Radiated Emissions Test Report

Product Tested:

Name: Scanner/ AM/FM Headphone Radio
Model: DR100

Prepared for:

Driver's Radio
266 Oneida Trail
Greensburg, IN 47240
Tel: (812) 527-2928
Fax: (812) 527-2928

Prepared by:

RheinTexas, Inc.
1701 East Plano Parkway, Suite 150
Plano, TX 75074
Tel: (972) 509-2566
Fax: (972) 509-0073

REPORT PREPARED BY: Kay Harris

Report Number: 9901019-1
Issue Date: 30 April, 1999

NVLAP® *Accredited by the National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under laboratory code 200245-0*

FCC ID: OKXDR100

EMC Engineering and Testing Services

Radiated Emissions Conformance Statement

Report Number: 9901019-1
Product Name: Scanner/ AM/FM Headphone Radio
Model: DR100

We, the undersigned, hereby state that the proper standards and procedures were followed as detailed in this test record. Furthermore, we attest that the data contained within this report is accurate and concise within the bounds of the standards and our company procedures.

Daniel Wilkerson
Sr. EMC Technician

I, the undersigned, hereby declare that the equipment tested and referenced in this report conforms to the identified standard(s) as described in this attached test record. There were no modifications made to the equipment in order to achieve compliance with these standards.

Furthermore, there was no deviation from, additions to or exclusions from the ANSI 63.4 1992-test methodology.

Signature: Michael Cantwell

Date: 30 April, 1999

Full Name: Michael Cantwell, PE

Location: Plano, Texas

Title: NARTE EMC Engineer (EMC-002019-NE)
Signatory for NVLAP

FCC ID: OKXDR100

1701 East Plano Parkway, Suite 150
Plano, TX 75074
972 509-2566 FAX 972 509-0073

TABLE OF CONTENTS

FIGURE INDEX

TABLE INDEX

1. Executive Summary

The following report for EMC compliance of a Class B scanning receiver is prepared on behalf of Electronic Design Consultants in accordance with the rules of the Federal Communications Commission (47 CFR 15) and the EMC Directive (89/336/EEC as amended by 91/31/EEC) of the European Union.

This report covers testing for the AM/FM Radio Receiver and all testing was performed on the 28th of January, the 9th of February and the 2nd, 3rd, 10th and 11th of March.

All equipment configurations and measurements contained in this report were performed in accordance with the revision of the standards listed in this report. Also, the instrumentation and facilities utilized for the measurements conform to all appropriate standards. Calibration checks are performed yearly on the instruments by a local calibration lab, with traceability to the National Institute of Standards and Technology (NIST).

All radiated and conducted emission measurements are performed manually at RheinTexas, Inc. The radiated emission measurements required by the rules were performed on a 10m open area test site (OATS) maintained by RheinTexas, Inc., 1701 East Plano Parkway, Suite 150, Plano, Texas 75074, USA. Complete site descriptions and site attenuation measurement data are maintained at the test facility and can be made available upon request. The Power Line Conducted Emission Measurements were performed in a shielded enclosure also located at the same facility. The radiated and conducted measurement sites have been listed with the Federal Communications Commission (FCC).

1.1 Modifications to EUT

There were no modifications made.

1.2 Special Accessories

There were no special accessories found necessary as a result of this testing.

2. Test Facility

The open area test site used to collect the radiated emissions data and the shielded room used to collect the conducted emissions data have been listed by the Federal Communications Commission (FCC, per ANSI C63.4) and approved by the Voluntary Control Council on Interference (VCCI, Japan).

3. EUT Configuration

3.1 Technical Description

AM/FM Radio Receiver and UHF scanning receiver headphones. The AM or FM radio will be audible until the scanning receiver locks onto an active channel. The active channel will mute the AM or FM and the UHF will be audible. The UHF scanning receiver is capable of tuning in the frequency range from 450 MHz to 470 MHz.

It is not possible, per 47 CFR 15.121(a), to modify this scanning receiver to intercept the cellular phone band. Using this receiver at any frequency above 573 MHz, without making extensive and difficult design modifications, disallows the possibility of tuning into the cellular band. The following technical reasons support this:

- The frequency data in the memory cards is encoded for security.
- The firmware contained in the microcontroller only processes the 18 least significant bits of the 24 bit frequency data words; thus the highest tuneable frequency is limited to 573.8928. Modifying this code would require replacement of the microcontroller chip encoded with new firmware.

- While the VCO is technically capable of tuning to 1300 MHz, this would require extensive modifications to the VCO tank circuit and the PLL control loop filter circuit.
- The RF band filter and the first mixer integrated circuit are designed to receive frequencies below 500 MHz. It would have to be replaced with a different integrated circuit and the RF band filter would have to be redesigned.

