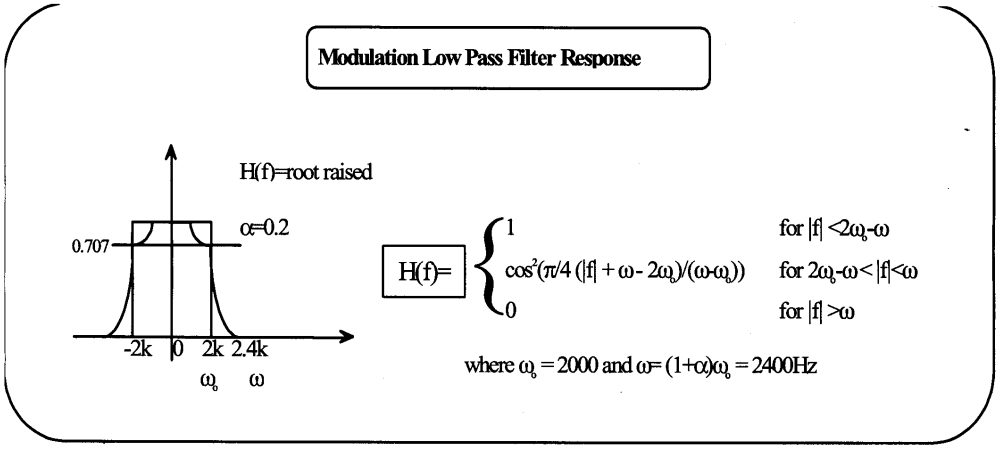
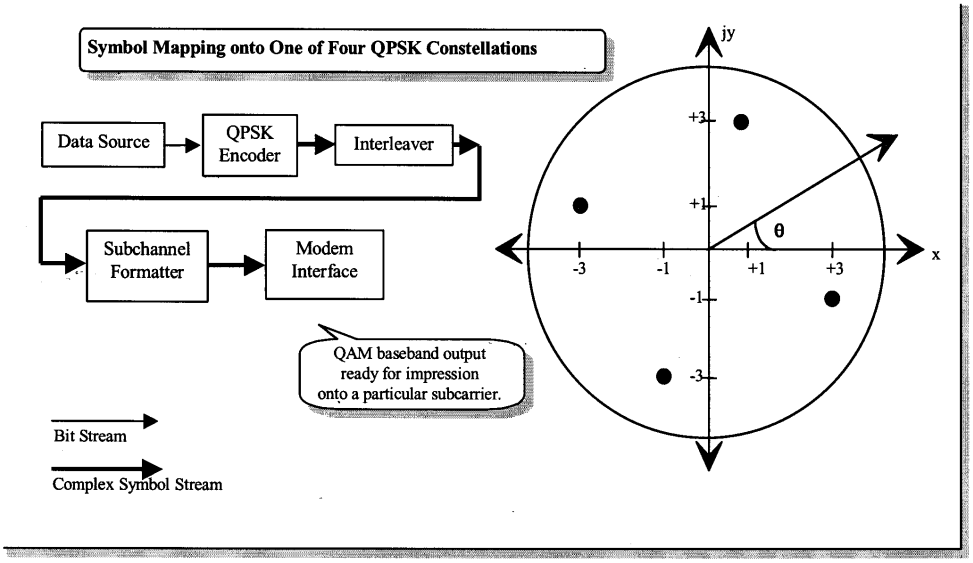


Modulation Low Pass Filter Response



Symbol Mapping onto One of Four QPSK Constellations

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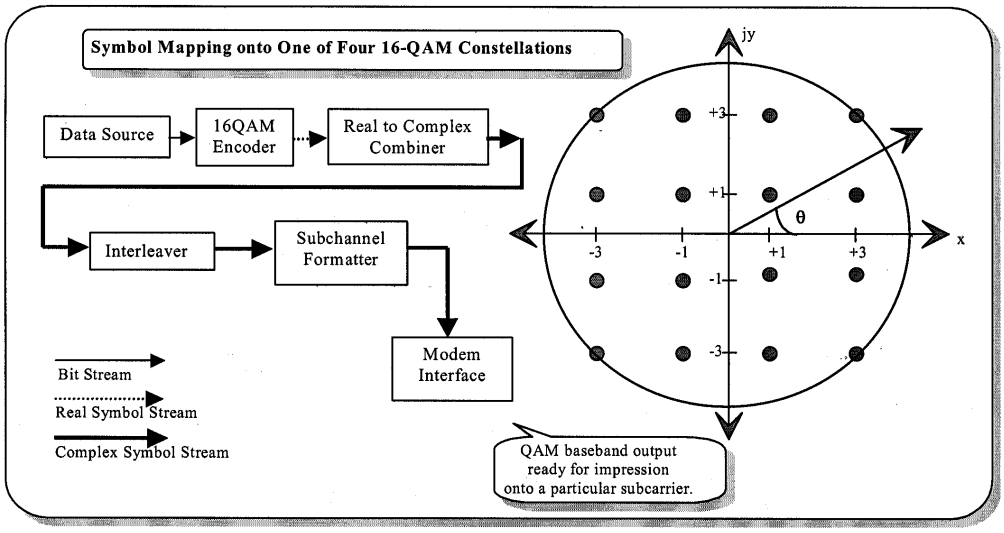
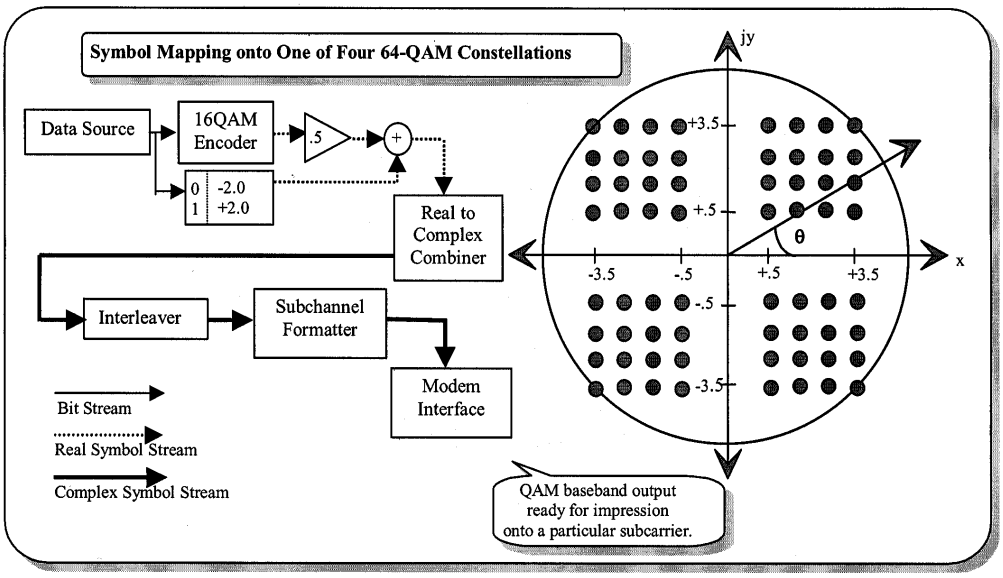


