

TIMCOENGINEERING INC.

849 NW State Road 45

Newberry, Florida 32669

<http://www.timcoengr.com>

888.472.2424 F 352.472.2030 email: sid@timcoengr.com



Test Report

Product Name: MODEL T-35 AUDITORY ASSISTANCE TRANSMITTER

FCC ID: CNMT35

Applicant:

**WILLIAMS SOUND CORPORATION
10399 W. 70th Street
Eden Prairie, MN 55344**

Date Receipt: OCTOBER 24, 2002

Date Tested: NOVEMBER 8, 2002

APPLICANT: WILLIAMS SOUND CORPORATION
FCC ID: CNMT35
REPORT #: W\WSC\1085TU2\1085TU2TestReport.doc

COVER SHEET

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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 12/22/99	12/22/02
	3/10-Meter OATS	TEI	N/A	N/A	Listed 3/26/01	3/26/04
	Receiver, Beige Tower Spectrum Analyzer (Tan)	HP	8566B Opt 462	3138A07786 3144A20661	CAL 8/31/01	8/31/03
	RF Preselector (Tan)	HP	85685A	3221A01400	CAL 8/31/01	8/31/03
	Quasi-Peak Adapter (Tan)	HP	85650A	3303A01690	CAL 8/31/01	8/31/03
X	Receiver, Blue Tower Spectrum Analyzer (Blue)	HP	8568B	2928A04729 2848A18049	CHAR 10/22/01	10/22/03
X	RF Preselector (Blue)	HP	85685A	2926A00983	CHAR 10/22/01	10/22/03
X	Quasi-Peak Adapter (Blue)	HP	85650A	2811A01279	CHAR 10/22/01	10/22/03
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	CHAR 3/15/00	3/15/02
	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	CHAR 10/16/01	10/16/03
	Dipole Antenna Kit	Electro-Metrics	TDA-30/1-4	152	CAL 3/21/01	3/21/04

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	Dipole Antenna Kit	Electro-Metrics	TDA-30/1-4	153	CHAR 11/24/00	11/24/03
	Double-Ridged Horn Antenna	Electro-Metrics	RGA-180	2319	CAL 12/19/01	12/19/03
	Horn Antenna	Electro-Metrics	EM-6961	6246	CAL 3/21/01	3/21/03
	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 3/16/01	3/16/03
	Termaline Wattmeter	Bird Electronic Corporation	611	16405	CAL 5/25/99	5/25/01
	Termaline Wattmeter	Bird Electronic Corporation	6104	1926	CAL 12/12/01	12/12/03
	Oscilloscope	Tektronix	2230	300572	CHAR 2/1/01	2/1/03
	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	CAL 9/26/01	9/26/03

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	Peak Power Meter	HP	8900C	2131A00545	CHAR 1/26/01	1/26/03
	Digital Thermometer	Fluke	2166A	42032	CAL 1/16/02	1/16/04
	Thermometer	Traulsen	SK-128		CHAR 1/22/02	1/22/04
X	Temp/Humidity gauge	EXTech	44577F	E000901	CHAR 1/22/02	1/22/04
	Frequency Counter	HP	5352B	2632A00165	CAL 11/28/01	11/28/03
	Power Sensor	Agilent Technologies	84811A	2551A02705	CAL 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 11/15/01	11/15/03
	Modulation Analyzer	HP	8901A	3435A06868	CAL 9/5/01	9/5/03
	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 Pas Filter	Microlab	HA-10N		CHAR 10/4/01	10/4/03
	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	CHAR 12/11/01	12/11/03

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	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

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TEST PROCEDURES

GENERAL: This report shall NOT be reproduced except in full without the written approval of TIMCO ENGINEERING, INC.

RADIATION INTERFERENCE: The test procedure used was ANSI STANDARD C63.4-1992 using a HEWLETT PACKARD spectrum analyzer with a preselector. In the frequency range 10 kHz to 30 MHz the RBW was 10 kHz and from 30-1000 MHz the RBW of the spectrum analyzer was 100 kHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was 100 kHz and the video bandwidth was 300 kHz. The ambient temperature of the UUT was &temp& with a humidity of &humr&.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the Preselector was accounted for in the Spectrum Analyzer Meter Reading.

Example:

Freq (MHz)	METER READING + ACF = FS
33	20 dBuV + 10.36 dB = 30.36 dBuV/m @ 3m

ANSI C63.4-1992 Section 8.2.1 MEASUREMENT PROCEDURES: The EUT was placed on a non-conducting table 80 cm above the ground plane with the EUT located in the center of the table. With the antenna vertical a preliminary scan was done at 1 meters distance, the EUT was moved to a 3.0-meter distance and the antenna height varied and also placed in a horizontal position. The frequency was scanned from 9.0 kHz to 1.0 GHz. When an emission was found, the table was rotated to produce the maximum signal strength. The EUT was measured in three (3) orthogonal planes. The unit was measured at TIMCO ENGINEERING, INC. located at 849 N.W. State Road 45 Newberry, Florida 32669.

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2.1033(c) (4) Type of Emission - NARROW BAND: 23K4F3E

$$B_n = 2M + 2DK$$

$$M = 6000$$

$$D = 5700$$

$$B_n = 2(6000) + 2(5700) = 23.4 \text{ kHz}$$

2.1033(c) (4) Type of Emission - WIDE BAND: 144K0F3E

$$B_n = 2M + 2DK$$

$$M = 15000$$

$$D = 57000$$

$$B_n = 2(15000) + 2(57000) = 144 \text{ kHz}$$

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.

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, 2500, and 15000 Hz.

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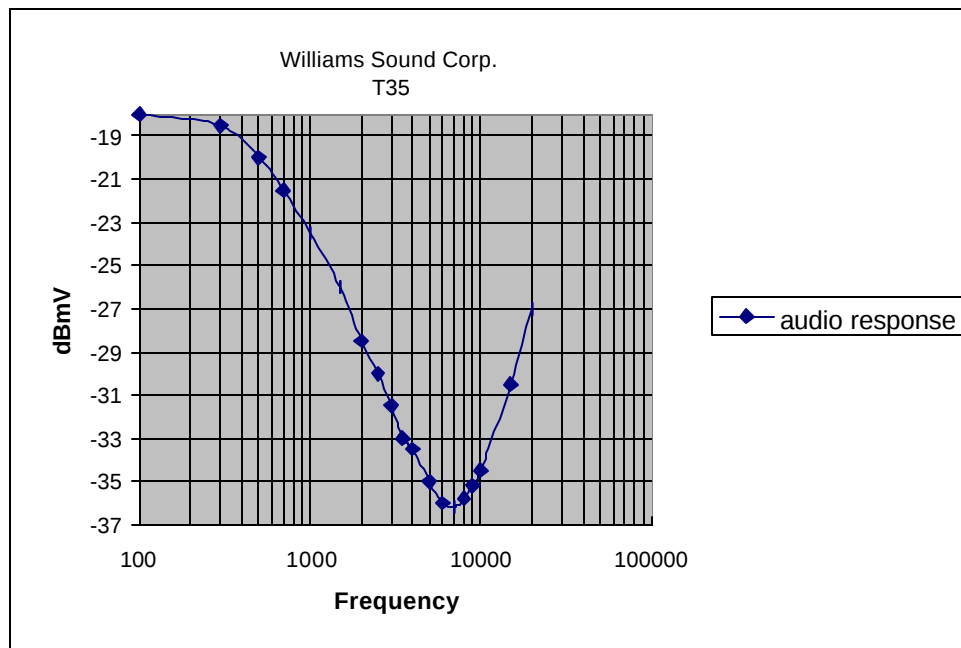
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AUDIO FREQUENCY RESPONSE PLOT - NARROW BAND