3.2 Test Configuration(s)

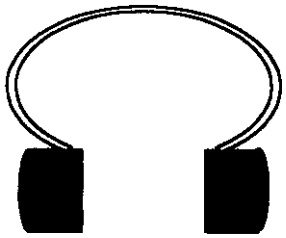

Figure 1 - Block Diagram of System Configuration

The system was configured for testing in a typical fashion (as a customer would normally use it). A list of the equipment under test (EUT) and its support equipment is found below.

Table 1 - Components in Block Diagram

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Headphones(EUT)	Driver's Radio	DR100	RTX#100709	None

Table 2 - Additional Components

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
450MHz Programming Card (EUT)	Driver's Radio	450MHZ Card	RTX#100782	None
460MHz Programming Card (EUT)	Driver's Radio	460MHZ Card	RTX#100707	None
470MHz Programming Card (EUT)	Driver's Radio	470MHZ Card	RTX#100783	None

3.3 Exercise Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The single frequency programming cards were used to test the scanning receiver at 3 different frequencies.

4.2 Radiated Emissions Measurements

The limits utilized are from CISPR-22: 1993/EN55022: 1994.

4.2.1 Test Methodology

Whenever possible, and before final measurements of radiated emissions are made on the open-field three/ten meter range, the EUT is scanned indoors at a three meter distance (or one meter distance if necessary) in order to determine its emissions spectrum signature. The physical arrangement of the test system and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. This process is either repeated, or performed, during final radiated emissions measurements on the open-field range, at each frequency, in order to insure that maximum emission amplitudes are obtained. RheinTexas works diligently to ensure that worst case modes, physical arrangement of the test system and associated cabling produce maximum emission levels.

Final radiated emissions measurements were made on the 10-meter, open-field test site. The EUT was placed on a nonconductive turntable approximately 0.8 meters above the ground plane. The spectrum was examined from 30 MHz to 1000 MHz. When any clock exceeds 108 MHz but less than 500 MHz, the emissions of the EUT are also measured between 1 to 2 GHz using an average detector with the resolution bandwidth set at 1 MHz. For clocks greater than 500 MHz and less than 1 GHz, the emissions of the EUT are also measured between 1 and 5 GHz.

At each frequency, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters in order to determine the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarizations. The spectrum analyzer's 6-dB bandwidth was set to 120 kHz, and the analyzer was operated in the CISPR quasi-peak detection mode. The highest emission amplitudes relative to the appropriate limit were measured and recorded in this report.

4.2.2 Test Limits

The tables below list the EN55022 / CISPR-22 radiated emission limits. The EUT to antenna distance used at RheinTexas is always 10m unless otherwise noted. In addition to the CISPR 22 requirements, limits have been imposed above 1 GHz for compliance with the limits found in Part 15 of the FCC rules (47CFR).

Table 3 - CISPR-22 Class A Radiated Emissions

Frequency	Limit (dBµV/m)		
(MHz)	30m	10m	3 m
30 to 230	30	40	50
230 to 1000	37	47	57
≥ 1000[1]	--	49.5	60

Table 4 - CISPR-22 Class B Radiated Emissions

Frequency	Limit (dBµV/m)	
(MHz)	10m	3m
30 to 230	30	40
230 to 1000	37	47
≥ 1000[1]	43.5	54

[1] This FCC Limit actually begins at 960 MHz. The lower limit is used from 960 to 1000 MHz to fully comply with the requirements of CISPR 22.

4.2.3 Radiated Emissions Data

All readings are quasi-peak unless stated otherwise. The pk notation in the receiver reading denotes that this measurement was taken using the peak detector.

Table 5 - Radiated Emissions Data (TRANSMITTING @ 450mHZ)