Symbol Mapping onto One of Four 16-QAM Constellations



Symbol Mapping onto One of Four 64-QAM Constellations

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2.1033(c)(16) The data required for 2.1046 through 2.1057 is submitted below.

2.1046(a) **RF POWER OUTPUT**

RF power is measured by connecting a 50-ohm, resistive wattmeter to the RF output connector. With a nominal battery voltage of 4 VDC, and the transmitter properly adjusted the RF output measures:

The transmitter is a variable power type used in a SMR trunking system. Output power(as defined in 47 CFR 90.7) is dynamically controlled by sensing the quality of the received base station signal, then automatically adjusting an attenuator in approx. 1 dB steps over the range from 0 to 34 dB attenuation.

OUTPUT POWER: HIGH – 0.60 Watts
LOW - 0.58 Watts

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2.1047(a) **Voice Modulation characteristics:**
NOT APPLICABLE

2.1049 **Occupied bandwidth:**

90.210(c,)

a.) Per 47CFR 90.210(g)

(1) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 5 kHz up to and including 10 kHz:

At least 83 log10(fd/5) decibels.

(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 10 kHz up to and including 250 percent of the authorized bandwidth:

At least 116 log10 (fd/6.1) decibels or 50 plus 10 log10 (Un-modulated Carrier Power) decibels or 70 decibels, whichever is lesser attenuation.

(3) On any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth:

At least 43 plus 10 log10 (Output Power in Watts) decibels or 80 decibels, whichever is lesser attenuation.

b.) Per EA SMR Emission Mask, 47 CFR 90.691(a)

Out-of-band emission requirement shall apply only to the "outer" channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees.

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 log10(f/6.1) decibels or 50 + 10 log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center channel of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) decibels (i.e. –13 dBm) or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

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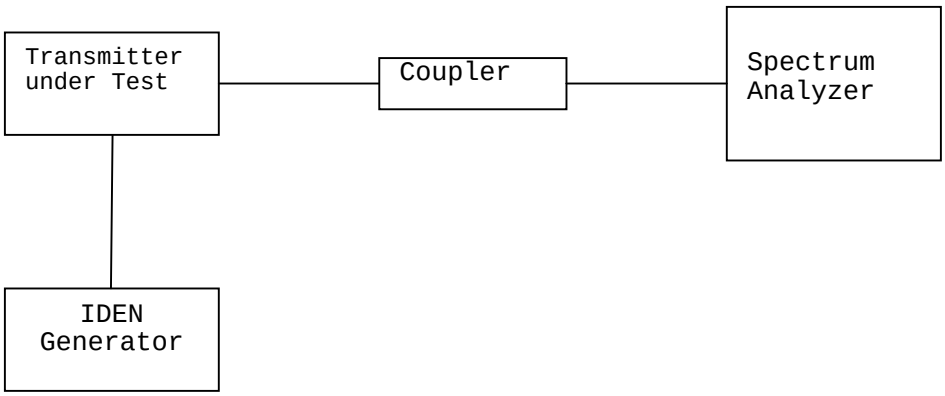
Test procedure: TIA/EIA-603 para 2.2.11, with the exception that The IDEN waveform was used.

Test procedure diagram

OCCUPIED BANDWIDTH MEASUREMENT



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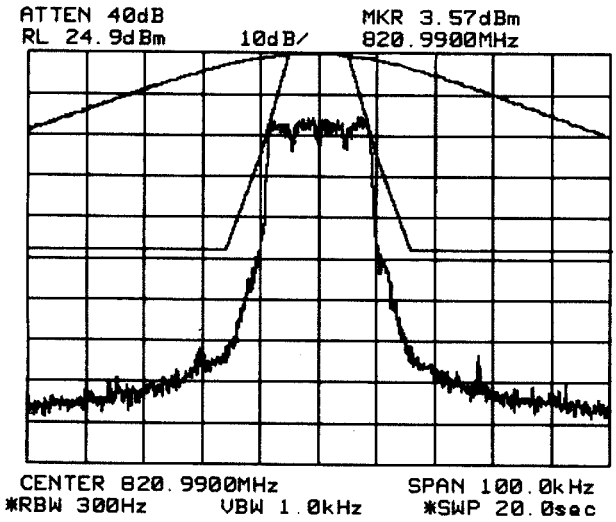
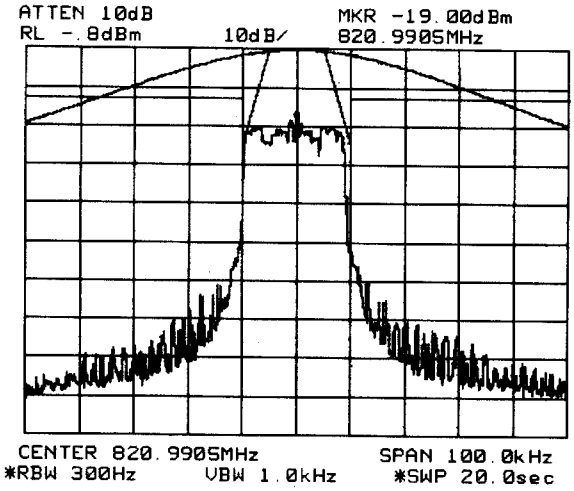
OCCUPIED BANDWIDTH PLOT
QUAD-QPSK MASK 47 CFR 90.210 (g)
MAXIMUM POWER