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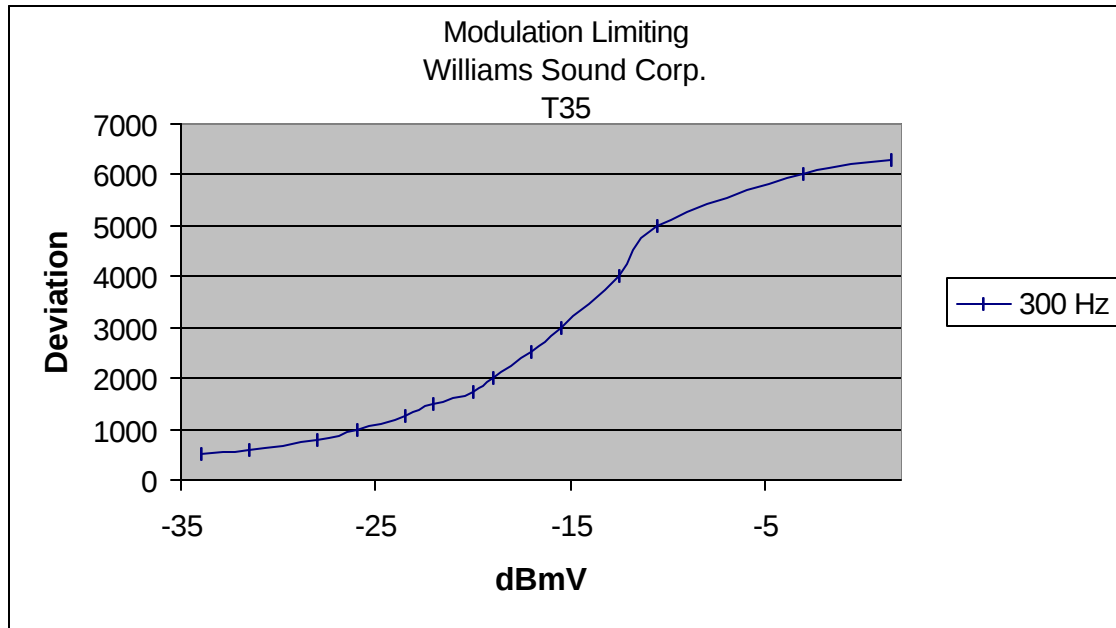
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MODULATION LIMITING 300 Hz - NARROW BAND



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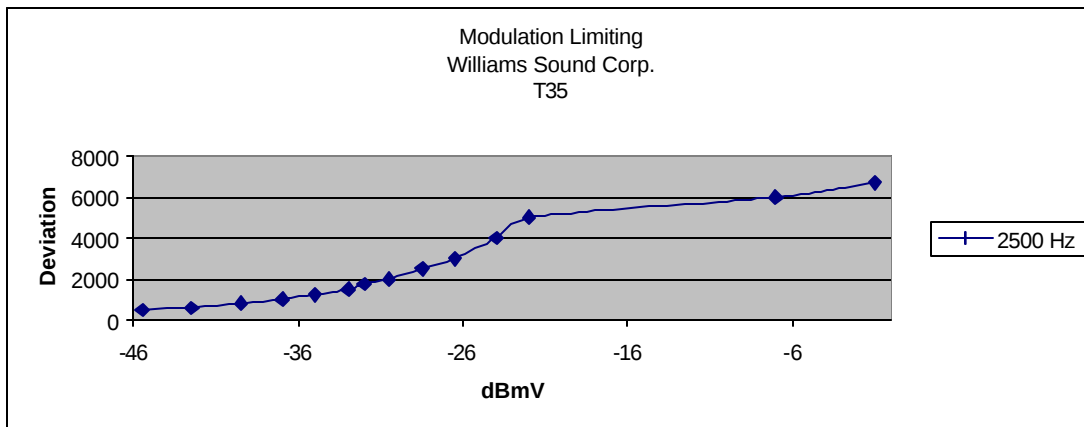
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MODULATION LIMITING 2500 Hz - NARROW BAND



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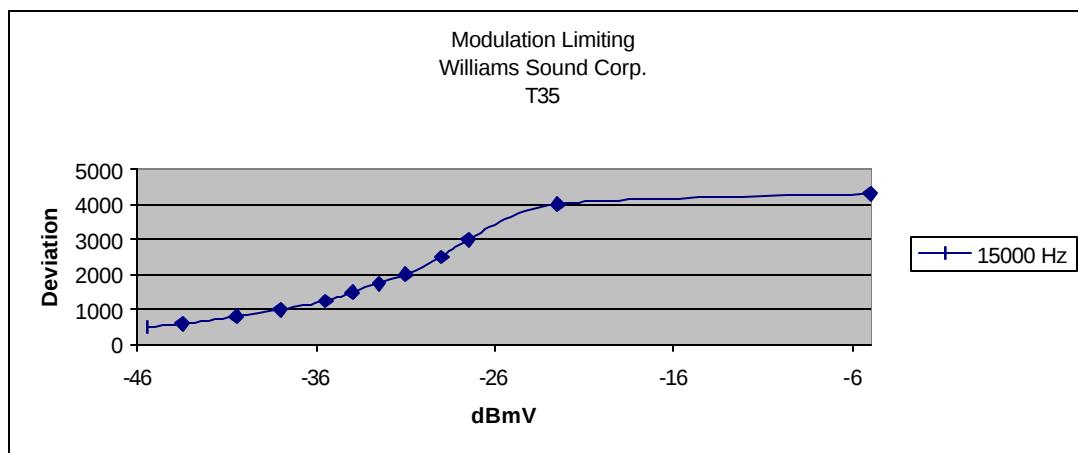
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MODULATION LIMITING 15000 Hz - NARROW BAND



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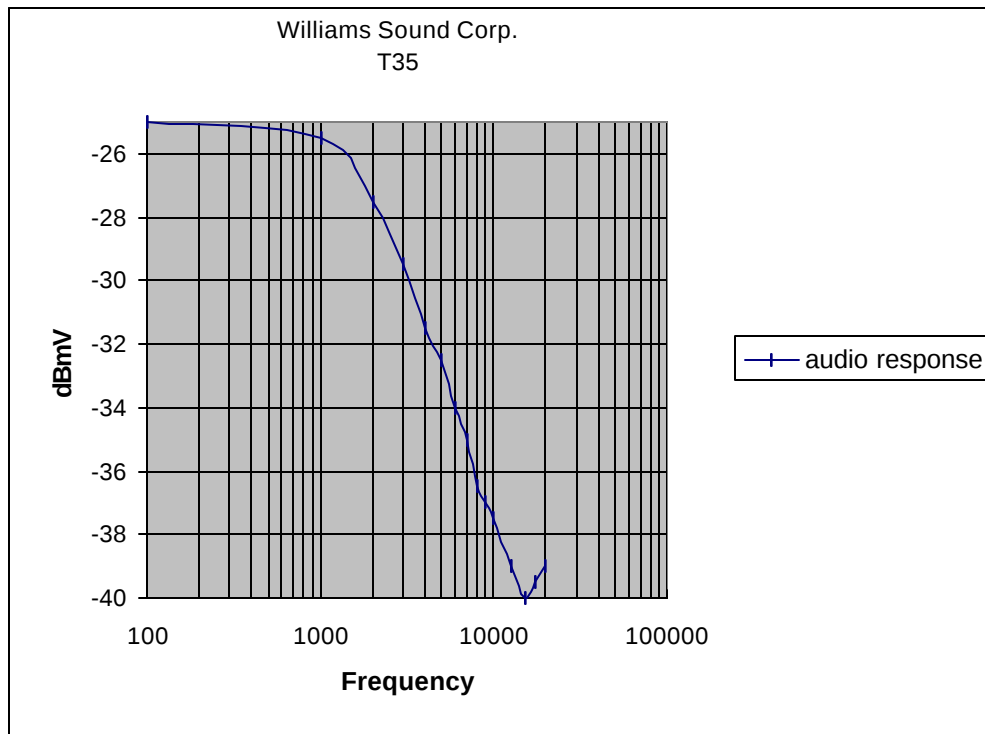
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AUDIO FREQUENCY RESPONSE PLOT - WIDE BAND



