

APPLICANT: Tactical Electronics Corporation

FCC ID: EF0SX500

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EXHIBITS CONTAINING:

EXHIBIT 1.....	FCC ID LABEL SAMPLE AND SKETCH OF LOCATION
EXHIBIT 2.....	BLOCK DIAGRAM
EXHIBIT 3.....	SCHEMATIC
EXHIBIT 4.....	PARTS LIST
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GENERAL INFORMATION REQUIRED
FOR TYPE ACCEPTANCE

2.1033 Tactical Electronics Corporation will sell the
(c)(1)(2) FCC ID: EFOSX500 VHF transceiver in quantity,
for use under FCC RULES PART 22 & 90.

2.1033 (c) TECHNICAL DESCRIPTION

2.1033 (3) User Manual See Exhibit 14

2.1033 (4) Type of Emission:

11K25F1D for 12.5 kHz

For 12kHz

$B_n = 2M + 2DK$

$M = 9600$ Bits per second

$D = 825$ Hz (Peak Deviation)

$K = 1$

$B_n = 2(9600/2) + 2(825)(1) = 9600 + 1650 = 11.25k$

For 12.5 kHz

ALLOWED AUTHORIZED BANDWIDTH = 11.25 kHz.

11K0F3E for 12.5 kHz

For 12.5 kHz

$B_n = 2M + 2DK$

$M = 3,000$ Hz

$D = 2500$ Hz (Peak Deviation)

$K = 1$

$B_n = 2(3000) + 2(2500)(1) = 6.0k + 5.0k = 11.0k$

For 12.5 kHz

ALLOWED AUTHORIZED BANDWIDTH = 11.25 kHz.

90.209(b)(5)

2.1033 (5) Frequency Range: 421-512 MHz

(6) Power Range and Controls: There are NO user Power controls.

(7) Maximum Output Power Rating:
into a 50 ohm resistive load.

(8) DC Voltages and Current into Final Amplifier:
SEE NEXT PAGE

(9) Tune-up procedure. The tune-up procedure is given
in EXHIBIT 8.

2.1033 (10) Complete Circuit Diagrams: The circuit diagram is
included as EXHIBIT 2. The block diagram is included as
EXHIBIT 3.

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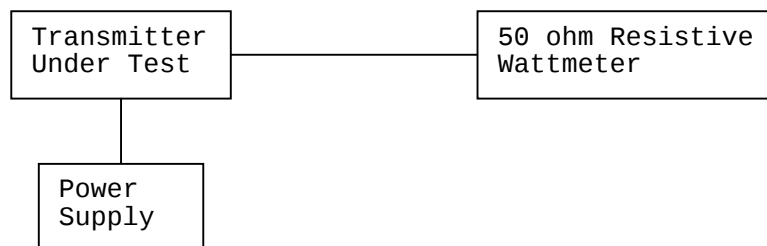
- (11) Function of each electron tube or semiconductor device or other active circuit device:
SEE EXHIBIT 14.
- (8) Instruction book. The instruction manual is included as EXHIBIT 14.
- (10) Description of all circuitry and devices provided for determining and stabilizing frequency is included in the circuit description in the instruction manual.
- 2.1033(c)(11) A photograph or drawing of the equipment identification label is shown in Exhibit 1.
- 2.1033(c)(12) Photographs of the equipment of sufficient clarity to reveal equipment construction and layout and label location are shown in Exhibit 6-7.
- 2.1033(c)(13) For equipment employing digital modulation, a detail description of the modulation technique. This UUT uses FSK to modulate the transmitter.
- 2.1033(c)(14) data required for 2.1046 to 2.1057 See 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 7.2 VDC, and the transmitter properly adjusted the RF output measures:

POWER OUTPUT

INPUT POWER - : $(7.2V)(0.1A) = .72 \text{ Watts}$

OUTPUT POWER: 0.10 Watts Conducted

METHOD OF MEASURING RF POWER OUTPUT



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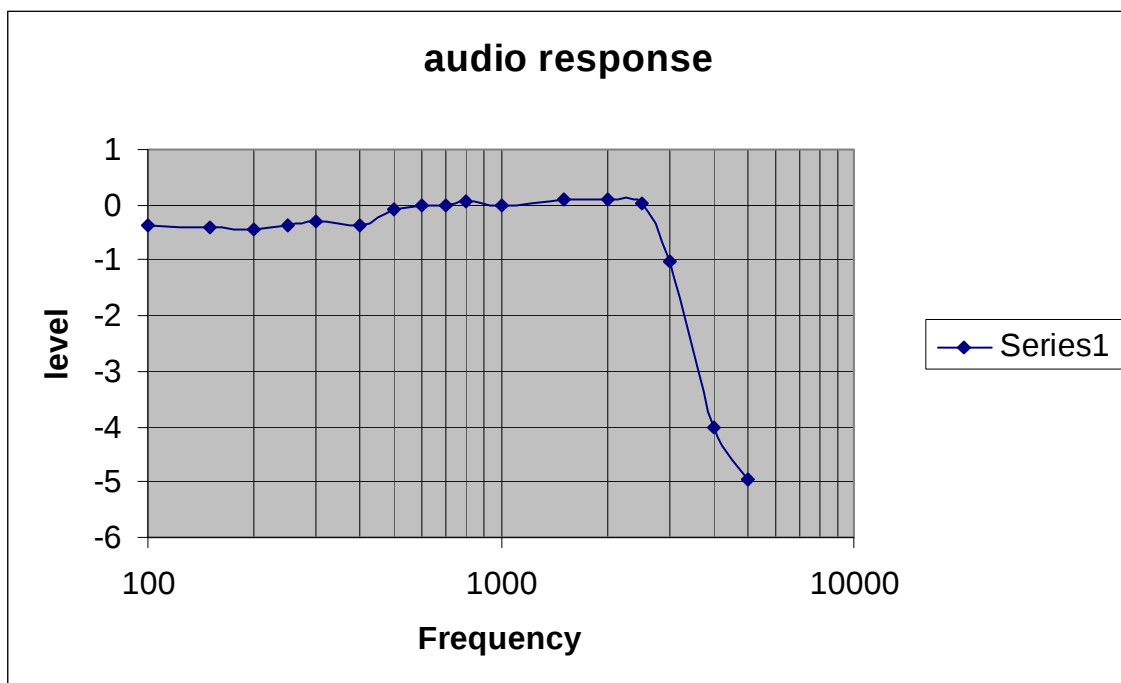
2.1047(a)(b)

Modulation characteristics:

AUDIO FREQUENCY RESPONSE

The audio frequency response was measured in accordance with TIA/EIA Specification 603. The audio frequency response curve is shown on page 5. The audio signal was fed into a dummy microphone circuit and into the microphone connector. The input required to produce 30 percent modulation level was measured.

AUDIO FREQUENCY RESPONSE GRAPH



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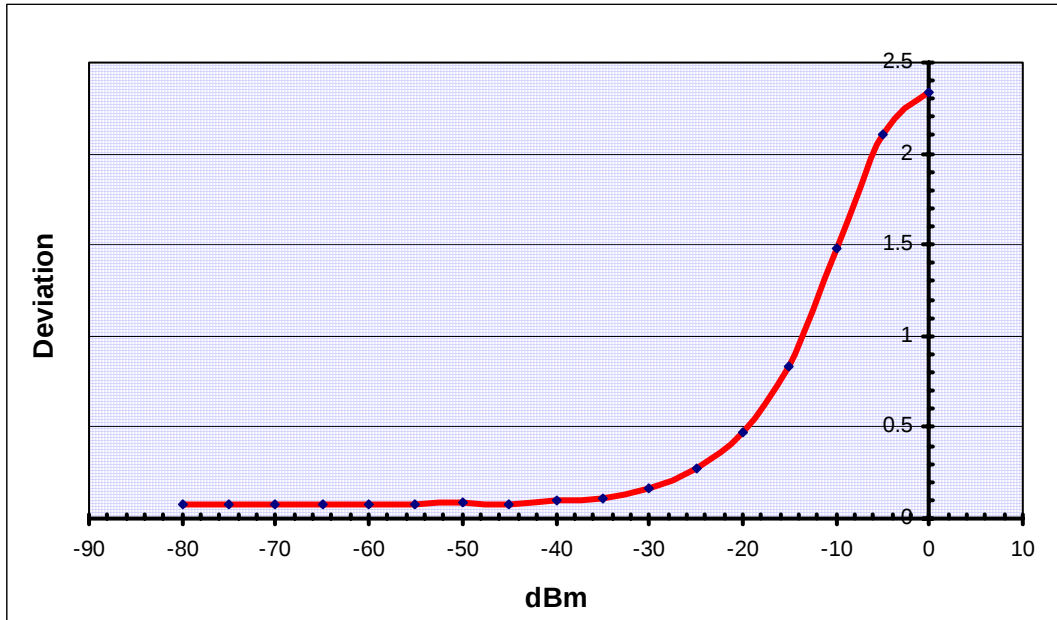
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2.1047(b)