Emission Frequency (MHz)	Det	Antenna Polarity (H/V)	Turntable Azimuth (deg)	Antenna Height (m)	Analyzer Reading (dBµV)	Site Correction Factor (dB/m)	Emission Level (dBµV/m)	EN55022 / CISPR22 Limit (dBµV/m)	EN55022 / CISPR22 Margin (dBµV/m)	Pass/ Fail	Comments
64.207	Qp	H	0	4.0	12.9	7.9	20.8	30.0	-9.2	Pass	
64.207	Qp	V	0	1.0	11.4	7.9	19.3	30.0	-10.7	Pass	
127.580	Qp	V	100	3.0	11.7	13.8	25.5	30.0	-4.5	Pass	
127.581	Qp	H	0	4.0	9.9	13.8	23.7	30.0	-6.3	Pass	
128.440	Qp	H	0	4.0	10.0	13.8	23.8	30.0	-6.2	Pass	
192.000	Qp	V	0	1.0	6.3	12.2	18.5	30.0	-11.5	Pass	
192.685	Qp	H	0	4.0	9.4	12.2	21.6	30.0	-8.4	Pass	
255.060	Qp	H	0	4.0	12.3	13.0	25.3	37.0	-11.7	Pass	
256.875	Qp	V	0	1.0	7.1	13.1	20.2	37.0	-16.8	Pass	
256.880	Qp	H	0	4.0	12.4	13.1	25.5	37.0	-11.5	Pass	
315.500	Qp	V	0	1.0	10.3	15.6	25.9	37.0	-11.1	Pass	
318.820	Qp	H	0	4.0	11.0	15.7	26.7	37.0	-10.3	Pass	
321.103	Qp	H	0	4.0	11.1	15.8	26.9	37.0	-10.1	Pass	
382.590	Qp	H	0	1.0	11.4	17.4	28.8	37.0	-8.2	Pass	
385.320	Qp	H	0	1.0	11.3	17.4	28.7	37.0	-8.3	Pass	
385.320	Qp	V	0	1.0	6.2	17.4	23.6	37.0	-13.4	Pass	
900.000	Qp	H	110	4.0	7.9	24.2	32.1	37.0	-4.9	Pass	
900.000	Qp	V	175	1.9	8.3	24.2	32.5	37.0	-4.5	Pass	
963.760	Qp	H	0	1.0	5.4	25.4	30.8	37.0	-6.2	Pass	
963.760	Qp	V	0	1.0	-5.0	25.4	20.4	37.0	-16.6	Pass	
1023.000	Av	V	0	1.0	-8.9	26.0	17.1	43.5	-26.4	Pass	
1023.800	Av	H	0	1.0	-5.3	26.0	20.7	43.5	-22.8	Pass	
1027.530	Av	H	0	1.0	-5.6	26.1	20.5	43.5	-23.0	Pass	
1027.530	Av	V	130	1.3	-2.3	26.1	23.8	43.5	-19.7	Pass	
1541.225	Av	V	115	3.0	5.7	29.6	35.3	43.5	-8.2	Pass	
1541.290	Av	H	190	3.0	9.7	29.6	39.3	43.5	-4.2	Pass	
1927.000	Av	V	0	1.0	-3.3	32.7	29.4	43.5	-14.1	Pass	
1927.530	Av	H	0	1.0	-3.7	32.7	29.0	43.5	-14.5	Pass	
2891.000	Av	H	350	1.0	27.6	9.0	36.6	43.5	-6.9	Pass	
2891.000	Av	V	0	1.0	29.9	9.0	38.9	43.5	-4.6	Pass	
3082.500	Av	V	350	1.0	27.5	10.2	37.7	43.5	-5.8	Pass	
3082.590	Av	H	0	1.0	28.1	10.2	38.3	43.5	-5.2	Pass	
3596.300	Av	V	0	1.0	29.1	10.6	39.7	43.5	-5.6	Pass	
3596.370	Av	H	350	1.0	26.8	10.6	37.4	43.5	-6.1	Pass	
4110.000	Av	H	0	1.0	26.6	13.4	40.0	43.5	-3.5	Pass	
4110.000	Av	V	350	1.0	27.3	13.4	40.7	43.5	-2.8	Pass	
4623.000	Av	H	350	1.0	26.6	10.3	36.9	43.5	-6.6	Pass	
4623.000	Av	V	0	1.0	25.4	10.3	35.7	43.5	-7.8	Pass	

Notes:

The First LO (513.7657MHz) was mixed witht eh video carrier for channel 21. An exhaustive search could not locate this emission.

Table 6 - Radiated Emissions Data (TRANSMITTING @ 460mHZ)