QUAD-QPSK MASK 47 CFR 90.210 (g)
MINIMUM POWER



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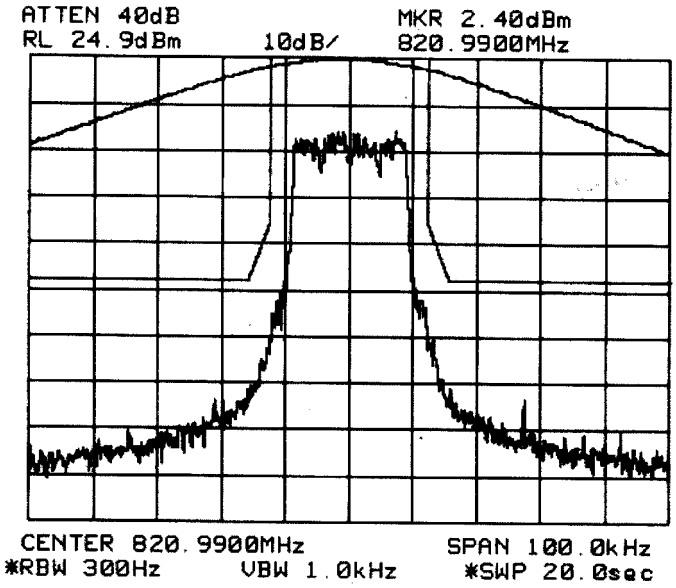
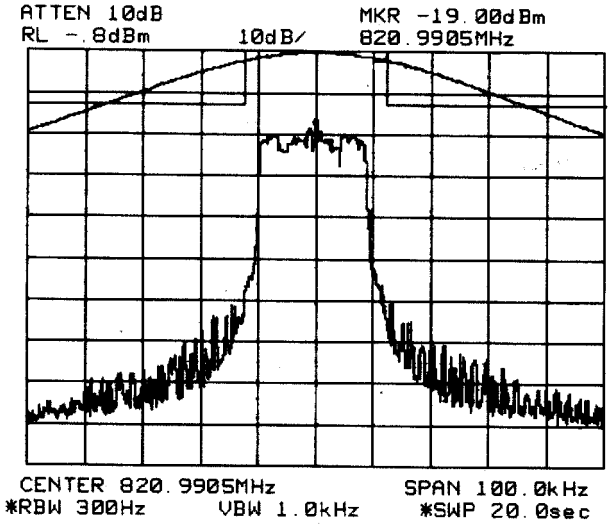
OCCUPIED BANDWIDTH
QUAD-QPSK MASK 47 CFR 90.691
MAXIMUM POWER



QUAD-QPSK MASK 47 CFR 90.691
MINIMUM POWER



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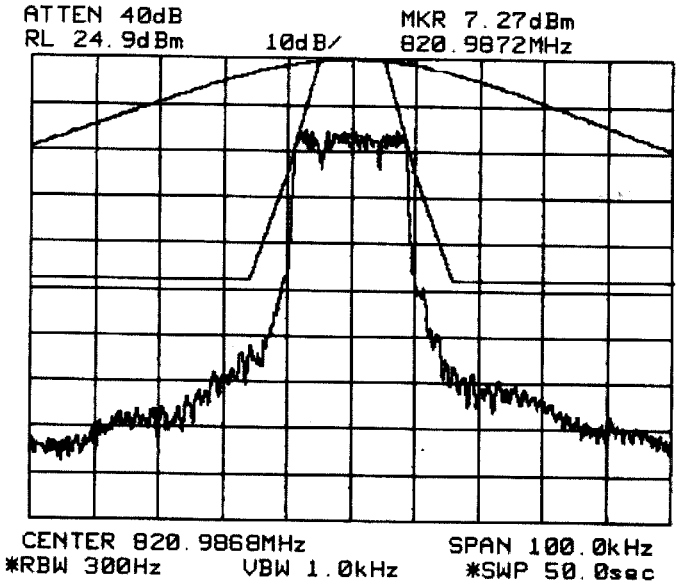
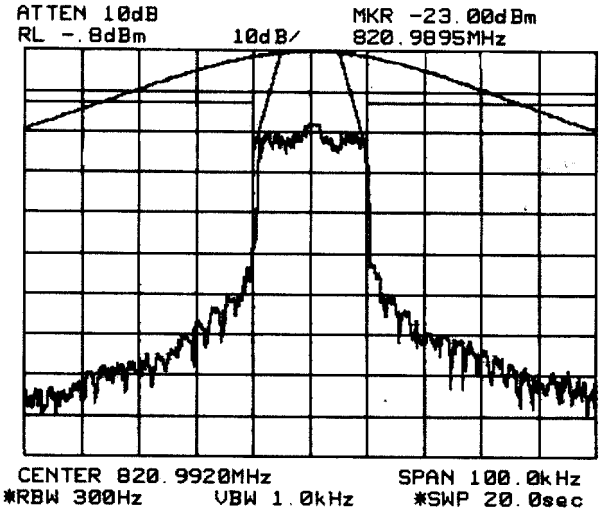
OCCUPIED BANDWIDTH