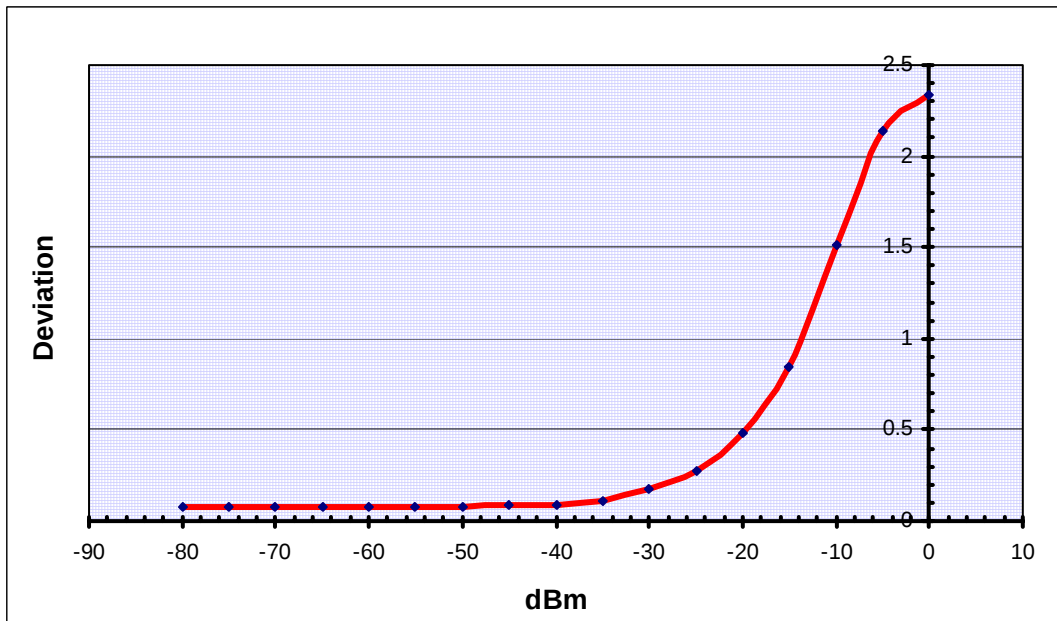
Audio input versus modulation

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 in pages 6-8. Curves are provided for audio input frequencies of 300, 1000, and 2500 Hz.

MODULATION LIMITING PLOT - 300 Hz



MODULATION LIMITING PLOT - 1000 Hz



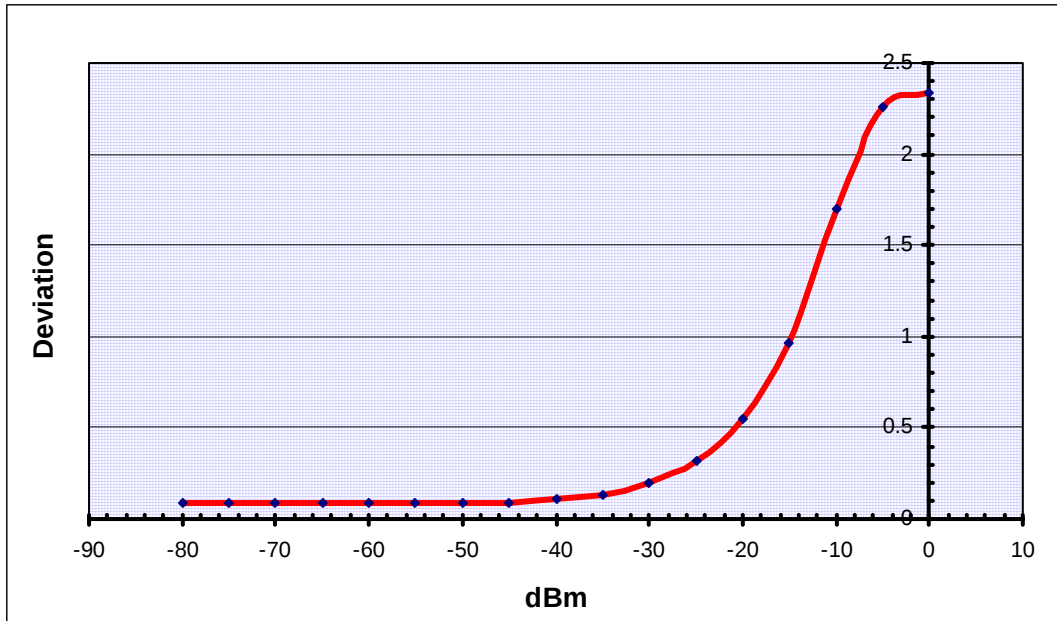
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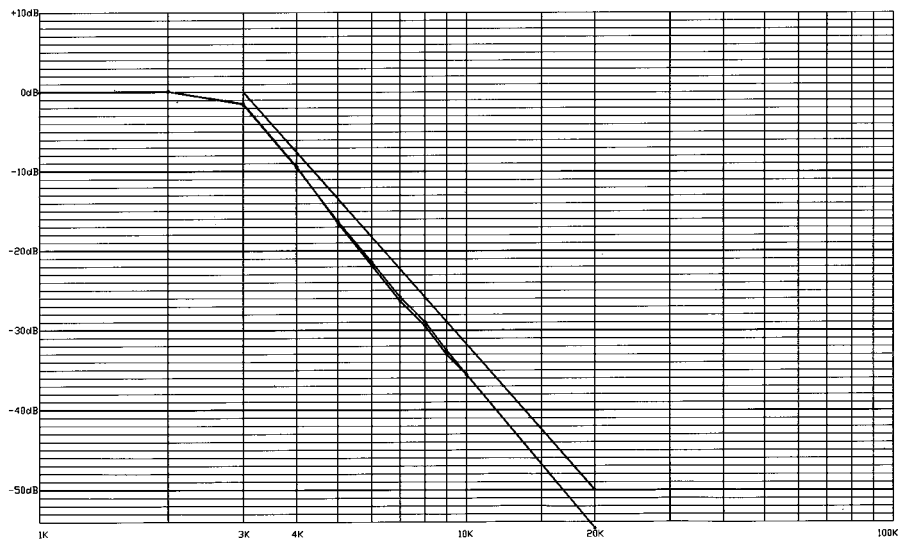
MODULATION LIMITING PLOT - 2500 Hz



Post Limiter Filter The filter must be between the modulation limiter and the modulated stage. At any frequency between 3 & 20 kHz the filter must have an attenuation of $60\log(f/3)$ greater than the attenuation at 1KHz. See the plot; page 9.