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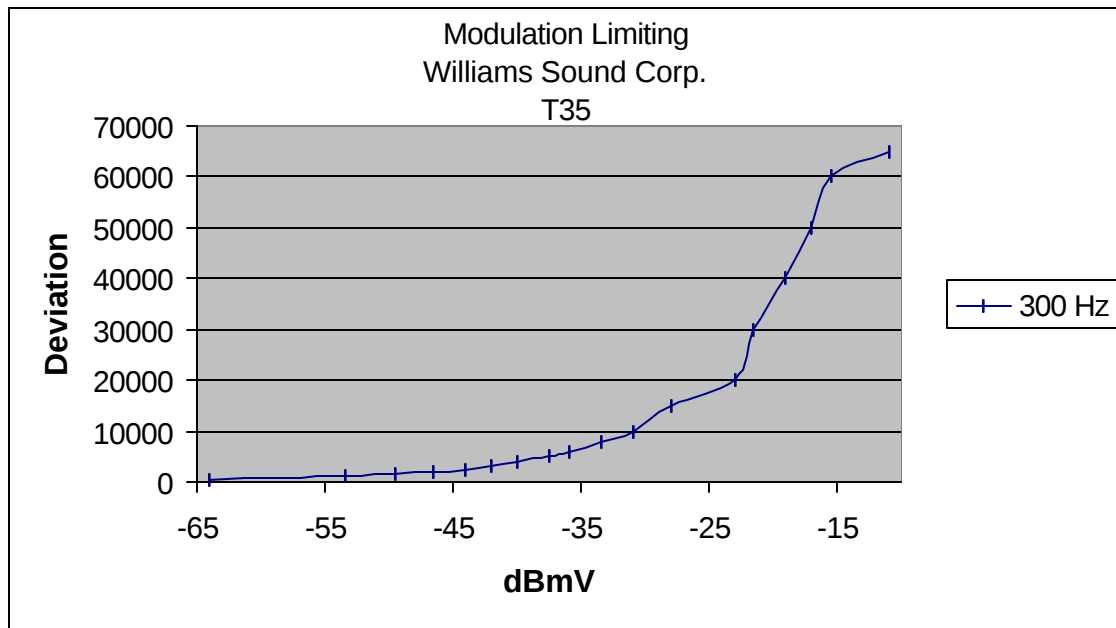
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MODULATION LIMITING 300 Hz - WIDE BAND



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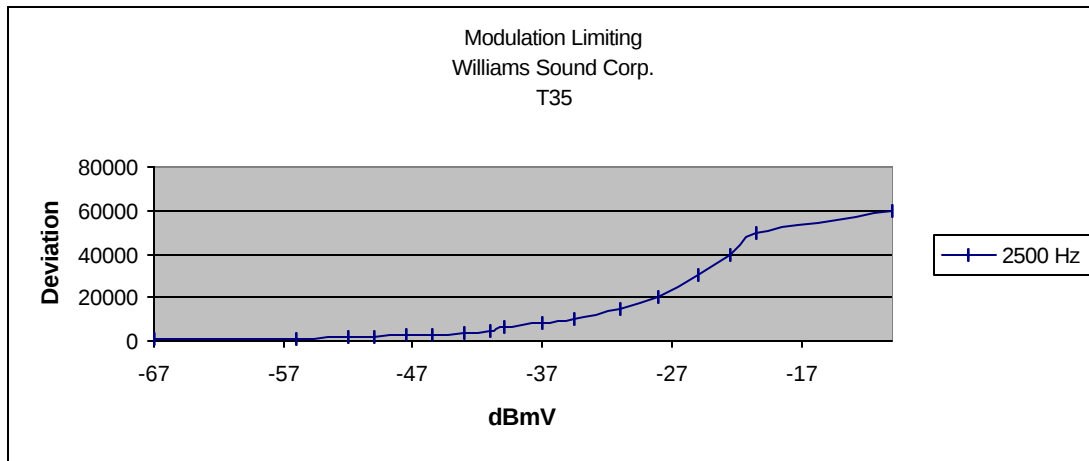
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MODULATION LIMITING 2500 Hz - WIDE BAND



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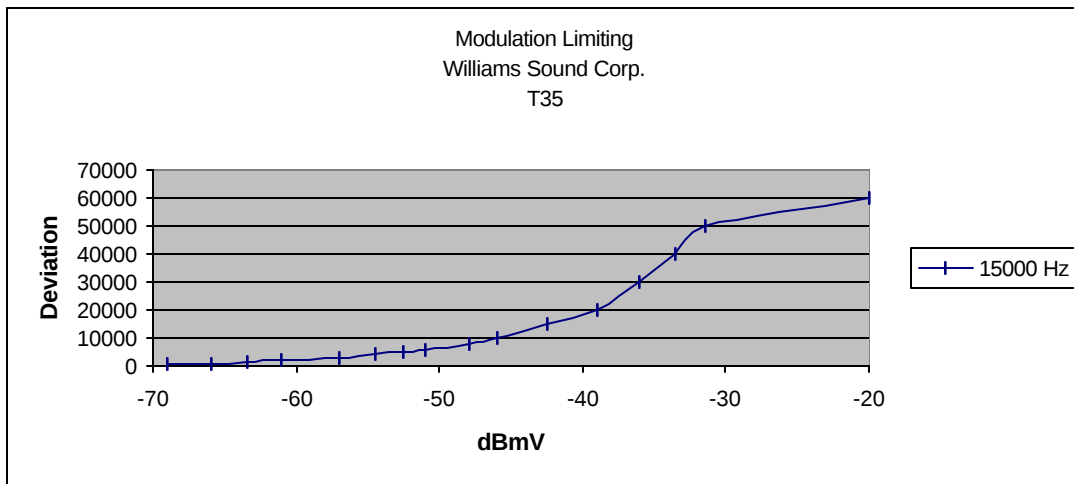
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MODULATION LIMITING 15000 Hz - WIDE BAND



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NAME OF TEST: RADIATION INTERFERENCE

RULES PART NO. 15.109(a) and 15.209

REQUIREMENTS: CARRIER FREQUENCY WILL NOT EXCEED 80 MILLIVOLTS PER
METER @ 3M OR 98 dBuV/m

OUT-OF-BAND EMISSIONS SHALL NOT EXCEED 1500 uV/m @ 3M OR
63.5 dBuV.