QUAD-16QAM MASK 47 CFR 90.210 (g)
MAXIMUM POWER



QUAD-16QAM MASK 47 CFR 90.210 (g)
MINIMUM POWER



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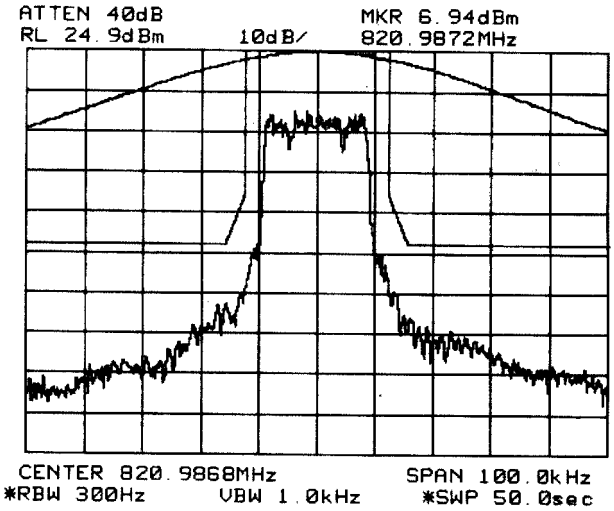
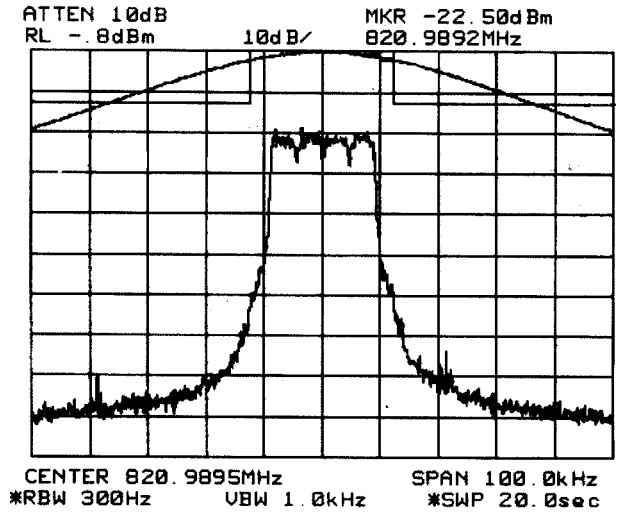
OCCUPIED BANDWIDTH

QUAD-16QAM MASK 47 CFR 90.691
MAXIMUM POWER



QUAD-16QAM MASK 47 CFR 90.691
MINIMUM POWER



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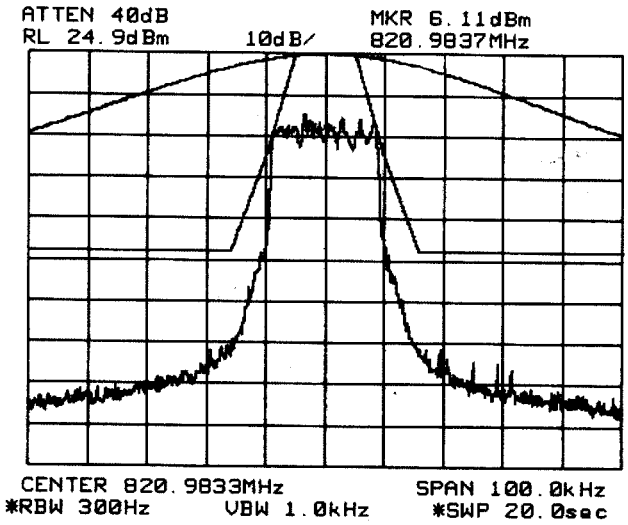
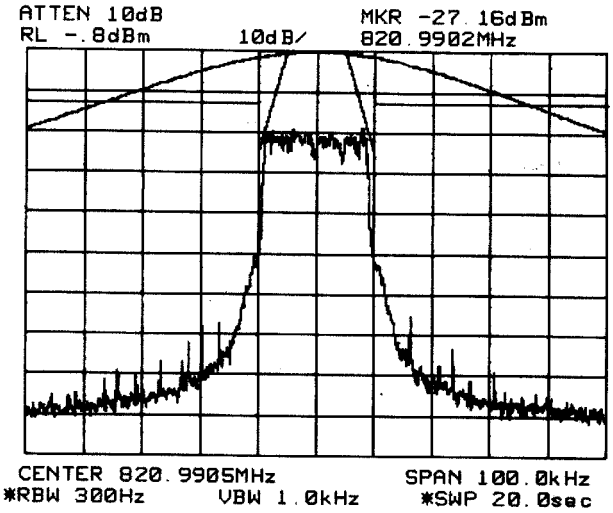
OCCUPIED BANDWIDTH

QUAD-64QAM MASK 47 CFR 90.210 (g)
MAXIMUM POWER



QUAD-64QAM MASK 47 CFR 90.210 (g)
MINIMUM POWER



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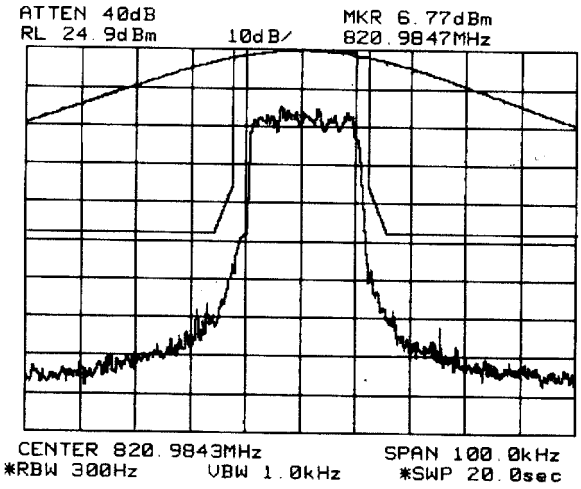
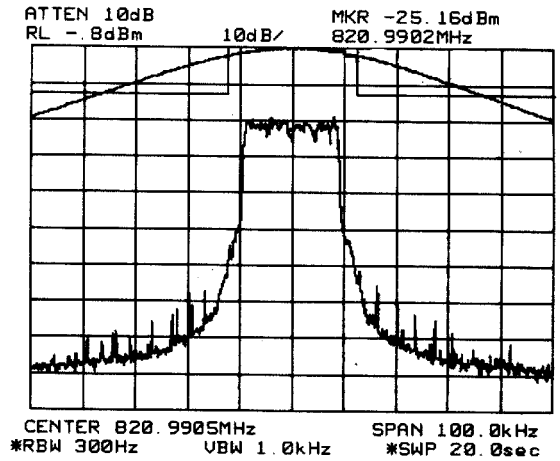
OCCUPIED BANDWIDTH
QUAD-64QAM MASK 47 CFR 90.691
MAXMIMUM POWER