Emission Frequency (MHz)	Det	Antenna Polarity (H/V)	Turntable Azimuth (deg)	Antenna Height (m)	Analyzer Reading (dBµV)	Site Correction Factor (dB/m)	Emission Level (dBµV/m)	EN55022 / CISPR22 Limit (dBµV/m)	EN55022 / CISPR22 Margin (dBµV/m)	Pass/ Fail	Comments
65.640	Qp	V	100	2.0	18.1	7.8	25.9	30.0	-4.1	Pass	
65.765	Qp	H	220	3.8	18.0	7.8	25.8	30.0	-4.2	Pass	
131.260	Qp	H	0	1.0	9.4	13.7	23.1	30.0	-6.9	Pass	
131.265	Qp	V	0	1.0	10.8	13.7	24.5	30.0	-5.5	Pass	
196.900	Qp	V	150	1.0	3.6	12.3	15.9	30.0	-14.1	Pass	
262.590	Qp	V	0	1.0	6.7	13.4	20.1	37.0	-16.9	Pass	
393.890	Qp	H	0	1.0	-.4	17.6	17.2	37.0	-19.8	Pass	
393.895	Qp	V	0	1.0	6.2	17.6	23.8	37.0	-13.2	Pass	
523.210	Qp	H	0	1.0	5.8	20.1	25.9	37.0	-11.1	Pass	
523.370	Qp	V	0	1.0	5.0	20.1	25.1	37.0	-11.9	Pass	
654.210	Qp	H	170	3.7	9.5	21.6	31.1	37.0	-5.9	Pass	
654.213	Qp	V	190	2.4	11.1	21.6	32.7	37.0	-4.3	Pass	
785.060	Qp	H	0	1.0	5.7	22.8	28.5	37.0	-8.5	Pass	
785.060	Qp	V	0	1.0	5.7	22.8	28.5	37.0	-8.5	Pass	
920.000	Qp	H	210	3.4	7.2	24.6	31.8	37.0	-5.2	Pass	
920.000	Qp	V	240	1.5	8.6	24.6	33.2	37.0	-3.8	Pass	
1050.000	Av	H	0	1.0	.9	26.1	27.0	43.5	-16.5	Pass	
1050.000	Av	V	170	1.0	.9	26.1	27.0	43.5	-16.5	Pass	
1575.600	Av	H	170	1.0	11.3	30.0	41.3	43.5	-2.2	Pass	
1575.600	Av	V	110	3.0	9.9	30.0	39.9	43.5	-3.6	Pass	
1970.000	Av	V	0	1.0	2.3	33.0	35.3	43.5	-8.2	Pass	
1970.300	Av	H	0	1.0	2.1	33.0	35.1	43.5	-8.4	Pass	
3140.000	Av	H	0	1.0	29.4	10.1	39.5	43.5	-6	Pass	
3140.000	Av	V	350	1.0	27.3	10.1	37.4	43.5	-6.1	Pass	
3676.188	Av	H	340	1.0	28.0	11.4	39.4	43.5	-4.1	Pass	
3676.260	Av	V	320	1.0	27.8	11.4	39.2	43.5	-4.3	Pass	
4201.000	Av	H	0	1.0	26.8	12.6	39.4	43.5	-4.1	Pass	
4201.000	Av	V	0	1.0	27.3	12.6	39.9	43.5	-3.6	Pass	
4972.000	Av	H	0	1.0	23.7	12.1	35.8	43.5	-7.7	Pass	
4972.000	Av	V	350	1.0	22.9	12.1	35.0	43.5	-8.5	Pass	

Table 7 - Radiated Emissions Data (TRANSMITTING @ 470mHZ)

