Engineering and Testing for EMC and Safety Compliance

APPLICATION FOR FCC CLASS B CERTIFICATION

SCANNING RECEIVER

Alinco, Inc.
438 Amapola Ave.
Suite 130
Torrance, CA 90501

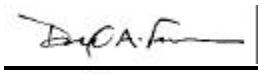
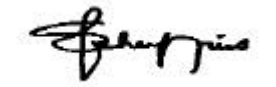
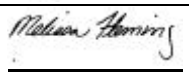
MODEL: DR-135T
FCC ID: EUG DR-135T

July 29, 2000

This report concerns (check one): **Original Grant:** X **Class II Change:**	
Equipment Type: Scanning Receiver	
Deferred grant requested per 47 CFR 0.457 (d) (1) (ii)? Yes: **No:** X	
If yes, defer until: _____	
Company name agrees to notify the Commission by: _____(date) of the intended date of announcement of the product so that the grant can be issued on that date.	
Transition Rules Request per 15.37? Yes: **No:** X	
If no, assumed Part 15, subpart B for unintentional radiators - the new 47 CFR. [10-1-90 Edition] provision.	

I, the undersigned, hereby declare that the equipment tested and referenced in this report conforms to the identified standard(s) as described above. No modifications were made during testing to the equipment in order to achieve compliance with these standards. Furthermore, there was no deviation from, additions to or exclusions from the ANSI C63.4 test methodology.

REPORT PREPARED BY:

Supervising Engineer:	**Desmond A. Fraser**	
EMC Emission Technician:	**K. Franck Schuppius**	
Administrative Writer:	**Melissa Fleming**	

Rhein Tech Laboratories, Inc.

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1.0 GENERAL INFORMATION

The following Application for FCC Type Certification of a Scanning Receiver is prepared on behalf of Alinco, Inc. in accordance with Part 2, and Part 15, Subparts A and B of the Federal Communications Commissions rules and regulations. The Equipment Under Test (EUT) was the DR-135T, FCC ID: EUG DR-135T. The test results reported in this document relate only to the item that was tested.

All measurements contained in this Application were conducted in accordance with ANSI C63.4 Methods of Measurement of Radio Noise Emissions, 1992. The instrumentation utilized for the measurements conforms to the ANSI C63.4 standard for EMI and Field Strength Instrumentation. Some accessories are used to increase sensitivity and prevent overloading of the measuring instrument. These are explained in the appendix of this report. Calibration checks are performed regularly on the instruments, and all accessories including the high pass filter, preamplifier and cables.

All radiated emissions measurement were performed manually at Rhein Tech, Incorporated. The radiated emissions measurements required by the rules were performed on the three meter, open field, test range maintained by Rhein Tech Laboratories, Inc., 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. Complete description and site attenuation measurement data have been placed on file with the Federal Communications Commission. The power line conducted emission measurements were performed in a shielded enclosure also located at the Herndon, Virginia facility. The FCC accepts Rhein Tech Laboratories, Inc. as a facility available to do measurement work for others on a contractual basis.

1.1 STANDARDS REFERENCED

STANDARDS REFERENCED FOR THIS REPORT	
FCC RULES AND REGULATION	PART 2 SUBPART J
FCC RULES AND REGULATION	PART 15 §15.109
FCC RULES AND REGULATION	PART 15 §15.111
FCC RULES AND REGULATION	PART 15 § 15.121
ANSI	C63.4:1992

1.2 BASIC INFORMATION ON THE EUT

FREQUENCY RANGE MHz	OUTPUT POWER (W)	FREQUENCY TOLERANCE	EMISSION DESIGNATOR
118-135.995	N/A	N/A	N/A
136-173.995	N/A	N/A	N/A

1.3 MODIFICATIONS

Modifications were not made to the EUT during testing.

1.4 RELATED SUBMITTAL(S)/GRANT(S)

This is an original certification submission.

1.5 TEST METHODOLOGY

Radiated testing was performed according to the procedures in ANSI C63.4 1992. Radiated testing was performed at an antenna to EUT distance of 3 meters.