QUAD-64QAM MASK 47 CFR 90.691
MINIMUM POWER



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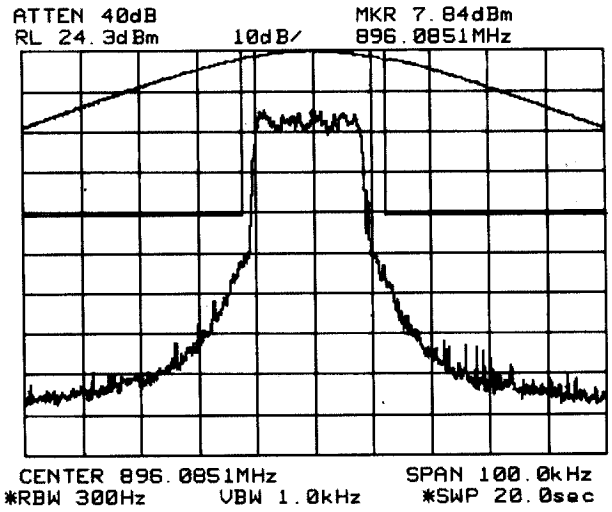
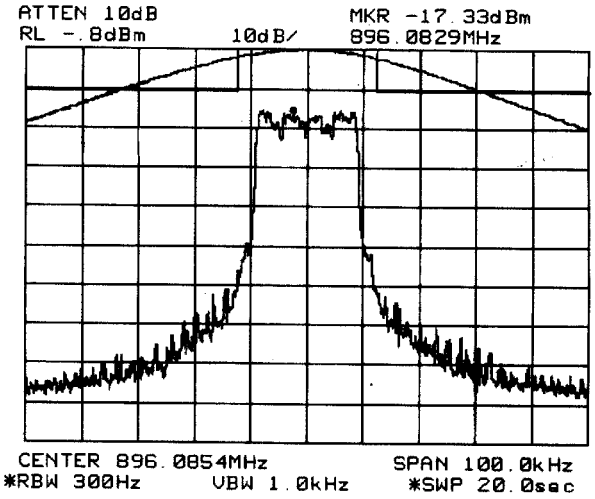
OCCUPIED BANDWIDTH
QUAD-QPSK MASK 47 CFR 90.669 (a)
MAXIMUM POWER



QUAD-QPSK MASK 47 CFR 90.669 (a)
MINIMUM POWER



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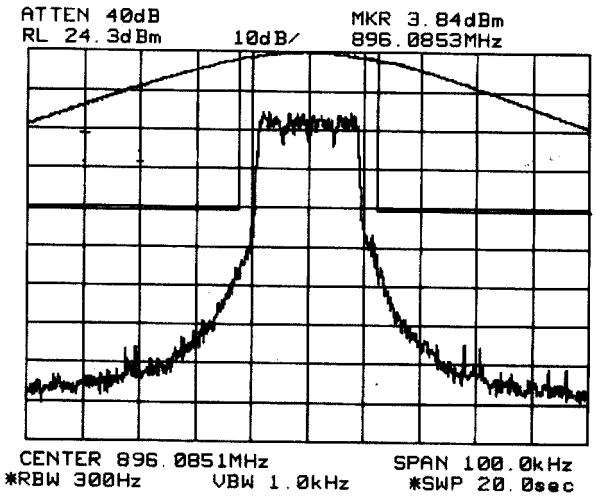
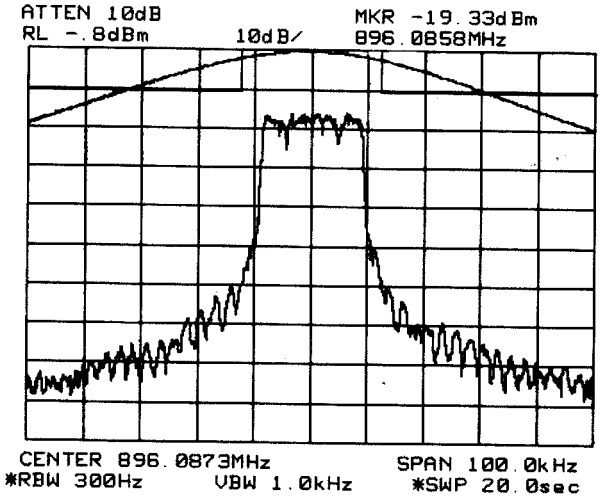
OCCUPIED BANDWIDTH
QUAD-16QAM MASK 47 CFR 90.669 (a)
MAXIMUM POWER



QUAD-16QAM MASK 47 CFR 90.669 (a)
MINIMUM POWER



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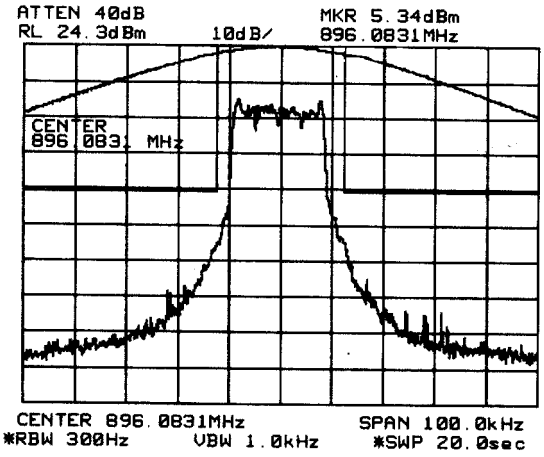
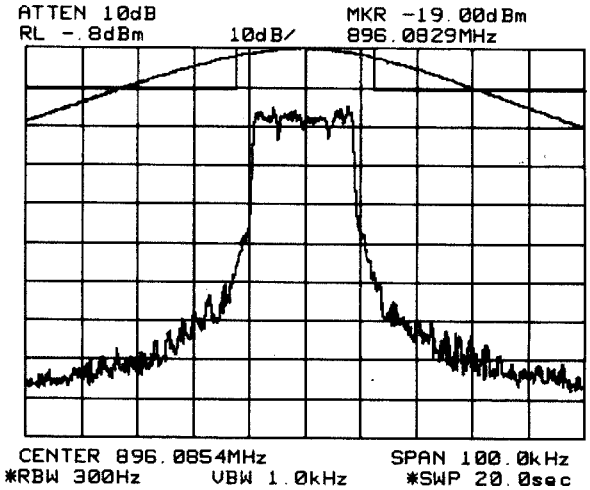
OCCUPIED BANDWIDTH
QUAD-64QAM MASK 47 CFR 90.669 (a)
MAXIMUM POWER



QUAD-64QAM MASK 47 CFR 90.669 (a)
MINIMUM POWER



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2.1051 **Spurious emissions at antenna terminals (conducted):**

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.