Emission Frequency (MHz)	Det	Antenna Polarity (H/V)	Turntable Azimuth (deg)	Antenna Height (m)	Analyzer Reading (dBµV)	Site Correction Factor (dB/m)	Emission Level (dBµV/m)	EN55022 / CISPR22 Limit (dBµV/m)	EN55022 / CISPR22 Margin (dBµV/m)	Pass/ Fail	Comments
133.700	Qp	H	0	1.0	10.0	13.7	23.7	30.0	-6.3	Pass	
133.700	Qp	V	200	1.0	12.0	13.7	25.7	30.0	-4.3	Pass	
134.450	Qp	H	0	3.7	8.1	13.7	21.8	30.0	-8.2	Pass	
134.580	Qp	V	180	1.0	4.0	13.7	17.7	30.0	-12.3	Pass	
201.430	Qp	H	35	4.0	14.0	12.4	26.4	30.0	-3.6	Pass	
201.430	Qp	V	210	2.5	12.0	12.4	24.4	30.0	-5.6	Pass	
266.490	Qp	V	0	1.0	5.5	13.6	19.1	37.0	-17.9	Pass	
267.600	Qp	H	140	1.0	6.5	13.6	20.1	37.0	-16.9	Pass	
267.600	Qp	V	0	1.0	10.4	13.6	24.0	37.0	-13.0	Pass	
268.312	Qp	V	0	1.0	6.2	13.7	19.9	37.0	-17.1	Pass	
333.110	Qp	H	0	4.0	5.3	16.1	21.4	37.0	-15.6	Pass	
333.115	Qp	V	0	1.0	5.5	16.1	21.6	37.0	-15.4	Pass	
335.389	Qp	V	0	1.0	3.7	16.1	19.8	37.0	-17.2	Pass	
399.730	Qp	H	0	4.0	6.3	17.8	24.1	37.0	-12.9	Pass	
399.737	Qp	V	0	1.0	6.2	17.8	24.0	37.0	-13.0	Pass	
401.100	Qp	V	0	1.0	6.3	17.8	24.1	37.0	-12.9	Pass	
402.760	Qp	H	0	4.0	7.4	17.9	25.3	37.0	-11.7	Pass	
402.760	Qp	V	0	1.0	6.1	17.9	24.0	37.0	-13.0	Pass	
466.070	Qp	H	0	4.0	4.4	19.1	23.5	37.0	-13.5	Pass	
466.075	Qp	V	0	1.0	5.5	19.1	24.6	37.0	-12.4	Pass	
468.800	Qp	V	0	1.0	5.3	19.2	24.5	37.0	-12.5	Pass	
532.000	Qp	H	0	4.0	5.0	20.1	25.1	37.0	-11.9	Pass	
532.000	Qp	V	0	1.0	5.0	20.1	25.1	37.0	-11.9	Pass	
534.800	Qp	H	0	4.0	5.1	20.2	25.3	37.0	-11.7	Pass	
534.800	Qp	V	0	1.0	5.1	20.2	25.3	37.0	-11.7	Pass	
536.620	Qp	V	100	2.8	14.5	20.2	34.7	37.0	-2.3	Pass	
599.600	Qp	H	0	4.0	5.5	20.9	26.4	37.0	-10.6	Pass	
599.600	Qp	V	0	1.0	5.5	20.9	26.4	37.0	-10.6	Pass	
670.875	Qp	V	0	1.0	5.5	21.8	27.3	37.0	-9.7	Pass	
670.908	Qp	H	0	4.0	6.6	21.8	28.4	37.0	-8.6	Pass	
688.500	Qp	H	0	4.0	5.7	22.0	27.7	37.0	-9.3	Pass	
688.500	Qp	V	0	1.0	5.6	22.0	27.6	37.0	-9.4	Pass	
737.850	Qp	V	0	1.0	7.0	22.5	29.5	37.0	-7.5	Pass	
802.200	Qp	V	0	1.0	5.7	22.9	28.6	37.0	-8.4	Pass	
802.225	Qp	H	0	4.0	3.2	22.9	26.1	37.0	-10.9	Pass	
804.930	Qp	V	0	1.0	5.6	23.0	28.6	37.0	-8.4	Pass	
1006.200	Av	H	0	4.0	.4	26.0	26.4	43.5	-17.1	Pass	
1006.275	Av	V	170	1.0	-3.8	26.0	22.2	43.5	-21.3	Pass	
1023.087	Av	H	0	1.0	.6	26.0	26.6	43.5	-16.9	Pass	
1023.300	Av	V	180	1.0	-4.2	26.0	21.8	43.5	-21.7	Pass	
1046.200	Av	H	0	4.0	.7	26.1	26.8	43.5	-16.7	Pass	
1046.640	Av	V	180	1.0	.9	26.1	27.0	43.5	-16.5	Pass	
1069.600	Av	H	0	1.0	1.1	26.1	27.2	43.5	-16.3	Pass	
1069.650	Av	V	180	1.0	1.2	26.1	27.3	43.5	-16.2	Pass	
1073.240	Av	V	180	1.0	1.2	26.1	27.3	43.5	-16.2	Pass	
1140.000	Av	V	180	1.0	.7	26.6	27.3	43.5	-16.2	Pass	
1207.425	Av	V	180	1.0	1.1	27.1	28.2	43.5	-15.3	Pass	
1337.000	Av	V	180	1.0	2.3	28.1	30.4	43.5	-13.1	Pass	
1341.500	Av	V	180	1.0	2.1	28.1	30.2	43.5	-13.3	Pass	
1470.750	Av	V	180	1.0	2.7	29.0	31.7	43.5	-11.8	Pass	
1475.710	Av	V	0	1.0	2.8	29.0	31.8	43.5	-11.7	Pass	