1.6 TEST FACILITY

The open area test site and conducted measurement facility used to collect the radiated data is located on the parking lot of Rhein Tech Laboratories, Inc. 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report dated June 24, 1996, submitted to and approved by the Federal Communication Commission to perform AC line conducted and radiated emissions testing (ANSI C63.4 1992).

2.0 SYSTEM TEST CONFIGURATION

2.1 JUSTIFICATION

To complete the test configuration required by the FCC, the receiver was connected to an external antenna, which receives a signal from a signal generator output. With the antenna installed and a DC power supply connected, the receiver indicator was used to determine optional reception. The EUT's IF, local oscillators, and crystal oscillators and harmonics of each were investigated. The EUT was tested as a scanning receiver and a digital interface device. The data reflected in this report satisfies both conditions. The EUT receives in two bands 118MHz to 135.995 MHz and 136 MHz to 173.995 MHz, therefore it was investigated and tested using the following channels: receive band 1; 118.00 MHz, 126.995 MHz, and 135.995 MHz. Receive band 2; 136.000 MHz, 154.995 MHz, and 173.995 MHz. The deice was also tested as a digital interface device.

2.2 EXERCISING THE EUT

The EUT was exercised using a Hewlett Packard Signal Generator to generate a continuous wave frequency, which was received by and activated the EUT receiver portion under test.

2.3 TEST SYSTEM DETAILS

The FCC Identifiers for all equipment, plus descriptions of all cables used in the tested system (including inserted cards, which have grants) are:

EXTERNAL PERIPHERALS

PART	MANUFACTURER	MODEL	SERIAL NUMBER	FCC ID	CABLE DESCRIPTION	RTL BAR CODE
POWER SUPPLY	ALINCO	DM-340MVT	F002143	N/A	UNSHIELDED POWER	010275
TRANSCEIVER (EUT)	**ALINCO**	**DR-135T**	**T000502**	**EUG DR-135T**	**UNSHIELDED POWER**	**012375**
SIGNAL GENERATOR	HEWLETT PACKARD	8660C SYNTHESIZED SIGNAL GENERATOR	1947A02956	N/A	SHIELDED POWER	900059
SPEAKER MICROPHONE	**ALINCO**	**EMS-47**	**N/A**	**N/A**	**SHIELDED I/O**	**012009**
SERIAL PORT LOAD	DATALUX	DATABRICK	N/A	N/A	SHIELDED I/O	N/A