THE EMISSION LIMITS ARE BASED ON INSTRUMENTATION EMPLOYING
AN AVERAGE DETECTOR. EMISSIONS IN THE RESTRICTED BANDS
SHALL NOT EXCEED 54 dBuV/m.

TEST DATA:

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity	Coax Loss dB	Correction Factor dB	Field Strength dBuV/m	Margin dB
TELESCOPIC							
WHIP							
72.0	72.00	74.9	H	1.01	6.22	82.13	15.87
72.0	72.00	82.3	V	1.01	6.22	89.53	8.47
72.0	144.00	26.3	V	1.38	15.86	43.54	19.96
72.0	144.00	18.0	H	1.38	15.86	35.24	28.26
72.0	216.00	28.4	V	1.86	11.42	41.68	21.82
72.0	216.00	24.7	H	1.86	11.42	37.98	25.52
72.0	288.10	12.5	V	2.15	15.35	30.00	33.50
72.0	360.10	11.9	V	2.56	14.90	29.36	34.14
72.0	432.10	15.0	V	2.90	17.22	35.12	28.38
HIGH POWER							
72.1	72.10	87.5	H	1.01	6.25	94.76	3.24
72.1	72.10	90.0	V	1.01	6.25	97.26	0.74
72.1	144.00	41.3	V	1.38	15.86	58.54	4.96
72.1	144.00	32.3	H	1.38	15.86	49.54	13.96
72.1	216.00	39.3	V	1.86	11.42	52.58	10.92
72.1	216.00	33.5	H	1.86	11.42	46.78	16.72
72.1	288.10	10.0	H	2.15	15.35	27.50	36.00
72.1	288.10	11.2	V	2.15	15.35	28.70	34.80
72.1	360.10	13.0	H	2.56	14.90	30.46	33.04
72.1	360.10	25.7	V	2.56	14.90	43.16	20.34
72.1	432.10	14.8	V	2.90	17.22	34.92	28.58
72.1	432.10	10.8	H	2.90	17.22	30.92	32.58

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Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuv	Ant. Polarity	Coax Loss dB	Correction Factor dB	Field Strength dBuv/m	Margin dB
MEDIUM POWER							
72.2	72.20	88.3	V	1.01	6.27	95.58	2.42
72.2	72.20	81.4	H	1.01	6.27	88.68	9.32
72.2	144.00	34.7	V	1.38	15.86	51.94	11.56
72.2	144.00	25.8	H	1.38	15.86	43.04	20.46
72.2	216.00	33.5	V	1.86	11.42	46.78	16.72
72.2	216.00	29.6	H	1.86	11.42	42.88	20.62
72.2	288.10	11.3	V	2.15	15.35	28.80	34.70
72.2	360.10	15.3	V	2.56	14.90	32.76	30.74
72.2	432.10	15.5	V	2.90	17.22	35.62	27.88
COAX ANTENNA HIGH POWER							
72.3	72.30	90.2	H	1.01	6.30	97.51	0.49
72.3	72.30	88.6	V	1.01	6.30	95.91	2.09
72.3	144.00	39.8	V	1.38	15.86	57.04	6.46
72.3	144.00	46.2	H	1.38	15.86	63.44	0.06
72.3	216.10	29.2	V	1.86	11.42	42.48	21.02
72.3	216.10	34.5	H	1.86	11.42	47.78	15.72
72.3	288.10	13.2	H	2.15	15.35	30.70	32.80
72.3	360.10	22.5	H	2.56	14.90	39.96	23.54
72.3	360.10	14.7	V	2.56	14.90	32.16	31.34
72.3	432.10	9.7	H	2.90	17.22	29.82	33.68
MEDIUM POWER							
72.4	72.40	82.2	V	1.01	6.32	89.53	8.47
72.4	72.40	87.0	H	1.01	6.32	94.33	3.67
72.4	144.00	35.2	V	1.38	15.86	52.44	11.06
72.4	144.00	44.2	H	1.38	15.86	61.44	2.06
72.4	216.10	22.7	V	1.86	11.42	35.98	27.52
72.4	216.10	28.1	H	1.86	11.42	41.38	22.12
72.4	288.10	11.5	H	2.15	15.35	29.00	34.50
72.4	360.10	14.9	H	2.56	14.90	32.36	31.14
72.4	432.10	11.0	H	2.90	17.22	31.12	32.38
LOW POWER							
72.5	72.50	75.8	V	1.01	6.35	83.16	14.84
72.5	72.50	80.6	H	1.01	6.35	87.96	10.04
72.5	144.00	27.6	V	1.38	15.86	44.84	18.66
72.5	144.00	37.1	H	1.38	15.86	54.34	9.16
72.5	216.10	22.7	H	1.86	11.42	35.98	27.52
72.5	216.10	17.8	V	1.86	11.42	31.08	32.42

APPLICANT: WILLIAMS SOUND CORPORATION

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TIMCO ENGINEERING INC.

849 NW State Road 45

Newberry, Florida 32669

<http://www.timcoengr.com>

888.472.2424 F 352.472.2030 email: sid@timcoengr.com

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuv	Ant. Polarity	Coax Loss dB	Correction Factor dB	Field Strength dBuv/m	Margin dB
RUBBER DUCK HIGH POWER							
72.6	72.60	90.3	V	1.01	6.38	97.69	0.31
72.6	72.60	85.8	H	1.01	6.38	93.19	4.81
72.6	144.00	18.7	V	1.38	15.86	35.94	27.56
72.6	144.00	13.9	H	1.38	15.86	31.14	32.36
72.6	216.00	12.9	H	1.86	11.42	26.18	37.32
72.6	216.00	13.0	V	1.86	11.42	26.28	37.22
MEDIUM POWER							
72.7	72.70	84.7	V	1.01	6.40	92.11	5.89
72.7	72.70	79.6	H	1.01	6.40	87.01	10.99
72.7	144.00	10.8	H	1.38	15.86	28.04	35.46
72.7	144.00	14.5	V	1.38	15.86	31.74	31.76
72.7	216.00	11.6	V	1.86	11.42	24.88	38.62
72.7	216.00	9.4	H	1.86	11.42	22.68	40.82
LOW POWER							
72.8	72.80	78.4	V	1.01	6.43	85.84	12.16
72.8	72.80	83.5	H	1.01	6.43	90.94	7.06
72.8	144.00	11.0	V	1.38	15.86	28.24	35.26
72.8	216.00	10.0	V	1.86	11.42	23.28	40.78
DIPOLE HIGH POWER							
72.9	72.90	87.4	V	1.01	6.45	94.86	3.14
72.9	72.90	88.5	H	1.01	6.45	95.96	2.04
72.9	144.00	30.4	V	1.38	15.86	47.64	15.86
72.9	144.00	39.1	H	1.38	15.86	56.34	7.16
72.9	216.10	31.1	V	1.86	11.42	44.38	19.12
72.9	216.10	37.3	H	1.86	11.42	50.58	12.92
72.9	288.10	10.8	H	2.15	15.35	28.30	35.20
72.9	360.10	12.4	V	2.56	14.90	29.86	33.64
72.9	360.10	15.3	H	2.56	14.90	32.76	30.74
72.9	432.10	10.8	H	2.90	17.22	30.92	32.58
MEDIUM POWER							
72.1	72.11	81.0	V	1.01	6.25	88.26	9.74
72.1	72.11	82.7	H	1.01	6.25	89.96	8.04
72.1	144.00	24.3	V	1.38	15.86	41.54	21.96
72.1	144.00	33.1	H	1.38	15.86	50.34	13.16
72.1	216.10	23.9	V	1.86	11.42	37.18	26.32
72.1	216.10	31.3	H	1.86	11.42	44.58	18.92
72.1	288.10	11.1	H	2.15	15.35	28.60	34.90
72.1	360.10	10.0	H	2.56	14.90	27.46	36.04
72.1	432.10	11.9	H	2.90	17.22	32.02	31.48