2.1049 Audio Low Pass Filter.

Audio Low Pass Filter



2.1049 Occupied bandwidth:

90.210(b,)

For transmitters that are not equipped with an audio low pass filter pursuant to S90.211 (b), the power of any emission must be attenuated below the un-modulated carrier output power as follows; (1) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5 kHz but not more than 10 kHz: At least $83 \log(f_d/5)$ dB; (2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 10 kHz, but not more than 250% of the authorized bandwidth: At least $29 \log(f_d^2/11)$ dB or 50 dB, whichever is the lesser attenuation; (3) On any frequency removed from the center of the authorized bandwidth by more than 250% of the authorized bandwidth: At least $43 + 10 \log(P_o)$ dB.

90.210(d) Emission Mask D - 12.5 kHz channel bandwidth 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 f_0 to 5.625 kHz removed from f_0 : Zero dB.
- (2) On any frequency from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5.625 kHz but no more than 12.5 kHz: At least $7.27 (f_d - 2.88 \text{ kHz})$ dB.
- (3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12.5 kHz: At least $50 + 10 \log(P)$ dB or 70 dB, whichever is the lesser attenuation.

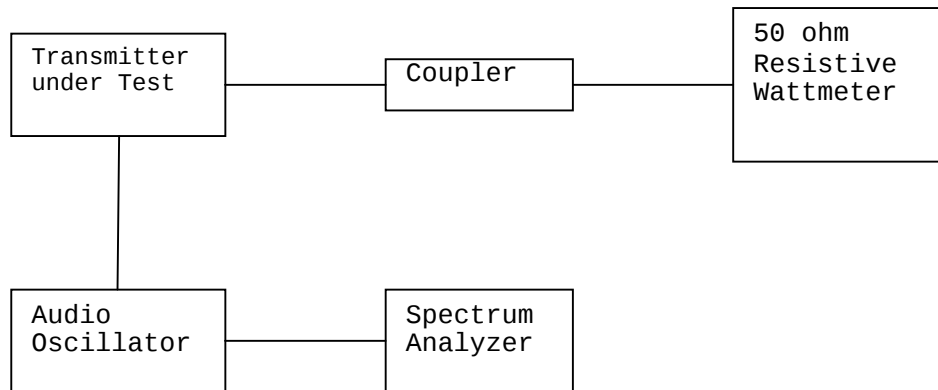
Data in the plots show that on any frequency removed from the assigned frequency by more than 50%, but not more than 100%: At least 25 dB. On any frequency removed from the assigned frequency by more than 100%, but not more than 250%: At least 35 dB. On any frequency removed from the assigned frequency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

Radiotelephone Transmitter with Modulation Limiter

Test procedure: TIA/EIA-603 para 2.2.11 , with the exception that various tones were used.

Test procedure diagram

OCCUPIED BANDWIDTH MEASUREMENT



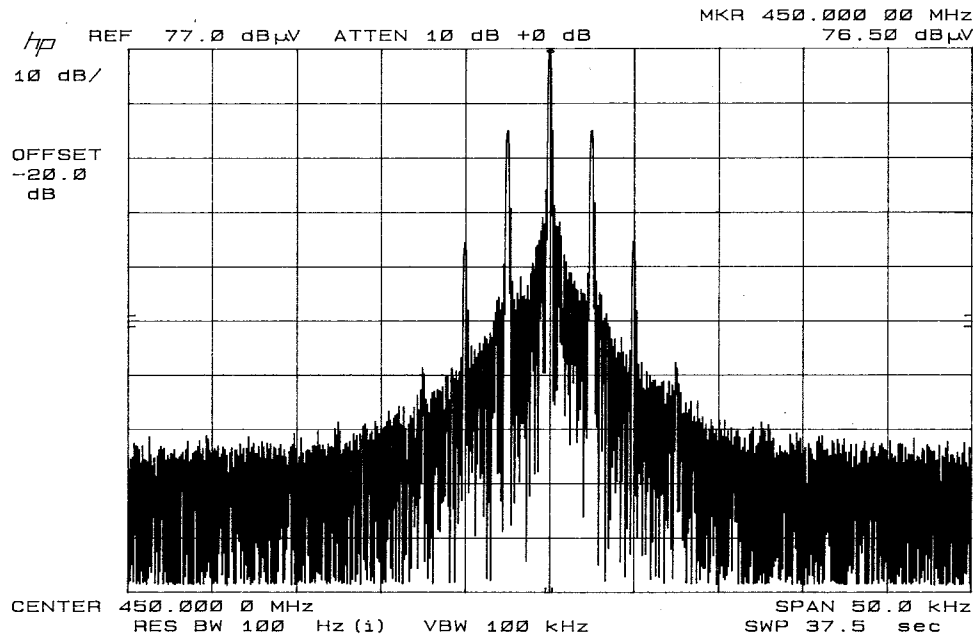
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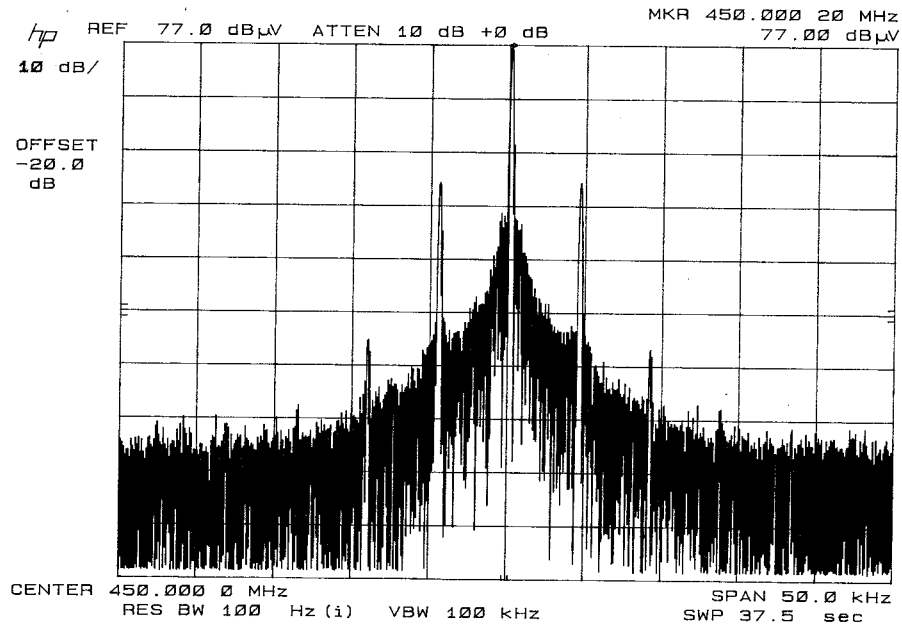
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OCCUPIED BANDWIDTH PLOT - AUDIO INPUT