1480.630	Av	V	0	1.0	2.8	29.1	31.9	43.5	-11.6	Pass	
1542.790	Av	V	0	1.0	2.5	29.7	32.2	43.5	-11.3	Pass	
1604.475	Av	V	180	1.0	2.1	30.3	32.4	43.5	-11.1	Pass	
1609.900	Av	H	210	3.7	10.5	30.3	40.8	43.5	-2.7	Pass	
1609.900	Av	V	190	1.0	6.8	30.3	37.1	43.5	-6.4	Pass	
1676.900	Av	H	0	1.0	3.8	30.5	34.3	43.5	-9.2	Pass	
1676.940	Av	V	0	1.0	3.7	30.5	34.2	43.5	-9.3	Pass	
1744.000	Av	H	0	4.0	3.4	30.9	34.3	43.5	-9.2	Pass	
1744.020	Av	V	0	1.0	3.4	30.9	34.3	43.5	-9.2	Pass	
1811.800	Av	H	0	4.0	3.1	31.6	34.7	43.5	-8.8	Pass	
1811.825	Av	V	0	1.0	3.2	31.6	34.8	43.5	-8.7	Pass	
1878.100	Av	H	0	4.0	2.6	32.4	35.0	43.5	-8.5	Pass	
1878.180	Av	V	0	1.0	2.6	32.4	35.0	43.5	-8.5	Pass	
1945.200	Av	H	0	4.0	2.5	32.8	35.3	43.5	-8.2	Pass	
1945.250	Av	V	0	1.0	2.5	32.8	35.3	43.5	-8.2	Pass	
2146.400	Av	H	0	1.0	30.4	2.9	33.3	43.5	-10.2	Pass	
2146.490	Av	V	350	1.0	30.1	2.9	33.0	43.5	-10	Pass	
2683.100	Av	H	350	1.0	28.8	6.6	35.4	43.5	-8.1	Pass	
2683.110	Av	V	0	1.0	29.2	6.6	35.8	43.5	-7.7	Pass	
3219.700	Av	H	0	1.0	28.2	10.0	38.2	43.5	-5.3	Pass	
3219.730	Av	V	350	1.0	28.4	10.0	38.4	43.5	-5.1	Pass	
4292.000	Av	H	350	1.0	26.3	11.7	38.0	43.5	-5.5	Pass	
4292.000	Av	V	0	1.0	28.2	11.7	39.9	43.5	-3.6	Pass	
4829.600	Av	H	0	1.0	24.4	11.4	35.8	43.5	-7.7	Pass	
4829.600	Av	V	350	1.0	24.6	11.4	36.0	43.5	-7.5	Pass	

NOTES:

The 2nd LO (67.0779MHz) and first IF (66.6229MHz) could not be found. The video of channel 4 (67.25MHz) was very close to these potential emissions. An exhaustive search was conducted.

Table 8 - Radiated Emissions Data (97.1\ FM)

Emission Frequency (MHz)	Det	Antenna Polarity (H/V)	Turntable Azimuth (deg)	Antenna Height (m)	Analyzer Reading (dBµV)	Site Correction Factor (dB/m)	Emission Level (dBµV/m)	EN55022 / CISPR22 Limit (dBµV/m)	EN55022 / CISPR22 Margin (dBµV/m)	Pass/ Fail	Comments
64.221	Qp	H	180	4.0	28.8	-13.0	15.8	30.0	-14.2	Pass	
64.221	Qp	V	180	1.0	29.2	-13.0	16.2	30.0	-13.8	Pass	
86.400	Qp	H	180	4.0	28.3	-11.1	17.2	30.0	-12.8	Pass	
86.400	Qp	V	180	1.0	25.0	-11.1	13.9	30.0	-16.1	Pass	
107.800	Qp	H	300	4.0	32.6	-7.9	24.7	30.0	-5.3	Pass	
107.800	Qp	V	180	1.0	31.9	-7.9	24.0	30.0	-6.0	Pass	
127.980	Qp	H	200	4.0	33.2	-7.0	26.2	30.0	-3.8	Pass	
127.986	Qp	V	105	1.0	32.6	-7.0	25.6	30.0	-4.4	Pass	
255.970	Qp	H	180	4.0	27.3	-7.7	19.6	37.0	-17.4	Pass	
255.972	Qp	V	180	1.0	25.3	-7.7	17.6	37.0	-19.4	Pass	
383.950	Qp	H	180	4.0	26.9	-3.3	23.6	37.0	-13.4	Pass	
383.959	Qp	V	180	1.0	25.6	-3.3	22.3	37.0	-14.7	Pass	
450.100	Qp	H	180	4.0	27.4	-1.8	25.6	37.0	-11.4	Pass	
450.108	Qp	V	180	1.0	23.3	-1.8	21.5	37.0	-15.5	Pass	
511.950	Qp	H	180	4.0	24.0	-.6	23.4	37.0	-13.6	Pass	
511.957	Qp	V	180	1.0	25.5	-.6	24.9	37.0	-12.1	Pass	
513.753	Qp	H	180	4.0	32.8	-.5	32.3	37.0	-4.7	Pass	
513.766	Qp	V	180	1.0	28.9	-.5	28.4	37.0	-8.6	Pass	
639.930	Qp	H	180	1.0	22.4	.9	23.3	37.0	-13.7	Pass	
639.932	Qp	V	180	1.0	25.0	.9	25.9	37.0	-11.1	Pass	
767.910	Qp	H	180	1.0	21.1	2.0	23.1	37.0	-13.9	Pass	
767.918	Qp	V	180	1.0	25.6	2.0	27.6	37.0	-9.4	Pass	
900.190	Qp	H	130	4.0	22.9	3.5	26.4	37.0	-10.6	Pass	
900.198	Qp	V	200	1.0	29.1	3.5	32.6	37.0	-4.4	Pass	
963.760	Qp	H	180	4.0	25.6	4.7	30.3	37.0	-6.7	Pass	
963.765	Qp	V	205	1.0	24.6	4.7	29.3	37.0	-7.7	Pass	
1027.500	Av	H	180	1.0	12.1	5.5	17.6	43.5	-25.9	Pass	
1027.530	Av	V	180	1.0	30.0	5.5	35.5	43.5	-8.0	Pass	