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Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity	Coax Loss dB	Correction Factor dB	Field Strength dBuV/m	Margin dB
LOW POWER							
72.1	72.12	74.7	V	1.01	6.25	81.96	16.04
72.1	72.12	75.6	H	1.01	6.25	82.86	15.14
72.1	144.00	17.7	V	1.38	15.86	34.94	28.56
72.1	144.00	25.2	H	1.38	15.86	42.44	21.06
72.1	216.10	24.8	H	1.86	11.42	38.08	25.42
72.1	216.10	21.4	V	1.86	11.42	34.68	28.82
72.1	288.10	10.8	H	2.15	15.35	28.30	35.20
72.1	360.10	10.1	H	2.56	14.90	27.56	35.94
72.1	432.10	11.5	H	2.90	17.22	31.62	31.88
COAX							
ANTENNA							
HIGH POWER							
75.9	75.90	86.9	V	1.03	7.29	95.22	2.78
75.9	75.90	88.9	H	1.03	7.29	97.22	0.78
75.9	151.90	30.6	V	1.42	16.65	48.67	14.83
75.9	151.90	38.8	H	1.42	16.65	56.87	6.63
75.9	227.90	46.0	H	1.91	11.46	59.37	4.13
75.9	227.90	37.0	V	1.91	11.46	50.37	13.13
75.9	303.90	13.3	H	2.22	13.81	29.33	34.17
75.9	303.90	11.4	V	2.22	13.81	27.43	36.07
75.9	379.80	14.5	V	2.68	15.20	32.38	31.12
75.9	379.80	20.7	H	2.68	15.20	38.58	24.92
MEDIUM POWER							
75.9	75.91	80.6	V	1.03	7.29	88.92	9.08
75.9	75.91	84.7	H	1.03	7.29	93.02	4.98
75.9	151.90	36.8	H	1.42	16.65	54.87	8.63
75.9	151.90	29.3	V	1.42	16.65	47.37	16.13
75.9	227.90	30.2	V	1.91	11.46	43.57	19.93
75.9	227.90	39.0	H	1.91	11.46	52.37	11.13
75.9	303.90	9.7	H	2.22	13.81	25.73	37.77
75.9	379.80	14.0	H	2.68	15.20	31.88	31.62
LOW POWER							
75.9	75.92	74.1	V	1.03	7.29	82.42	15.58
75.9	75.92	78.1	H	1.03	7.29	86.42	11.58
75.9	151.90	22.2	V	1.42	16.65	40.27	23.23
75.9	151.90	28.4	H	1.42	16.65	46.47	17.03
75.9	227.90	24.4	V	1.91	11.46	37.77	25.73
75.9	227.90	31.9	H	1.91	11.46	45.27	18.23
75.9	303.90	11.5	H	2.22	13.81	27.53	35.97
75.9	379.80	11.1	H	2.68	15.20	28.98	34.52

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Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuv	Ant. Polarity	Coax Loss dB	Correction Factor dB	Field Strength dBuv/m	Margin dB
TELESCOPIC							
WHIP							
HIGH POWER							
75.9	75.93	83.9	H	1.03	7.30	92.23	5.77
75.9	75.93	89.5	V	1.03	7.30	97.83	0.17
75.9	151.90	34.1	V	1.42	16.65	52.17	11.33
75.9	151.90	27.8	H	1.42	16.65	45.87	17.63
75.9	227.90	35.8	H	1.91	11.46	49.17	14.33
75.9	227.90	39.7	V	1.91	11.46	53.07	10.43
75.9	303.90	14.5	V	2.22	13.81	30.53	32.97
75.9	379.80	19.4	V	2.68	15.20	37.28	26.22
75.9	379.80	13.1	H	2.68	15.20	30.98	32.52
75.9	455.80	12.1	V	2.97	17.06	32.13	31.37
MEDIUM POWER							
75.9	75.94	77.2	H	1.03	7.30	85.53	12.47
75.9	75.94	86.4	V	1.03	7.30	94.73	3.27
75.9	151.90	22.6	H	1.42	16.65	40.67	22.83
75.9	151.90	29.4	V	1.42	16.65	47.47	16.03
75.9	227.90	35.1	V	1.91	11.46	48.47	15.03
75.9	227.90	30.1	H	1.91	11.46	43.47	20.03
75.9	303.90	9.6	H	2.22	13.81	25.63	37.87
75.9	303.90	12.4	V	2.22	13.81	28.43	35.07
75.9	379.80	14.6	V	2.68	15.20	32.48	31.02
75.9	455.80	12.1	V	2.97	17.06	32.13	31.37
LOW POWER							
76.0	75.95	70.9	H	1.03	7.30	79.23	18.77
76.0	75.95	80.4	V	1.03	7.30	88.73	9.27
76.0	151.90	15.8	H	1.42	16.65	33.87	29.63
76.0	151.90	21.8	V	1.42	16.65	39.87	23.63
76.0	227.90	25.6	H	1.91	11.46	38.97	24.53
76.0	227.90	29.5	V	1.91	11.46	42.87	20.63
76.0	303.90	11.1	V	2.22	13.81	27.13	36.37
76.0	379.80	10.3	V	2.68	15.20	28.18	35.32
RUBBER DUCK							
HIGH POWER							
76.0	75.96	80.3	H	1.03	7.31	88.64	9.36
76.0	75.96	86.9	V	1.03	7.31	95.24	2.76
76.0	151.90	16.4	V	1.42	16.65	34.47	29.03
76.0	151.90	13.0	H	1.42	16.65	31.07	32.43
76.0	227.90	10.1	V	1.91	11.46	23.47	40.03
76.0	227.90	12.4	H	1.91	11.46	25.77	37.73