OCCUPIED BANDWIDTH PLOT - DIGITAL INPUT



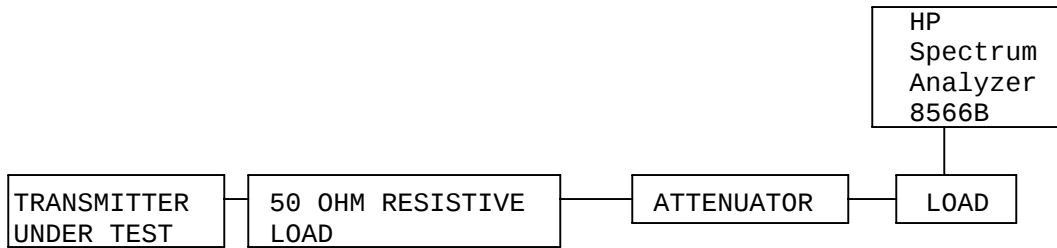
2.1051 Spurious emissions at antenna terminals (conducted):
 2.1052 Data on the following page shows the level of conducted spurious responses. The carrier was modulated 100% using a 2500 Hz tone. The spectrum was scanned from 0.4 to at least the 10th harmonic of the fundamental. The measurements were made in accordance with standard TIA/EIA-603.

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

For 12.5 kHz $50 + 10\log(0.1) = 40.00$ dB

EMISSION FREQUENCY MHz	dB BELOW CARRIER
450	0.0
900	76.4
1350	77.6
1800	81.2
2250	66.1
2700	78.0
3150	57.1
3600	50.9
4050	47.8
4500	68.2
460	0
920	73.5
1380	79.1
1840	73.7
2300	74.5
2760	95.5
3220	72.7
3680	52.7
4140	66
4600	77.6
475	0
950	73.6
1425	77.7
1900	77.0
2375	66.4
2850	70.8
3325	61.9
3800	48.8
4275	69.1
4750	71.6

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 $50 + 10\log(P_o)$ dB below the mean power output of the transmitter.

$$50 + 10\log(0.1) = 40.00 \text{ dB}$$

TEST DATA:

Emission Frequency MHz	ANT. POLARITY	Signal Generator Level (dBm)	Coax Loss (dB)	Substitution Antenna (dBd)	ERP (dBc)
450	H	23.65	0	-0.45	0
900	H	-35.45	0.7	-0.55	58.65
1350	V	-44.25	1	4.85	67.45
1800	H	-45.55	1.1	5.25	68.75
2250	H	-41.05	1.2	6.85	64.25
2700	H	-49.75	1.3	7.05	72.95
3150	V	-39.20	1.35	7.15	62.4
3600	V	-36.05	1.4	7.55	59.25
4050	V	-29.00	1.45	7.55	52.2
4500	V	-40.95	1.5	8.35	64.15

Emission Frequency MHz	ANT. POLARITY	Signal Generator Level (dBm)	Coax Loss (dB)	Substitution Antenna (dBd)	ERP (dBc)
460	H	23.45	0	-0.45	0
920	H	-36.75	0.7	-0.85	59.75
1380	H	-45.35	1.1	4.85	68.35
1840	V	-32.75	1.2	5.25	55.75
2300	H	-49.9	1.25	6.85	72.9
2760	V	-62.3	1.35	7.05	85.3
3220	V	-41.6	1.35	7.45	64.6
3680	V	-38.05	1.4	7.55	61.05
4140	H	-43.6	1.45	7.55	66.6
4600	V	-47.15	1.5	8.25	70.15