REQUIREMENTS: Emissions must be 43 + 10log(Po) dB below the mean power output of the transmitter.

43 + 10log(.58) = 40.63

TF LOW POWER	EF	dB below carrier	TF HIGH POWER	EF	dB below carrier
806	806	0	806	806	0
	1612.1	61.7		1612.1	57.8
	2418.2	*		2418.2	71.3
	3224.2	*		3224.2	71.2

TF LOW POWER	EF	dB below carrier	TF HIGH POWER	EF	dB below carrier
813.5	813.5	0	813.5	813.5	0
	1627.1	62.9		1627.1	59.6
	2440.7	*		2440.7	70.5
	3254.2	*		3254.2	74

TF LOW POWER	EF	dB below carrier	TF HIGH POWER	EF	dB below carrier
820.9	820.9	0	820.9	820.9	0
	1642.0	69.8		1642.0	60.6
	2463.0	*		2463.0	75
	3284.0	*		3284.0	74.2

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2.1052 **Spurious emissions at antenna terminals (conducted):**

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.

REQUIREMENTS: Emissions must be 43 + 10log(Po) dB below the mean power output of the transmitter.

43 + 10log(.6) = 40.78

TF LOW POWER	EF	dB below carrier	TF HIGH POWER	EF	dB below carrier
896.00	154.65	0	896.00	154.65	0
	1792.04	*		1792.04	57
	2688.06	*		2688.06	71
	3584.08	*		3584.08	71

TF LOW POWER	EF	dB below carrier	TF HIGH POWER	EF	dB below carrier
900.98	154.65	0	900.98	154.65	0
	1801.96	*		1801.96	59
	2702.94	*		2702.94	72
	3603.93	*		3603.93	74

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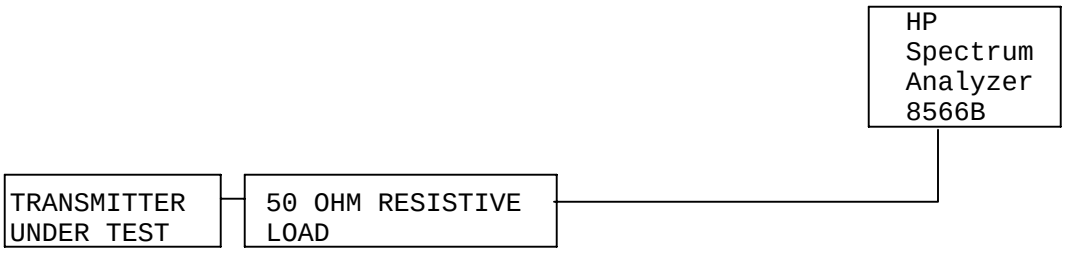
Method of Measuring Conducted Spurious Emissions



METHOD OF MEASUREMENT: The procedure used was TIA/EIA-603 STANDARD without any exceptions. An audio generator was connected to the UUT through a dummy microphone circuit and the output of the transmitter connected to a standard load and from the standard load through a pre-selector filter of the spectrum analyzer. The spectrum was scanned from 400 kHz to at least the tenth harmonic of the fundamental using a HP model 8566B spectrum analyzer. The measurements were made using the shielded room located at TIMCO ENGINEERING INC. 849 N.W. State Road 45, Newberry, Florida 32669.

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2.1053 **Field strength of spurious emissions:**

NAME OF TEST: **RADIATED SPURIOUS EMISSIONS**

REQUIREMENTS: Emissions must be 50 + 10log(Po) dB below the mean power output of the transmitter.

806 – 825 MHz: 50 + 10log(0.58) = 47.63 dB
896 – 902 MHz: 50 + 10log(0.60) = 47.78 dB

TEST DATA:

EMISSION FREQUENCY MHz	METER READING	V or H	dBc	COAX LOSS dB	CORRECTED SIGNAL GENERATOR LEVEL dBm	DIPOLE CORRECTION FACTOR
806.00	96.0	V	0	0	29.3	0
1612.00	28.5	V	70.9	1.1	-41.6	5
2418.00	17.0	V	77.16	1.3	-47.86	5.24
3224.00	14.1	V	70.45	1.35	-41.15	7.3
813.50	95.2	V	0	0	28.5	0
1627.00	27.4	V	71.2	1.1	-42.7	5
2440.50	16.7	V	76.66	1.3	-48.16	5.24
3254.00	15.6	V	68.15	1.35	-39.65	7.3
821.00	95.3	V	0	0	28.6	0
1642.00	27.0	V	67.6	1.1	-40.8	5
2463.00	15.9	V	78.16	1.3	-51.36	5.24
3284.00	15.7	V	82.05	1.35	-55.25	7.3
896.00	95.5	V	0	0	28.8	0
1792.00	27.6	V	71.8	1.1	-43	5
2688.00	17.0	V	74.8	1.3	-46	6.85
3584.00	14.5	V	69.8	1.35	-41	7.3
902.00	94.90	V	0	0	28.2	0
1804.00	27.0	V	71.2	1.1	-43	5
2706.00	16.3	V	75.2	1.3	-47	6.85
3608.00	15.8	V	67.2	1.40	-39	7.55