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Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity	Coax Loss dB	Correction Factor dB	Field Strength dBuV/m	Margin dB
MEDIUM POWER							
76.0	75.97	80.7	V	1.03	7.31	89.04	8.96
76.0	75.97	74.1	H	1.03	7.31	82.44	15.56
76.0	151.90	9.6	H	1.42	16.65	27.67	35.83
76.0	151.90	12.9	V	1.42	16.65	30.97	32.53
76.0	227.90	9.6	V	1.91	11.46	22.97	40.53
76.0	227.90	10.2	H	1.91	11.46	23.57	39.93
LOW POWER							
76.0	75.98	67.8	H	1.03	7.31	76.14	21.86
76.0	75.98	74.7	V	1.03	7.31	83.04	14.96
76.0	227.90	10.1	H	1.91	11.46	23.47	40.03
DIPOLE HIGH POWER							
76.0	75.99	86.1	V	1.03	7.32	94.45	3.55
76.0	75.99	87.4	H	1.03	7.32	95.75	2.25
76.0	151.90	25.5	V	1.42	16.65	43.57	19.93
76.0	151.90	33.8	H	1.42	16.65	51.87	11.63
76.0	227.90	26.1	V	1.91	11.46	39.47	24.03
76.0	227.90	34.3	H	1.91	11.46	47.67	15.83
76.0	303.90	14.3	H	2.22	13.81	30.33	33.17
76.0	379.80	16.9	H	2.68	15.20	34.78	28.72
MEDIUM POWER							
76.0	76.00	79.6	V	1.03	7.32	87.95	10.05
76.0	76.00	81.1	H	1.03	7.32	89.45	8.55
76.0	151.90	23.3	V	1.42	16.65	41.37	22.13
76.0	151.90	32.1	H	1.42	16.65	50.17	13.33
76.0	227.90	20.4	V	1.91	11.46	33.77	29.73
76.0	227.90	27.2	H	1.91	11.46	40.57	22.93
76.0	303.90	11.0	H	2.22	13.81	27.03	36.47
76.0	379.80	11.4	H	2.68	15.20	29.28	34.22
LOW POWER							
76.1	76.10	73.2	V	1.03	7.35	81.58	16.42
76.1	76.10	74.9	H	1.03	7.35	83.28	14.72
76.1	151.90	17.0	V	1.42	16.65	35.07	28.43
76.1	151.90	24.6	H	1.42	16.65	42.67	20.83
76.1	227.90	17.9	V	1.91	11.46	31.27	32.23
76.1	227.90	21.6	H	1.91	11.46	34.97	28.53
76.1	303.90	12.4	H	2.22	13.81	28.43	35.07

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The spectrum was scanned from 10 kHz to 1000 MHz.

SAMPLE CALCULATION: $FSdBuV/m = MR(dBuV) + ACFdB$.

TEST PROCEDURE: The procedure used was ANSI C63.4-1992 Section 8.2. The frequency was scanned from 9.0 kHz to 1.0 GHz. When an emission was found, the table was rotated to produce the maximum signal strength. The EUT was measured in three(3) orthogonal planes. The unit was measured at TIMCO ENGINEERING, INC. located at 849 N.W. State Road 45 Newberry, Florida 32669.

TEST RESULTS: THE UNIT DOES MEET THE FCC REQUIREMENTS.

PERFORMED BY: JOSEPH SCOGLIO

DATE: NOVEMBER 8, 2002

APPLICANT: WILLIAMS SOUND CORPORATION

FCC ID: CNMT35

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APPLICANT: WILLIAMS SOUND CORPORATION
FCC ID: CNMT35
NAME OF TEST: POWER LINE CONDUCTED INTERFERENCE
RULES PART NO.: 15.207(a)
REQUIREMENTS: .15 - 30 MHz 48 dBuV or 250uV
TEST PROCEDURE: ANSI STANDARD C63.4-1992. The spectrum
was scanned from .15 to 30 MHz.
TEST DATA:

THE HIGHEST EMISSION READ FOR LINE 1 WAS 19.700 uV @ 180 kHz.

THE HIGHEST EMISSION READ FOR LINE 2 WAS 19.928 uV @ 180 kHz.

THE GRAPHS ON THE FOLLOWING PAGES REPRESENT THE EMISSIONS TAKEN
FOR THIS DEVICE.

TEST RESULTS: Both lines were observed. The measurements indicate
that the unit DOES appear to meet the FCC requirements for this class
of equipment.

PERFORMED BY: JOSEPH SCOGLIO DATE: NOVEMBER 8, 2002

APPLICANT: WILLIAMS SOUND CORPORATION
FCC ID: CNMT35
REPORT #: W\WSC\1085TU2\1085TU2TestReport.doc

TIMCO ENGINEERING INC.

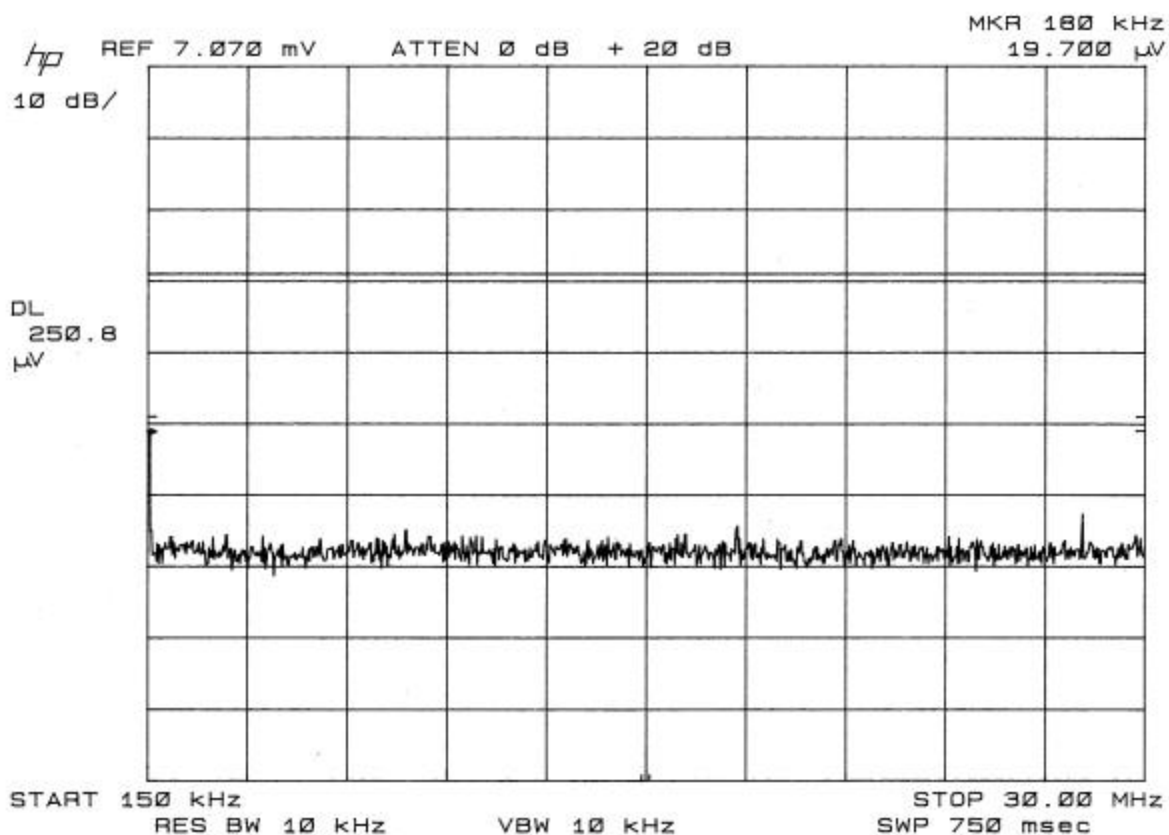
849 NW State Road 45

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POWER LINE CONDUCTED PLOT - LINE 1