2.4 EMISSIONS EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. LAB
AMPLIFIER	HEWLETT PACKARD	11975A	2304A00348	TEST EQUITY
AMPLIFIER (S/A 1)	RHEIN TECH	PR-1040	00001	RTL
AMPLIFIER (S/A 2)	RHEIN TECH	RTL2	900723	RTL
AMPLIFIER (S/A 3)	RHEIN TECH	8447F	2944A03783	RTL
AMPLIFIER (S/A 4)	RHEIN TECH	8447D	2727A05397	RTL
BICONICAL/LOG ANTENNA 1	ANTENNA RESEARCH	LPB-2520	1037	LIBERTY LABS
BICONICAL/LOG ANTENNA 2	ANTENNA RESEARCH	LPB-2520	1036	LIBERTY LABS
FIELD SITE SOURCE	EMCO	4610	9604-1313	RTL
FILTER (ROOM 1)	SOLAR	8130	947305	RTL
FILTER (ROOM 2)	SOLAR	8130	947306	RTL
HARMONIC MIXER 1	HEWLETT PACKARD	11970K	2332A00563	TELOGY
HARMONIC MIXER 2	HEWLETT PACKARD	11970A	2332A01199	TELOGY
HORN ANTENNA 1	EMCO	3160-10	9606-1033	EMCO
HORN ANTENNA 2	EMCO	3160-9	9605-1051	EMCO
HORN ANTENNA 3	EMCO	3160-7	9605-1054	EMCO
HORN ANTENNA 4	EMCO	3160-8	9605-1044	EMCO
HORN ANTENNA 5	EMCO	3160-03	9508-1024	EMCO
LISN (ROOM 1/L1)	SOLAR	7225-1	900727	ACUCAL
LISN (ROOM 1/L2)	SOLAR	7225-1	900726	ACUCAL
LISN (ROOM 2/L1)	SOLAR	7225-1	900078	ACUCAL
LISN (ROOM 2/L2)	SOLAR	7225-1	900077	ACUCAL
PRE-AMPLIFIER	HEWLETT PACKARD	8449B OPT	3008A00505	TELOGY
QUASI-PEAK ADAPTER (S/A 1)	HEWLETT PACKARD	85650A	3145A01599	ACUCAL
QUASI-PEAK ADAPTER (S/A 2)	HEWLETT PACKARD	85650A	2811A01276	ACUCAL
QUASI-PEAK ADAPTER (S/A 3)	HEWLETT PACKARD	85650A	2521A00473	ACUCAL
QUASI-PEAK ADAPTER (S/A 4)	HEWLETT PACKARD	85650A	2521A01032	ACUCAL
RF PRESELECTOR (S/A 1)	HEWLETT PACKARD	85685A	3146A01309	ACUCAL
SIGNAL GENERATOR (HP)	HEWLETT PACKARD	8660C	1947A02956	ACUCAL
SIGNAL GENERATOR (WAVETEK)	WAVETEK	3510B	4952044	ACUCAL
SPECTRUM ANALYZER 1	HEWLETT PACKARD	8566B	3138A07771	ACUCAL
SPECTRUM ANALYZER 2	HEWLETT PACKARD	8567A	2841A00614	ACUCAL
SPECTRUM ANALYZER 4	HEWLETT PACKARD	8567A	2727A00535	ACUCAL
TUNABLE DIPOLE	EMCO	3121	274	LIBERTY LABS
ANTENNA	ATM	WR08	08443-6	ATM
MIXER	OLESON	M08HW	F80814-1	OLESON
MIXER	OLESON	M05HW	G80814-1	OLESON
DIPLEXER	OLESON	M05HW	G80814-1	OLESON
MIXER	HEWLETT PACKARD	11970U	2332A01110	ACUCAL
MIXER	HEWLETT PACKARD	11970V	2521A00512	TELOGY
MIXER	HEWLETT PACKARD	11970W	2521A00710	TELOGY
ANTENNA	ATM	WR15	15-443-6	ATM
ANTENNA	ATM	WR10	10-443-6	ATM
ANTENNA	ATM	WR05	05-443-6	ATM
SWEEP GENERATOR	HEWLETT PACKARD	83752A	3610A00866	HEWLETT PACKARD

2.5 TEST METHODOLOGY

CONDUCTED EMISSIONS MEASUREMENTS

The power line conducted emission measurements were performed in a Series 81 type shielded enclosure manufactured by Rayproof. The EUT was assembled on a wooden table 80 centimeters high. Power was fed to the EUT through a 50 ohm / 50 microhenry Line Impedance Stabilization Network (EUT LISN). The EUT LISN was fed power through an A.C. filter box on the outside of the shielded enclosure. The filter box and EUT LISN housing are bonded to the ground plane of the shielded enclosure. A second LISN, the peripheral LISN, provides isolation for the EUT test peripherals. This peripheral LISN was also fed A.C. power. A metal power outlet box, which is bonded to the ground plane and electrically connected to the peripheral LISN, powers the EUT host peripherals.

The spectrum analyzer was connected to the A.C. line through an isolation transformer. The 50-ohm output of the EUT LISN was connected to the spectrum analyzer input through a Solar 400 kHz high-pass filter. The filter is used to prevent overload of the spectrum analyzer from noise below 400 kHz. Conducted emission levels were measured on each current-carrying line with the spectrum analyzer operating in the CISPR quasi-peak mode (or peak mode if applicable). The analyzer's 6 dB bandwidth was set to 9 kHz. No video filter less than 10 times the resolution bandwidth was used. Average measurements are performed in linear mode using a 10 kHz resolution bandwidth, a 1 Hz video bandwidth, and by increasing the sweep time in order to obtain a calibrated measurement. The emission spectrum was scanned from (150/450) kHz to 30 MHz. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in this report.