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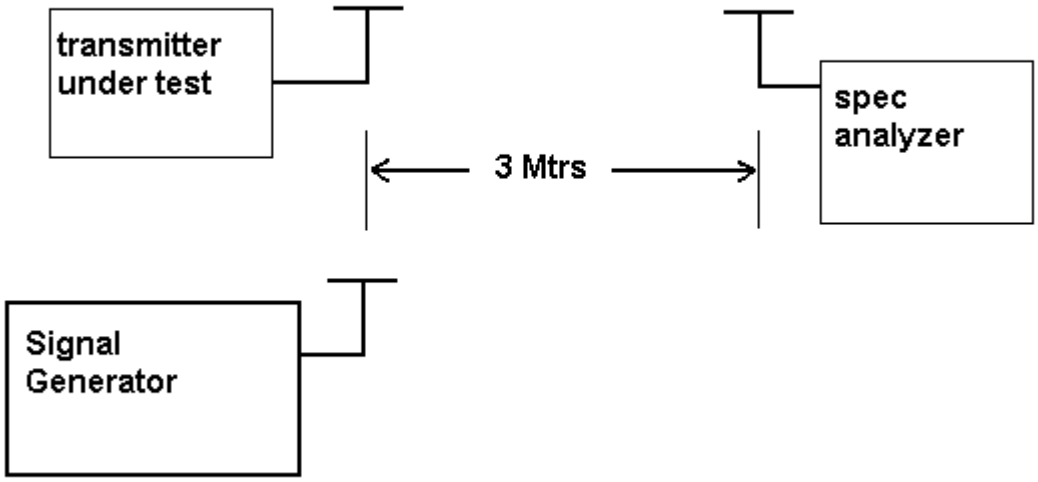
Method of Measuring Radiated Spurious Emissions



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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2.1055 **Frequency stability:**

90.213(a)(1)

Because of the transmitter's dependence on the stability of the base station oscillator, it is not possible to provide stability data for this transmitter as is commonly supplied for certification per 47 CFR 2.1055 for a radio with a locally stabilized oscillator.

The following information is provided to clarify how the transmitter attains the necessary accuracy of 2.5 PPM or better for 800MHz band operation and 1.5PPM or better for 900MHz band operation. The transmitter's suppressed carrier emission is produced by mixing of a modulated intermediate frequency with a higher, digitally synthesized injection frequency with a resolution of 12.5 kHz. Both of these frequencies are derived from a temperature compensated crystal oscillator (Y300). Transmission frequency accuracy is enhanced by the radio receiver circuitry, which causes the radio operating frequency to become locked to within 0.4 PPM of the base station once it has acquired the primary control channel. Thus the temperature and voltage frequency stability of the transmitter is within 0.4 PPM accuracy of the higher stability base station oscillator. The AFC routine and frequency locking mechanism are implemented using both hardware and software. The hardware and software combined provide an automatic frequency control function which locks the receiver to within 0.4 PPM of the control channel oscillator.

Since the base station stability is FCC regulated to be 1.5 PPM or better for the 800MHz band and 0.1 PPM or better for the 900MHz band, the absolute accuracy of the transmitter is inherently better than 1.9 PPM in the 800MHz band and 0.5 PPM in the 900MHz band. This is accomplished by programming U600 while the radio is in operation.

Transmitter frequency stability is guaranteed over all specified environmental operating conditions (battery voltage, temperature, humidity, etc.) because of the nature of the base station frequency locking mechanism. The frequency stability of the transmitter is maintained until the battery voltage drops below 3.55 volts. Any voltage below 3.55 volts is outside the specified operating range of the transmitter and linearity is degraded below 3.55 volts. For this reason, the radio shuts down (while in transmit mode) when the voltage drops below 3.55 volts.

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Note: Frequency stability is independent of modulation scheme (Quad –QPSK, Quad-16QAM, Quad-64QAM). The data shown in following tables was taken with the radio set to transmit a Quad-16QAM signal at 813.0625 and 899.48125 MHz while locked to a service monitor.

Readings were also taken at the end point of the battery voltage of 4.0 Vdc.

MEASUREMENT DATA:

Temperature (Degrees C)	Frequency Error (Hz)		Frequency Error (PPM)	
	800 MHz	900 MHz	800 MHz	900 MHz
-30	32	21	0.039	0.023
-20	23	59	0.028	0.066
-10	31	44	0.038	0.049
0	4	20	0.005	0.022
10	17	54	0.021	0.060
20	35	4	0.043	0.004
30	8	65	0.010	0.072
40	26	9	0.032	0.010
50	21	2	0.026	0.002
60	37	44	0.046	0.049

Power Supply Voltage (V)	Frequency Error (Hz)		Frequency Error (PPM)	
	800 MHz	900 MHz	800 MHz	900 MHz
4.3	29	12	0.036	0.013
4.2	41	46	0.050	0.051
4.1	2	13	0.002	0.014
4	22	36	0.027	0.040
3.9	57	39	0.070	0.043
3.8	42	26	0.052	0.029
3.7	36	23	0.044	0.026
3.6	0	18	0.000	0.020

RESULTS OF MEASUREMENTS: The maximum frequency variation over the temperature range was +0.046 ppm for the 800 MHz band and +0.072 ppm for the 900 MHz band.

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EMC Equipment List

	DEVICE	MFGR	MODEL	SERNO	CAL/CHAR DATE	DUE DATE or STATUS
X	3-Meter OATS	TEI	N/A	N/A	Listed 1/13/03	1/13/06
	3/10-Meter OATS	TEI	N/A	N/A	Listed 3/26/01	3/26/04
	Receiver, Beige Tower					
	Spectrum Analyzer	HP	8566B Opt 462	3138A07786 3144A20661	CAL 8/31/01	8/31/03
	RF Preselector	HP	85685A	3221A01400	CAL 8/31/01	8/31/03
	Quasi-Peak Adapter	HP	85650A	3303A01690	CAL 8/31/01	8/31/03
X	Receiver, Blue Tower					
X	Spectrum Analyzer	HP	8568B	2928A04729 2848A18049	CAL 4/15/03	4/15/05
X	RF Preselector	HP	85685A	2926A00983	CAL 4/15/03	4/15/05
X	Quasi-Peak Adapter	HP	85650A	2811A01279	CAL 4/15/03	4/15/05
	Receiver, Silver/Grey Tower					
	Spectrum Analyzer	HP	8566B Opt 462	3552A22064 3638A08608	CAL 10/14/02	10/14/04
	RF Preselector	HP	85685A	2620A00294	CAL 10/14/02	10/14/04
	Quasi-Peak Adapter	HP	85650A	3303A01844	CAL 10/14/02	10/14/04
	Preamplifier	HP	8449B	3008A01075	CHAR 1/28/02	1/28/04
X	Biconnical Antenna	Electro-Metrics	BIA-25	1171	CAL 4/26/01	4/26/03
	Biconnical Antenna	Eaton	94455-1	1096	CAL 10/1/01	10/1/03
	Biconnical Antenna	Eaton	94455-1	1057	CAL 3/18/03	3/18/05
	BiconiLog Antenna	EMCO	3143	9409-1043		
X	Log-Periodic Antenna	Electro-Metrics	LPA-25	1122	CAL 10/2/01	10/2/03
	Log-Periodic Antenna	Electro-Metrics	EM-6950	632	CHAR 10/15/01	10/15/03
	Log-Periodic Antenna	Electro-Metrics	LPA-30	409	CAL 3/4/03	3/4/05