APPLICANT: WILLIAMS SOUND CORPORATION

FCC ID: CNMT35

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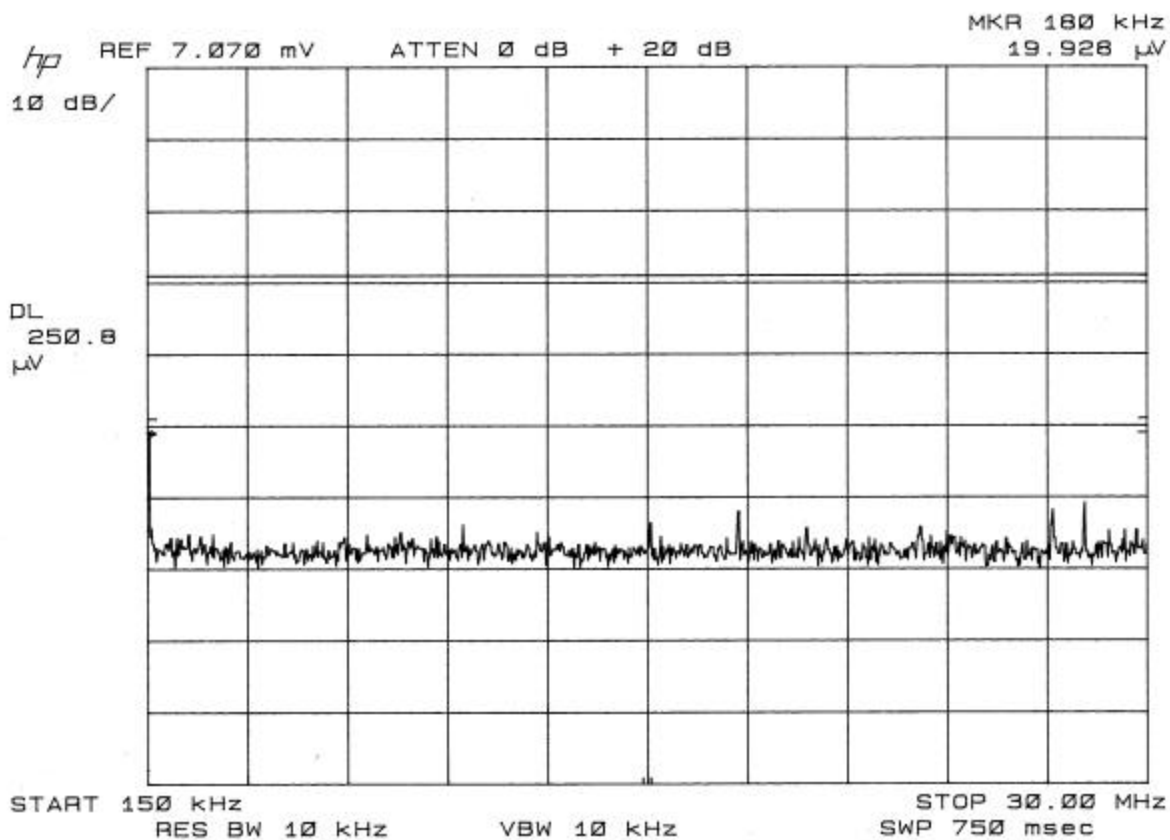
849 NW State Road 45

Newberry, Florida 32669

<http://www.timcoengr.com>

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POWER LINE CONDUCTED PLOT - LINE 2



APPLICANT: WILLIAMS SOUND CORPORATION

FCC ID: CNMT35

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APPLICANT: WILLIAMS SOUND CORPORATION

FCC ID: CNMT35

NAME OF TEST: Occupied Bandwidth

RULES PART NO. : 15.209

REQUIREMENTS: The field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 26 dB below the level of the unmodulated carrier or to the general limits of 15.209, whichever permits the higher emission levels.

THE PLOTS ON THE FOLLOWING PAGES REPRESENT THE EMISSIONS TAKEN FOR THE DEVICE.

METHOD OF MEASUREMENT: A small sample of the transmitter output was fed into the spectrum analyzer and the above photo was taken. The vertical scale is set to -10 dBm per division. The horizontal scale is set to 20 kHz per division for the narrow band plot and 50 kHz for the wide band plot.

TEST RESULTS: The unit DOES meet the FCC requirements.

PERFORMED BY: JOSEPH SCOGLIO

DATE: NOVEMBER 8, 2002

APPLICANT: WILLIAMS SOUND CORPORATION
FCC ID: CNMT35
REPORT #: W\WSC\1085TU2\1085TU2TestReport.doc

TIMCO ENGINEERING INC.

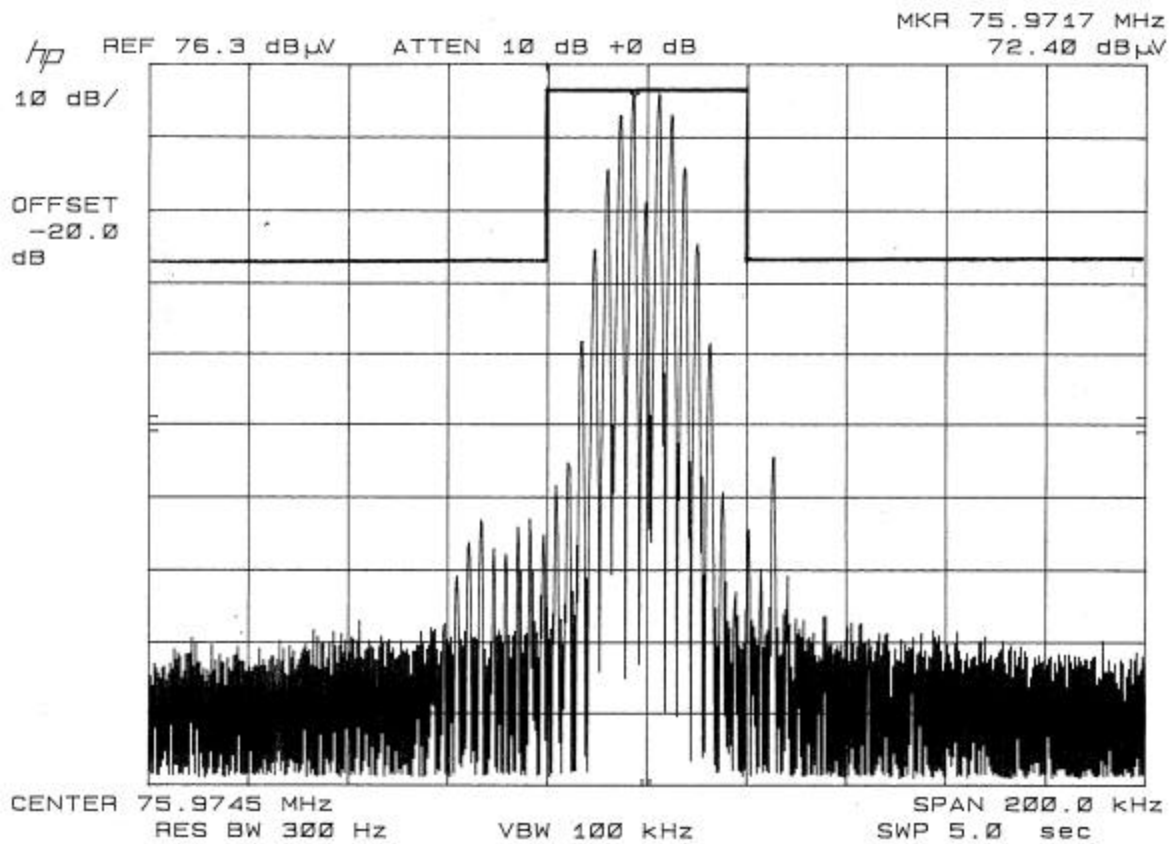
849 NW State Road 45

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OCCUPIED BANDWIDTH PLOT - NARROW BAND



APPLICANT: WILLIAMS SOUND CORPORATION

FCC ID: CNMT35

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TIMCO ENGINEERING INC.