RADIATED EMISSIONS MEASUREMENTS

Before final measurements of radiated emissions were made on the open-field three/ten meter range, the EUT was scanned indoors at one meter and three meter distances, 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 was repeated during final radiated emissions measurements on the open-field range, at each frequency, in order to insure that maximum emission amplitudes were attained.

Final radiated emissions measurements were made on the three-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 using a Hewlett Packard 8566B spectrum analyzer, a Hewlett Packard 85650A quasi-peak adapter, and EMCO log periodic and biconical antenna. In order to gain sensitivity, a New Circuits ZHL-4240W preamplifier was connected in series between the antenna and the input of the spectrum analyzer.

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. No video filter less than 10 times the resolution bandwidth was used. For frequencies above 1 GHz, the EUT was tested with the resolution bandwidth set at 1 MHz and the video bandwidth at 10 Hz for averaged limit as stated in the FCC's rules. The highest emission amplitudes relative to the appropriate limit were measured and recorded in this report.

Note: Rhein Tech Laboratories, Inc. has implemented procedures to minimize errors that occur from test instruments, calibration, procedures, and test setups. Test instrument and calibration errors are documented from the manufacturer or calibration lab. Other errors have been defined and calculated within the Rhein Tech quality manual, section 6.1. Rhein Tech implements the following procedures to minimize errors that may occur: yearly as well as daily calibration methods, technician training, and emphasis to employees on avoiding error.

3.0 CONDUCTED EMISSION DATA

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. If the conducted emissions exceed the limit with the instrument set to the quasi-peak mode, then measurements are made in the average mode. If the quasi-peak measurement is at least 6dB higher than the amplitude in the average mode, the level measured in the quasi-peak mode may be reduced by 13dB before comparing it to the limit.

The conducted test was performed with the EUT exercise program loaded, and the emissions were scanned between 450 kHz to 30 MHz on the NEUTRAL SIDE and HOT SIDE, herein referred to as L1 and L2, respectively. The worst case data presented in the conducted tables are for 118.00MHz,126.995MHz, 154.995 MHz, and 173.995 MHz. Two other channels were investigated namely 136.995 MHz and 136.00 MHz. They were both found to be compliant.

TABLE 1: CONDUCTED EMISSIONS: (118.000 MHz)

Neutral Side (L1)

Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	FCC B QP Limit (dBuV)	FCC B QP Margin (dBuV)	FCC B AV Limit (dBuV)	FCC B AV Margin (dBuV)
0.450	Pk	39.0	0.3	39.3	48.0	-8.7	48.0	-8.7
0.668	Pk	32.0	0.4	32.4	48.0	-15.6	48.0	-15.6
1.005	Pk	21.6	0.5	22.1	48.0	-25.9	48.0	-25.9
3.038	Pk	17.5	1.2	18.7	48.0	-29.3	48.0	-29.3
6.970	Pk	18.1	1.8	19.9	48.0	-28.1	48.0	-28.1
12.560	Pk	18.3	2.2	20.5	48.0	-27.5	48.0	-27.5

Hot Side (L2)

Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	FCC B QP Limit (dBuV)	FCC B QP Margin (dBuV)	FCC B AV Limit (dBuV)	FCC B AV Margin (dBuV)
0.452	Pk	36.2	0.3	36.5	48.0	-11.5	48.0	-11.5
0.482	Pk	33.8	0.3	34.1	48.0	-13.9	48.0	-13.9
0.657	Pk	29.7	0.4	30.1	48.0	-17.9	48.0	-17.9
0.721	Pk	29.4	0.5	29.9	48.0	-18.1	48.0	-18.1
0.829	Pk	25.4	0.4	25.8	48.0	-22.2	48.0	-22.2
10.520	Pk	18.4	1.8	20.2	48.0	-27.8	48.0	-27.8

(1)Pk = Peak; QP = Quasi-Peak; Av = Average

TEST PERSONNEL:

Signature:_____ **D**ate: July 27, 2000

Typed/Printed Name: K. Franck Schuppius

TABLE 2: CONDUCTED EMISSIONS: (126.995 MHz)

Neutral Side (L1)

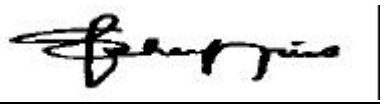
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	FCC B QP Limit (dBuV)	FCC B QP Margin (dBuV)	FCC B AV Limit (dBuV)	FCC B AV Margin (dBuV)
3.685	Pk	18.6	1.3	19.9	48.0	-28.1	48.0	-28.1
7.371	Pk	13.2	1.8	15.0	48.0	-33.0	48.0	-33.0
11.059	Pk	14.3	1.9	16.2	48.0	-31.8	48.0	-31.8
14.744	Pk	12.7	2.5	15.2	48.0	-32.8	48.0	-32.8
18.431	Pk	7.2	3.2	10.4	48.0	-37.6	48.0	-37.6
22.116	Pk	7.7	2.8	10.5	48.0	-37.5	48.0	-37.5

Hot Side (L2)

Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	FCC B QP Limit (dBuV)	FCC B QP Margin (dBuV)	FCC B AV Limit (dBuV)	FCC B AV Margin (dBuV)
3.686	Pk	20.9	1.2	22.1	48.0	-25.9	48.0	-25.9
7.372	Pk	18.0	1.7	19.7	48.0	-28.3	48.0	-28.3
11.058	Pk	18.1	1.8	19.9	48.0	-28.1	48.0	-28.1
14.744	Pk	18.1	2.4	20.5	48.0	-27.5	48.0	-27.5
18.430	Pk	16.3	3.1	19.4	48.0	-28.6	48.0	-28.6
22.116	Pk	16.5	2.5	19.0	48.0	-29.0	48.0	-29.0

(1)Pk = Peak; QP = Quasi-Peak; Av = Average

TEST PERSONNEL:

Signature: 

Date: July 27, 2000

Typed/Printed Name: K. Franck Schuppius

TABLE 3: CONDUCTED EMISSIONS: (154.995 MHZ)

Neutral Side (L1)

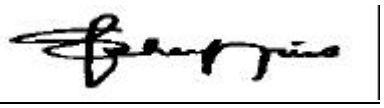
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	FCC B QP Limit (dBuV)	FCC B QP Margin (dBuV)	FCC B AV Limit (dBuV)	FCC B AV Margin (dBuV)
0.451	Pk	35.3	0.3	35.6	48.0	-12.4	48.0	-12.4
0.512	Pk	29.8	0.3	30.1	48.0	-17.9	48.0	-17.9
0.668	Pk	29.7	0.4	30.1	48.0	-17.9	48.0	-17.9
1.040	Pk	21.4	0.5	21.9	48.0	-26.1	48.0	-26.1
5.115	Pk	18.1	1.6	19.7	48.0	-28.3	48.0	-28.3
16.080	Pk	18.5	2.8	21.3	48.0	-26.7	48.0	-26.7

Hot Side (L2)

Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	FCC B QP Limit (dBuV)	FCC B QP Margin (dBuV)	FCC B AV Limit (dBuV)	FCC B AV Margin (dBuV)
0.450	Pk	36.0	0.3	36.3	48.0	-11.7	48.0	-11.7
0.664	Pk	30.1	0.4	30.5	48.0	-17.5	48.0	-17.5
1.056	Pk	20.4	0.5	20.9	48.0	-27.1	48.0	-27.1
9.420	Pk	17.7	1.9	19.6	48.0	-28.4	48.0	-28.4
18.040	Pk	17.6	3.1	20.7	48.0	-27.3	48.0	-27.3
25.020	Pk	17.6	3.1	20.7	48.0	-27.3	48.0	-27.3

(1)Pk = Peak; QP = Quasi-Peak; Av = Average

TEST PERSONNEL:

Signature: 

Date: July 27, 2000

Typed/Printed Name: K. Franck Schuppius

TABLE 4: CONDUCTED EMISSIONS: (173.995 MHZ)