Notes:
Scan 97.1 FM, IF=86.4, 107.8
The first few harmonics of the 1st Lo (10.7MHz) above 30MHz could not be found.

Table 9 - Radiated Emissions Data (104.5\FM)

Emission Frequency (MHz)	Det	Antenna Polarity (H/V)	Turntable Azimuth (deg)	Antenna Height (m)	Analyzer Reading (dBµV)	Site Correction Factor (dB/m)	Emission Level (dBµV/m)	EN55022 / CISPR22 Limit (dBµV/m)	EN55022 / CISPR22 Margin (dBµV/m)	Pass/ Fail	Comments
93.800	Qp	V	0	1.0	26.4	-9.6	16.8	30.0	-13.2	Pass	
93.800	Qp	H	215	1.5	34.5	-9.6	24.9	30.0	-5.1	Pass	
115.638	Qp	H	180	1.0	29.5	-7.1	22.4	30.0	-7.6	Pass	
133.650	Qp	H	0	1.0	35.4	-7.1	28.3	30.0	-1.7	Pass	
133.708	Qp	V	180	1.0	20.6	-7.1	13.5	30.0	-16.5	Pass	
134.158	Qp	V	100	1.0	21.7	-7.1	14.6	30.0	-15.4	Pass	
155.755	Qp	V	0	1.0	25.6	-7.9	17.7	30.0	-12.3	Pass	
201.230	Qp	V	100	1.0	23.8	-8.1	15.7	30.0	-14.3	Pass	
267.362	Qp	H	0	1.0	27.3	-7.1	20.2	37.0	-16.8	Pass	
267.400	Qp	V	150	1.0	21.5	-7.1	14.4	37.0	-22.6	Pass	
335.390	Qp	V	180	1.0	21.2	-4.6	16.6	37.0	-20.4	Pass	
402.450	Qp	V	10	1.0	21.9	-2.8	19.1	37.0	-17.9	Pass	
469.543	Qp	V	100	1.0	20.8	-1.4	19.4	37.0	-17.6	Pass	
470.084	Qp	V	100	1.0	23.2	-1.4	21.8	37.0	-15.2	Pass	
534.800	Qp	V	200	1.0	22.9	-.3	22.6	37.0	-14.4	Pass	
536.719	Qp	V	320	1.0	35	-.3	34.7	37.0	-2.3	Pass	
603.000	Qp	H	170	1.0	20.6	.5	21.1	37.0	-15.9	Pass	
603.012	Qp	V	0	1.0	26.0	.5	26.5	37.0	-10.5	Pass	
940.000	Qp	V	180	1.0	25.4	4.3	29.7	37.0	-7.3	Pass	
1073.275	Av	H	210	3.7	32.2	5.6	37.8	43.5	-5.7	Pass	
1073.358	Av	V	205	1.4	32.7	5.6	38.3	43.5	-5.2	Pass	

Notes:

104.5 IF = 93.8, 115.2

Table 10 - Radiated Emissions Data (107.5\FM)