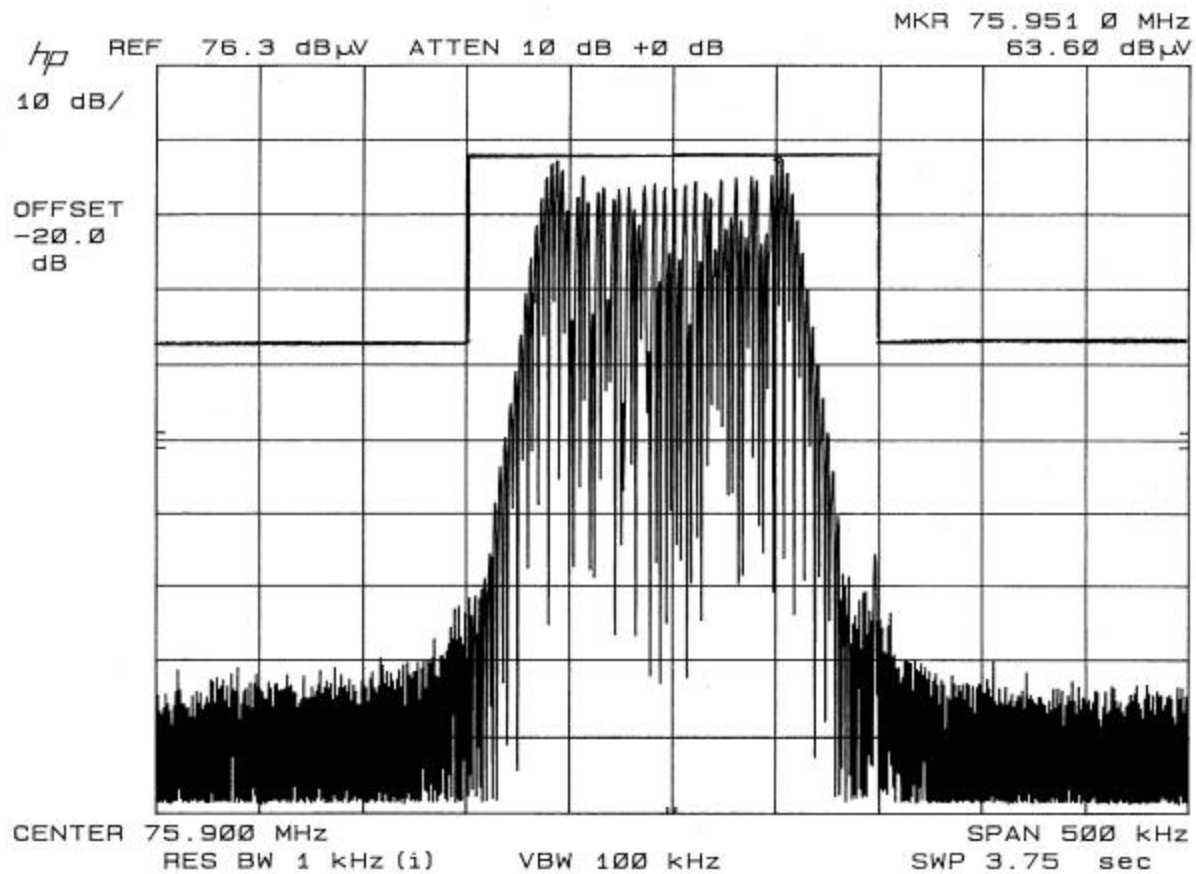
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Newberry, Florida 32669

<http://www.timcoengr.com>

888.472.2424 F 352.472.2030 email: sid@timcoengr.com

OCCUPIED BANDWIDTH PLOT - WIDE BAND



APPLICANT: WILLIAMS SOUND CORPORATION

FCC ID: CNMT35

REPORT #: W\WSC\1085TU2\1085TU2TestReport.doc

TIMCO ENGINEERING INC.

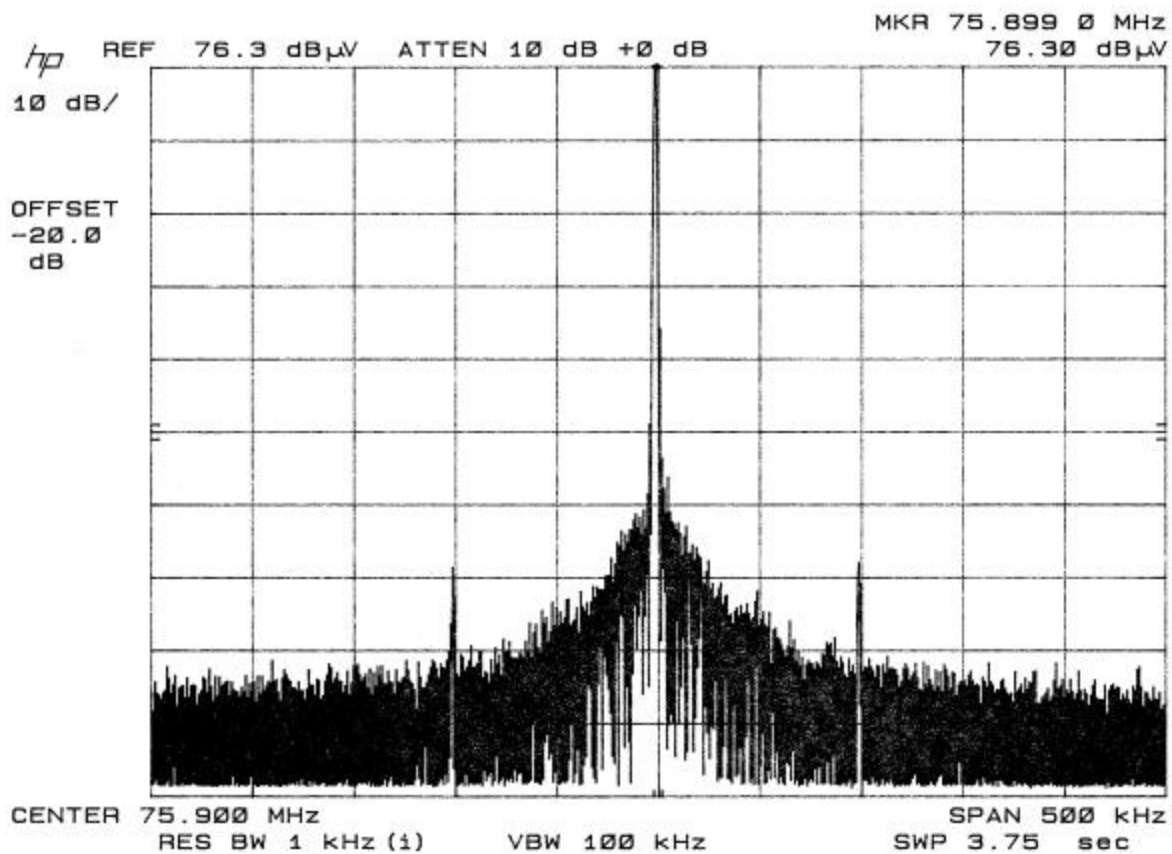
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OCCUPIED BANDWIDTH PLOT - CW



APPLICANT: WILLIAMS SOUND CORPORATION

FCC ID: CNMT35

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