Neutral Side (L1)

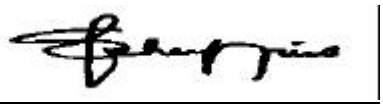
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	FCC B QP Limit (dBuV)	FCC B QP Margin (dBuV)	FCC B AV Limit (dBuV)	FCC B AV Margin (dBuV)
0.452	Pk	35.2	0.3	35.5	48.0	-12.5	48.0	-12.5
0.668	Pk	29.1	0.4	29.5	48.0	-18.5	48.0	-18.5
1.032	Pk	20.0	0.5	20.5	48.0	-27.5	48.0	-27.5
8.010	Pk	17.8	1.9	19.7	48.0	-28.3	48.0	-28.3
10.260	Pk	17.3	1.8	19.1	48.0	-28.9	48.0	-28.9
15.240	Pk	17.3	2.6	19.9	48.0	-28.1	48.0	-28.1

Hot Side (L2)

Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	FCC B QP Limit (dBuV)	FCC B QP Margin (dBuV)	FCC B AV Limit (dBuV)	FCC B AV Margin (dBuV)
0.451	Pk	35.9	0.3	36.2	48.0	-11.8	48.0	-11.8
0.668	Pk	29.9	0.4	30.3	48.0	-17.7	48.0	-17.7
1.020	Pk	19.7	0.5	20.2	48.0	-27.8	48.0	-27.8
3.648	Pk	17.8	1.2	19.0	48.0	-29.0	48.0	-29.0
9.400	Pk	18.0	1.9	19.9	48.0	-28.1	48.0	-28.1
25.080	Pk	17.9	3.1	21.0	48.0	-27.0	48.0	-27.0

(1)Pk = Peak; QP = Quasi-Peak; Av = Average

TEST PERSONNEL:

Signature: 

Date: July 27, 2000

Typed/Printed Name: K. Franck Schuppius

4.0 RADIATED EMISSION DATA

TABLE 5: RADIATED EMISSIONS: (118 MHz)

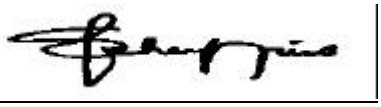
Temperature: 82°F Humidity: 54%										
Emission Frequency (MHz)	**Test Detector**	**Antenna Polarity (H/V)**	**Turntable Azimuth (deg)**	**Antenna Height (m)**	**Analyzer Reading (dBuV/m)**	**Site Correction Factor (dB/m)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Pass/ Fail**
139.681	Qp	H	0	2.2	50.1	-21.8	28.3	43.5	-15.2	Pass
279.381	Qp	H	90	1.0	45.3	-14.6	30.7	46.0	-15.3	Pass
419.087	Qp	H	0	1.0	43.6	-13.2	30.4	46.0	-15.6	Pass
558.792	Qp	H	145	1.0	43.2	-10.8	32.4	46.0	-13.6	Pass
698.473	Qp	H	135	1.0	37.9	-8.6	29.3	46.0	-16.7	Pass
838.154	Qp	H	0	1.0	36.7	-7.2	29.5	46.0	-16.5	Pass

Spectrum Analyzer settings:
Resolution bandwidth = 1 MHz; Video bandwidth = 1 MHz, Quasi peak adapter = 120 KHz

Spectrum Analyzer settings:
Resolution bandwidth = 1 MHz; Video bandwidth = 1 MHz, Quasi peak adapter = 120 KHz

All readings are quasi-peak, unless stated otherwise.