Emission Frequency (MHz)	Det	Antenna Polarity (H/V)	Turntable Azimuth (deg)	Antenna Height (m)	Analyzer Reading (dBµV)	Site Correction Factor (dB/m)	Emission Level (dBµV/m)	EN55022 / CISPR22 Limit (dBµV/m)	EN55022 / CISPR22 Margin (dBµV/m)	Pass/ Fail	Comments
65.757	Qp	V	130	1.9	38.2	-13.0	25.2	30.0	-4.8	Pass	
65.765	Qp	H	190	3.6	37.1	-13.0	24.1	30.0	-5.9	Pass	
96.800	Qp	H	0	1.0	29.2	-9.1	20.1	30.0	-9.9	Pass	
118.300	Qp	H	150	1.0	25.4	-6.9	18.5	30.0	-11.5	Pass	
131.290	Qp	H	0	1.0	25.3	-7.0	18.3	30.0	-11.7	Pass	
131.290	Qp	V	205	3.0	32.3	-7.0	25.3	30.0	-4.7	Pass	
196.940	Qp	H	140	2.8	63.7	-8.2	55.5	30.0	25.5	Pass	
196.940	Qp	V	0	1.0	27.3	-8.2	19.1	30.0	-10.9	Pass	
262.590	Qp	H	0	1.0	26.3	-7.4	18.9	37.0	-18.1	Pass	
262.590	Qp	V	0	1.0	27.3	-7.4	19.9	37.0	-17.1	Pass	
328.240	Qp	H	0	1.0	26.4	-4.8	21.6	37.0	-15.4	Pass	
328.450	Qp	V	0	1.0	25.6	-4.8	20.8	37.0	-16.2	Pass	
459.850	Qp	H	0	1.0	25.9	-1.6	24.3	37.0	-12.7	Pass	
459.850	Qp	V	0	1.0	25.8	-1.6	24.2	37.0	-12.8	Pass	
985.190	Qp	H	100	4.0	28.6	5.1	33.7	37.0	-3.3	Pass	
985.190	Qp	V	230	1.4	27.6	5.1	32.7	37.0	-4.3	Pass	
1046.000	Av	H	0	1.0	14.5	5.5	20.0	43.5	-23.5	Pass	
1046.000	Av	V	0	1.0	14.5	5.5	20.0	43.5	-23.5	Pass	

Notes:

IF FREQUENCY=96.8, 118.3\

Table 11 - Radiated Emissions Data (580/AM)

Emission Frequency (MHz)	Det	Antenna Polarity (H/V)	Turntable Azimuth (deg)	Antenna Height (m)	Analyzer Reading (dBµV)	Site Correction Factor (dB/m)	Emission Level (dBµV/m)	EN55022 / CISPR22 Limit (dBµV/m)	EN55022 / CISPR22 Margin (dBµV/m)	Pass/ Fail	Comments
31.900	Qp	V	170	1.0	27.1	-1.8	25.3	30.0	-4.7	Pass	
33.395	Qp	H	110	3.8	28.1	-2.2	25.9	30.0	-4.1	Pass	
36.701	Qp	V	30	2.0	27.8	-3.4	24.4	30.0	-5.6	Pass	
39.977	Qp	V	340	1.0	30.3	-5.2	25.1	30.0	-4.9	Pass	
49.500	Qp	V	190	1.0	33.6	-9.8	23.8	30.0	-6.2	Pass	
49.868	Qp	H	140	3.0	29.9	-9.9	20.0	30.0	-10.0	Pass	
109.050	Qp	H	0	4.0	26.5	-7.7	18.8	30.0	-11.2	Pass	
109.050	Qp	V	0	1.0	26.5	-7.7	18.8	30.0	-11.2	Pass	

5. Test Equipment

The following test equipment was used to perform the radiated and conducted emissions testing. All the equipment is calibrated by competent calibration laboratories traceable to NIST.

The Test column indicates which equipment was utilized to perform the radiated and conducted testing. An "R" in this column indicates that it was used for radiated emissions testing and a "C" in this column indicates that it was used for conducted emissions testing.

Table 13 - Test Equipment List

Test	Manufacturer	Model	Description	Serial Number	Last Cal	Next Cal
	Hewlett Packard	8566B	Spectrum Analyzer	2816A16178 2747A05126	30-Dec-98	30-Dec-99
	Hewlett Packard	85650A	Quasi-Peak Adapter	3303A01859	30-Dec-98	30-Dec-99
	Rhein Tech Labs	PR-1040	Amplifier	N/A	27-Mar-98	27-Mar-99
R	RheinTexas	Radiated Cable	Site 1NE	R002	27-Mar-98	27-Mar-99
R	Chase	CBL6112A	Bilog Antenna	2149	5-Nov-98	5-Nov-99
R	Hewlett Packard	8546A	EMI Receiver	3265A00348 3448A00288	28-Dec-98	28-Dec-99
R	RheinTexas	Radiated Cable	Site 2NW	R003	27-Mar-98	27-Mar-99
	Chase	CBL6112A	Bilog Antenna	2150	7-May-98	7-May-99
	Hewlett Packard	8567A	Spectrum Analyzer	2602A00153 2542A11108	31-Jul-98	31-Jul-99
	Hewlett Packard	85650A	Quasi-Peak Adapter	3303A01832	31-Jul-98	31-Jul-99
	Solar	9252-50-R-24-BNC	LISN	961023	19-Aug-98	19-Aug-99
	RheinTexas	Conducted Cables	Coaxial Cables	C001	19-Aug-98	19-Aug-99