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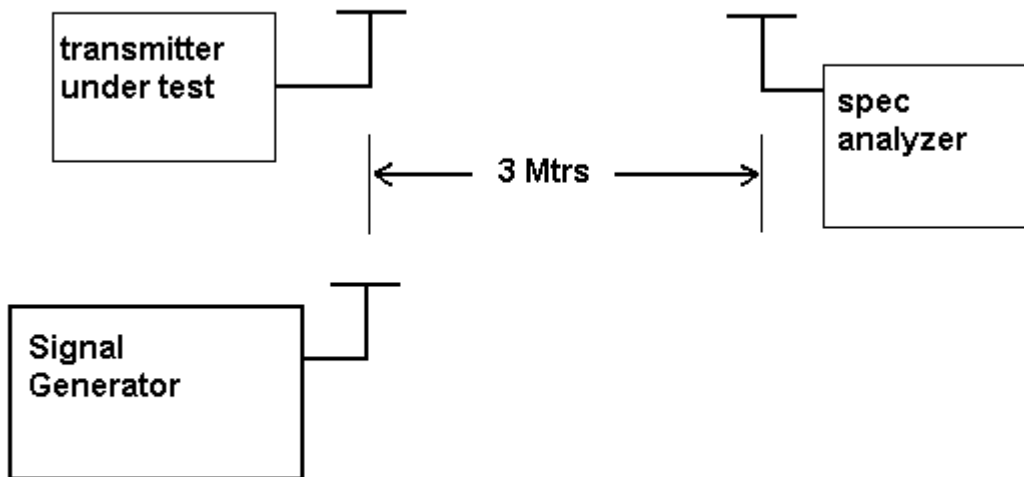
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Emission Frequency MHz	ANT. POLARITY	Signal Generator Level (dBm)	Coax Loss (dB)	Substitution Antenna (dBd)	ERP (dBc)
475	H	23.95	0	-0.55	0
950	H	-25.25	0.7	-1.15	48.65
1425	H	-42.45	1.1	4.95	65.85
1900	H	-41.15	1.2	5.25	64.55
2375	H	-34.4	1.25	6.85	57.8
2850	H	-49.4	1.35	7.15	72.8
3325	V	-33.55	1.4	7.55	556.95
3800	V	-35.7	1.45	7.55	59.1
4275	V	-36	1.45	8.05	59.4
4750	V	-50.55	1.5	7.85	73.95

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.

Method of Measuring Radiated Spurious Emissions



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2.1055 Frequency stability:

90.213(a)(1)

Temperature and voltage tests were performed to verify that the frequency remains within the .00015%, 1.5 ppm specification limit, for 25 kHz spacing & 0.00025% for 12.5 kHz spacing. The test was conducted as follows: The transmitter was placed in the temperature chamber at 25°C and allowed to stabilize for one hour. The transmitter was keyed ON for one minute during which four frequency readings were recorded at 15 second intervals. The worse case number was taken for temperature plotting. The assigned channel frequency was considered to be the reference frequency. The temperature was then reduced to -30°C after which the transmitter was again allowed to stabilize for one hour. The transmitter was keyed ON for one minute, and again frequency readings were noted at 15 second intervals. The worst-case number was recorded for temperature plotting. This procedure was repeated in 10° increments up to + 50 degrees C. Readings were also taken at minus 15% of the battery voltage of 7.2VDC, which we estimate to be the battery endpoint.

MEASUREMENT DATA:

Assigned Frequency (Ref. Frequency): 460.000 000 MHz

TEMPERATURE_°C	FREQUENCY_MHz	PPM
REFERENCE_____	460.000 000	00.0
-30_____	460.000 363	0.79
-20_____	460.000 374	0.81
-10_____	460.000 477	1.04
0_____	460.000 562	1.22
+10_____	460.000 510	1.11
+20_____	460.0 002	0.43
+30_____	459.999 822	-0.39
+40_____	459.999 633	-0.80
+50_____	459.999 429	-1.24

-15% Battery End-Point VDC 460.000 186 0.40

RESULTS OF MEASUREMENTS: The maximum frequency variation over the temperature range was +1.22 ppm.