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	DEVICE	MFGR	MODEL	SERNO	CAL/CHAR DATE	DUE DATE or STATUS
	Dipole Antenna Kit	Electro-Metrics	TDA-30/1-4	152	CAL 3/21/01	3/21/04
	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	Electro-Metrics	EM-6961	6246	CAL 3/31/03	3/31/05
	Horn Antenna	ATM	19-443-6R	None	No Cal Required	
	Passive Loop Antenna	EMC Test Systems	EMCO 6512	9706-1211	CHAR 7/10/01	7/10/03
	Line Impedance Stabilization . . .	Electro-Metrics	ANS-25/2	2604	CAL 10/9/01	10/9/03
	Line Impedance Stabilization . . .	Electro-Metrics	EM-7820	2682	CAL 3/12/03	3/12/05
	Termaline Wattmeter	Bird Electronic Corporation	611	16405	CAL 5/25/99	5/25/01
	Termaline Wattmeter	Bird Electronic Corporation	6104	1926	CHAR 12/12/01	12/12/03
	Oscilloscope	Tektronix	2230	300572	CHAR 2/1/01	2/1/03
	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 10/9/01	10/9/03
	AC Voltmeter	HP	400FL	2213A14261	CHAR 10/15/01	10/15/03
	AC Voltmeter	HP	400FL	2213A14728	CHAR 10/15/01	10/15/03
X	Digital Multimeter	Fluke	77	35053830	CHAR 1/8/02	1/8/04
	Digital Multimeter	Fluke	77	43850817	CHAR 1/8/02	1/8/04
	Digital Multimeter	HP	E2377A	2927J05849	CHAR 1/8/02	1/8/04
	Multimeter	Fluke	FLUKE-77-3	79510405	CHAR 9/26/01	9/26/03
	Peak Power Meter	HP	8900C	2131A00545	CHAR 1/26/01	1/26/03
	Power Meter	HP	432A	1141A07655	CAL 4/15/05	4/15/05

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	DEVICE	MFGR	MODEL	SERNO	CAL/CHAR DATE	DUE DATE or STATUS
	Power Meter And Sensor	Bird	4421-107 4022	0166 0218	CAL 4/16/03	4/16/05
	Power Sensor	HP	478A	72129	CAL 4/15/03	4/15/05
	Digital Thermometer	Fluke	2166A	42032	CAL 1/16/02	1/16/04
	Thermometer	Traulsen	SK-128		CHAR 1/22/02	1/22/04
	Thermometer	Extech	4028	14871-2	CAL 3/7/03	3/7/05
X	Hygro-Thermometer	Extech	445703	0602	CAL 10/4/02	10/4/04
	Frequency Counter	HP	5352B	2632A00165	CAL 11/28/01	11/28/03
	Frequency Counter	HP	5385A	2730A03025	CAL 3/7/03	3/7/05
	Power Sensor	Agilent Technologies	84811A	2551A02705	CHAR 1/26/01	1/26/03
	Service Monitor	IFR	FM/AM 500A	5182	CAL 11/22/00	11/22/02
	Comm. Serv. Monitor	IFR	FM/AM 1200S	6593	CAL 5/12/02	5/12/04
	Signal Generator	HP	8640B	2308A21464	CAL 2/15/02	2/15/04
	Sweep Generator	Wiltron	6648	101009	CAL 4/15/03	4/15/05
	Sweep Generator	Wiltron	6669M	007005	CAL 3/3/03	3/3/05
	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	2/1/03
	BandReject Filter	Lorch Microwave	5BR4-2400/ 60-N	Z1	CHAR 3/2/01	3/2/03
	BandReject Filter	Lorch Microwave	6BR6-2442/ 300-N	Z1	CHAR 3/2/01	3/2/03
	BandReject Filter	Lorch Microwave	5BR4-10525/ 900-S	Z1	CHAR 3/2/01	3/2/03
	High Pass Filter	Microlab	HA-10N		CHAR 10/4/01	10/4/03
	High Pass Filter	Microlab	HA-20N		CHAR 2/7/03	2/7/05

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	DEVICE	MFGR	MODEL	SERNO	CAL/CHAR DATE	DUE DATE or STATUS
	Audio Oscillator	HP	653A	832-00260	CHAR 3/1/01	3/1/03
	Frequency Counter	HP	5382A	1620A03535	CHAR 3/2/01	3/2/03
	Frequency Counter	HP	5385A	3242A07460	CAL 3/7/03	3/7/05
	Preamplifier	HP	8449B-H02	3008A00372	CHAR 3/4/01	3/4/03
	Amplifier	HP	11975A	2738A01969	CHAR 3/1/01	3/1/03
	Egg Timer	Unk			CHAR 8/31/01	8/31/03
	Measuring Tape, 20M	Kraftixx	0631-20		CHAR 2/1/02	2/1/04
	Measuring Tape, 7.5M	Kraftixx	7.5M PROFI		2/1/02	2/1/04
	Coaxial Cable #51	Insulated Wire Inc.	NPS 2251-2880	Timco #51	CHAR 1/23/02	1/23/04
	Coaxial Cable #64	Semflex Inc.	60637	Timco #64	CHAR 1/24/02	1/24/04
	Coaxial Cable #65	General Cable Co.	E9917 RG233/U	Timco #65	CHAR 1/23/02	1/23/04
	Coaxial Cable #106	Unknown	Unknown	Timco #106	CHAR 1/23/02	1/23/04