TEST PERSONNEL:

Signature: 

Date: July 28, 2000

Typed/Printed Name: K. Franck Schuppius

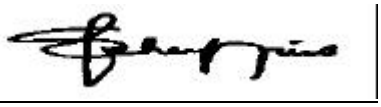
TABLE 6: RADIATED EMISSIONS: (126.995 MHz)

Temperature: 82°F Humidity: 54%									
Emission Frequency (MHz)	**Test Detector**	**Antenna Polarity (H/V)**	**Turntable Azimuth (deg)**	**Antenna Height (m)**	**Analyzer Reading (dBuV/m)**	**Site Correction Factor (dB/m)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**
148.695	Qp	H	145	2.8	53.3	-20.4	32.9	43.5	-10.6
297.390	Qp	H	0	1.0	45.6	-14.1	31.5	46.0	-14.5
446.065	Qp	H	270	1.0	48.5	-12.3	36.2	46.0	-9.8
594.779	Qp	H	0	1.0	42.2	-9.8	32.4	46.0	-13.6
743.474	Qp	H	0	1.0	41.5	-7.7	33.8	46.0	-12.2
892.169	Qp	H	0	1.0	35.0	-6.1	28.9	46.0	-17.1

Spectrum Analyzer settings:
Resolution bandwidth = 1 MHz; Video bandwidth = 1 MHz, Quasi peak adapter = 120 KHz

All readings are quasi-peak, unless stated otherwise.

TEST PERSONNEL:

Signature: 

Date: July 28,, 2000

Typed/Printed Name: K. Franck Schuppius

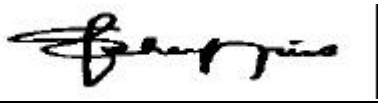
TABLE 7: RADIATED EMISSIONS: (135.995 MHz)

Temperature: 82°F Humidity: 54%										
Emission Frequency (MHz)	**Test Detector**	**Antenna Polarity (H/V)**	**Turntable Azimuth (deg)**	**Antenna Height (m)**	**Analyzer Reading (dBuV/m)**	**Site Correction Factor (dB/m)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Pass/ Fail**
157.694	Qp	H	180	1.8	54.3	-19.1	35.2	43.5	-8.3	Pass
315.389	Qp	H	90	1.0	43.9	-14.1	29.8	46.0	-16.2	Pass
473.084	Qp	H	180	1.0	51.7	-11.9	39.8	46.0	-6.2	Pass
630.779	Qp	H	145	1.0	39.3	-9.6	29.7	46.0	-16.3	Pass
788.471	Qp	H	0	1.0	36.5	-7.1	29.4	46.0	-16.6	Pass
946.164	Qp	H	90	1.0	36.6	-5.1	31.5	46.0	-14.5	Pass

Spectrum Analyzer settings:
Resolution bandwidth = 1 MHz; Video bandwidth = 1 MHz, Quasi peak adapter = 120 KHz

All readings are quasi-peak, unless stated otherwise.

TEST PERSONNEL:

Signature: 

Date: July 28, 2000

Typed/Printed Name: K. Franck Schuppius

TABLE 8: RADIATED EMISSIONS: (136.000 MHz)

Temperature: 82°F Humidity: 54%										
Emission Frequency (MHz)	**Test Detector**	**Antenna Polarity (H/V)**	**Turntable Azimuth (deg)**	**Antenna Height (m)**	**Analyzer Reading (dBuV/m)**	**Site Correction Factor (dB/m)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Pass/ Fail**
157.694	Qp	H	180	1.8	54.3	-19.1	35.2	43.5	-8.3	Pass
315.389	Qp	H	90	1.0	43.9	-14.1	29.8	46.0	-16.2	Pass
473.084	Qp	H	180	1.0	51.7	-11.9	39.8	46.0	-6.2	Pass
630.779	Qp	H	145	1.0	39.3	-9.6	29.7	46.0	-16.3	Pass
788.471	Qp	H	0	1.0	36.5	-7.1	29.4	46.0	-16.6	Pass
946.164	Qp	H	90	1.0	36.6	-5.1	31.5	46.0	-14.5	Pass

Spectrum Analyzer settings:
Resolution bandwidth = 1 MHz; Video bandwidth = 1 MHz, Quasi peak adapter = 120 KHz

All readings are quasi-peak, unless stated otherwise.