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2.1055(a)(1) Frequency stability:
90.214 Transient Frequency Behavior

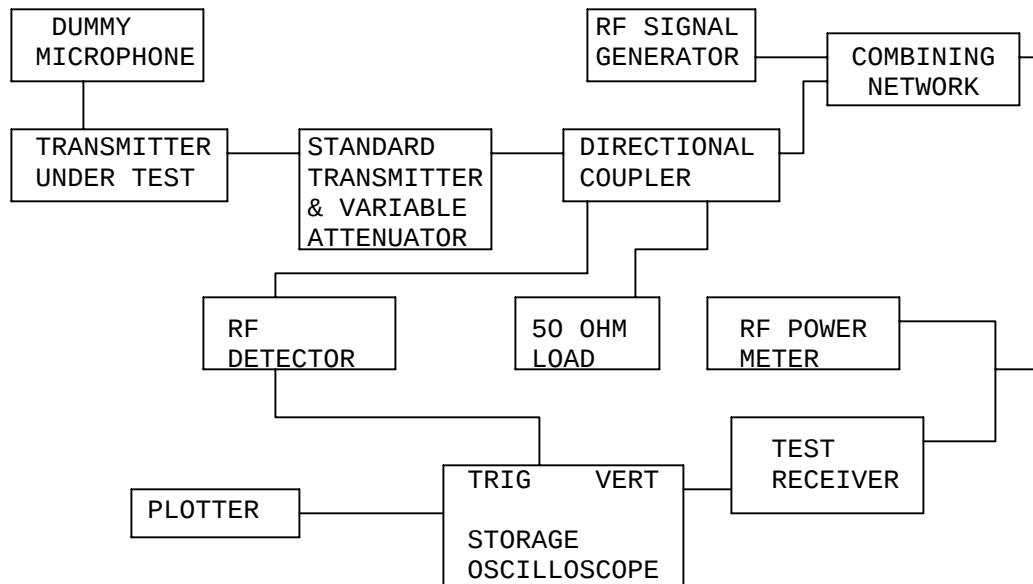
REQUIREMENTS: In the 450-500MHz frequency band, transient frequencies must be within the maximum frequency difference limits during the time interval indicated below for 12.5kHz Channels:

Time Interval	Maximum Frequency	Portable Radios 450-500 MHz
t1	+12.5 kHz	10.0 ms
t2	+6.25 kHz	25.0 ms
t3,t4	+12.5 kHz	10.0 ms

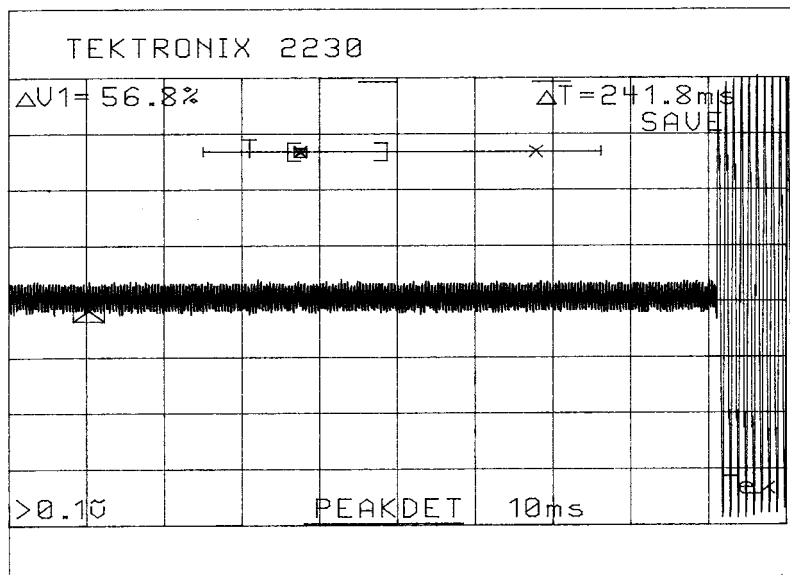
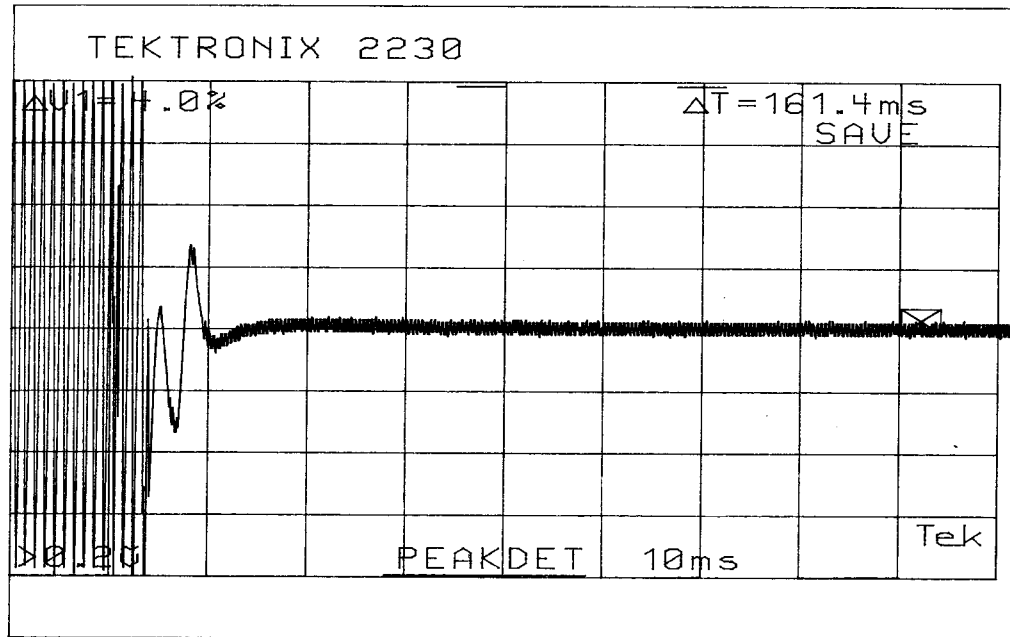
TEST PROCEEDURE: TIA/EIA TS603 PARA 2.2.19, the levels were set as follows;

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.