TEST PERSONNEL:

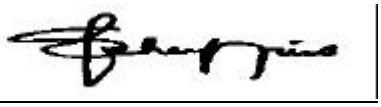
Signature: 

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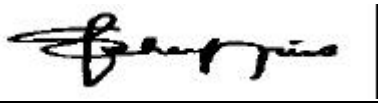
TABLE 9: RADIATED EMISSIONS: (154.995 MHz)

Temperature: 82°F Humidity: 54%										
Emission Frequency (MHz)	**Test Detector**	**Antenna Polarity (H/V)**	**Turntable Azimuth (deg)**	**Antenna Height (m)**	**Analyzer Reading (dBuV/m)**	**Site Correction Factor (dB/m)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Pass/ Fail**
133.295	Qp	H	0	1.0	42.6	-22.7	19.9	43.5	-23.6	Pass
266.590	Qp	H	0	1.0	41.9	-15.6	26.3	46.0	-19.7	Pass
399.885	Qp	H	125	1.0	37.4	-13.2	24.2	46.0	-21.8	Pass
533.180	Qp	H	145	1.0	45.4	-10.8	34.6	46.0	-11.4	Pass
666.475	Qp	H	145	1.0	38.2	-8.7	29.5	46.0	-16.5	Pass
799.770	Qp	H	150	1.0	39.5	-6.6	32.9	46.0	-13.1	Pass
933.065	Qp	H	225	1.0	38.5	-5.5	33.0	46.0	-13.0	Pass

Spectrum Analyzer settings:
Resolution bandwidth = 1 MHz; Video bandwidth = 1 MHz, Quasi peak adapter = 120 KHz
All readings are quasi-peak, unless stated otherwise.

TEST PERSONNEL:

Signature: 

Date: July 28, 2000

Typed/Printed Name: K. Franck Schuppius

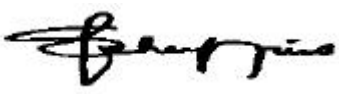
TABLE 10: RADIATED EMISSIONS: (179.995 MHz)

Temperature: 82°F Humidity: 54%										
Emission Frequency (MHz)	**Test Detector**	**Antenna Polarity (H/V)**	**Turntable Azimuth (deg)**	**Antenna Height (m)**	**Analyzer Reading (dBuV/m)**	**Site Correction Factor (dB/m)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Pass / Fail**
152.295	Qp	H	90	1.0	44.8	-19.9	24.9	43.5	-18.6	Pass
304.590	Qp	H	145	1.0	43.4	-13.9	29.5	46.0	-16.5	Pass
456.884	Qp	H	225	1.0	34.7	-11.7	23.0	46.0	-23.0	Pass
609.179	Qp	H	135	1.0	34.9	-9.4	25.5	46.0	-20.5	Pass
761.474	Qp	H	0	1.0	36.3	-7.4	28.9	46.0	-17.1	Pass
913.769	Qp	H	315	1.0	37.4	-5.9	31.5	46.0	-14.5	Pass

Spectrum Analyzer settings:
Resolution bandwidth = 1 MHz; Video bandwidth = 1 MHz, Quasi peak adapter = 120 KHz

All readings are quasi-peak, unless stated otherwise.

TEST PERSONNEL:

Signature: 

Date: July 28, 2000

Typed/Printed Name: K. Franck Schuppius

5.0 CONFORMANCE STATEMENT

STANDARDS REFERENCED FOR THIS REPORT	
FCC RULES AND REGULATION	PART 2 SUBPART J
FCC RULES AND REGULATION	PART 15 §15.109
FCC RULES AND REGULATION	PART 15 §15.111
FCC RULES AND REGULATION	PART 15 § 15.121
ANSI	C63.4:1992

I, the undersigned, hereby declare that the equipment tested and referenced in this report conforms to the identified standard(s) as described above. Modifications were not made during testing to the equipment in order to achieve compliance with these standards.

Furthermore, there was no deviation from, additions to or exclusions from the ANSI C63.4 test methodology.

Signature: 

Date: July 27, 2000

Typed/Printed Name: Desmond A. Fraser

Position: President
(NVLAP Signatory)

Accredited by the National Voluntary Accreditation Program for the specific scope of accreditation under Lab Code 20061-0.

Note: This report may not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.