2.1055 Frequency stability:
90.214 Transient Frequency Behavior
(Continued)



TRANSIENT FREQUENCY BEHAVIOR
12.5 KHz



MPE CALCULATION

Where:

Power = 100 mWatts

Frequency is 480 MHz

Time averaging is : 50% Transmit on time is 15 minutes in 30 minute period.

Uncontrolled exposure

Conclusions: For a 20 cm separation distance an antenna with 13 dBd of gain can be used.

$W := 0.1$ power in Watts $D := 1$ Duty Factor in decimal % (1=100%)

$E := 15.0$ exposure time in minutes $U := 30$ (use 6 for controlled and 30 for uncontrolled)

$$W_{exp} := W \cdot D \cdot \left(\frac{E}{U} \right)$$

$$PC := \frac{E}{U}$$

$PC = 0.5$ percent on time

$W_{exp} = 0.05$ Watts

$P_o := 50$ mWatts $dBd := 13$ antenna gain $f := 480$ Frequency in MHz

$G := dBd + 2.15$ gain in dBi

$G_n := 10^{\frac{G}{10}}$ gain numeric

$$S := \frac{f}{1500}$$

controlled exposure

300 for controlled

1500 for uncontrolled

$G_n = 32.734$

$S = 0.32$

$$R := \sqrt{\frac{(P_o \cdot G_n)}{(4 \cdot \pi \cdot S)}}$$

$$R_{inches} := \frac{R}{2.54}$$

$R = 20.175$ distance in centimeters
required for compliance

$R_{inches} = 7.943$

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EMC Equipment List

Last Update: 6/27/03

	DEVICE	MFGR	MODEL	SERNO	CAL/CHAR DATE	DUE DATE or STATUS
	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
X	Receiver, Beige Tower Spectrum Analyzer	HP	8566B Opt 462	3138A07786 3144A20661	CAL 8/31/01	8/31/03
X	RF Preselector	HP	85685A	3221A01400	CAL 8/31/01	8/31/03
X	Quasi-Peak Adapter	HP	85650A	3303A01690	CAL 8/31/01	8/31/03
X	Preamplifier	HP	8449B-H02	3008A00372	CHAR 3/4/01	3/4/03
	Receiver, Blue Tower Spectrum Analyzer	HP	8568B	2928A04729 2848A18049	CAL 4/15/03	4/15/05
	RF Preselector	HP	85685A	2926A00983	CAL 4/15/03	4/15/05
	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
	Biconnical Antenna	Electro-Metrics	BIA-25	1171	CAL 4/26/01	4/26/03
X	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
	Log-Periodic Antenna	Eaton	96005	1243	CAL 5/8/03	5/8/05
	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
X	Horn Antenna *(at 3 meters)	Electro-Metrics	EM-6961	6246	CAL 3/31/03	3/31/05
	Horn Antenna *(at 10 meters)	Electro-Metrics	EM-6961	6246	CAL 6/4/03	6/4/05
	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
	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
	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
X	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
X	Temperature Chamber	Tenney Engineering	TTRC	11717-7	CHAR 1/22/02	1/22/04
X	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

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	DEVICE	MFGR	MODEL	SERNO	CAL/CHAR DATE	DUE DATE or STATUS
	Multimeter	Fluke	FLUKE-77-3	79510405	CHAR 9/26/01	9/26/03
X	Peak Power Meter	HP	8900C	2131A00545	CHAR 1/26/01	1/26/03
	Power Meter	HP	432A	1141A07655	CAL 4/15/03	4/15/05
	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
X	Thermometer	Extech	4028	14871-2	CAL 3/7/03	3/7/05
	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
X	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
X	Comm. Serv. Monitor	IFR	FM/AM 1200S	6593	CAL 5/12/02	5/12/04
X	Signal Generator	HP	8640B	2308A21464	CAL 2/15/02	2/15/04
X	Sweep Generator	Wiltron	6648	101009	CAL 4/15/03	4/15/05
	Sweep Generator	Wiltron	6669M	007005	CAL 3/3/03	3/3/05
X	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

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	DEVICE	MFGR	MODEL	SERNO	CAL/CHAR DATE	DUE DATE or STATUS
	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 12/17/02	12/17/04
	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
	Audio Oscillator	HP	653A	832-00260	CHAR 3/1/01	3/1/03
X	Audio Generator	B&K Precision	3010	8739686	CHAR 12/1/02	12/1/04
	Frequency Counter	HP	5382A	1620A03535	CHAR 3/2/01	3/2/03
	Frequency Counter	HP	5385A	3242A07460	CAL 3/7/03	3/7/05
	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
X	Measuring Tape, 7.5M	Kraftixx	7.5M PROFI		2/1/02	2/1/04
X	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
X	Coaxial Cable #106	Unknown	Unknown	Timco #106	CHAR 1/23/02	1/23/04

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