Engineering and Testing for EMC and Safety Compliance

APPLICATION FOR FCC CLASS B CERTIFICATION

DUAL BAND FM TRANSCEIVER (RECEIVER PORTION)

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

MODEL: DJ-596T
FCC ID: PH3 DJ-596T

June 26, 2001

STANDARDS REFERENCED FOR THIS REPORT	
PART 2: 1999	FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS
PART 15: 1999	RADIO FREQUENCY DEVICES
ANSI C63.4-1992	STANDARD FORMAT MEASUREMENT/TECHNICAL REPORT PERSONAL COMPUTER AND PERIPHERALS
RSS-215; ISSUE 1 (PROVISIONAL)	ANALOGUE SCANNER RECEIVERS

FCC Rules Parts	Frequency Range MHz	Output Power (W)	Freq. Tolerance	Emission Designator
15.121	136.000 – 511.995 MHz	N/A	N/A	N/A

REPORT PREPARED BY:

Test Engineer: Franck Schuppius
Administrative Writer: Franck Schuppius

Rhein Tech Laboratories, Inc.

Document Number: 2001174

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1 GENERAL INFORMATION

The following Application for FCC Type Certification of a Transceiver (Receiver portion) 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 and Industry Canada RSS-215. The Equipment Under Test (EUT) was the DJ-596T, FCC ID: PH3 DJ-596T. 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 MODIFICATIONS

Modifications were not made to the EUT during testing.

1.2 RELATED SUBMITTAL(S)/GRANT(S)

This is an original certification submission.

1.3 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.

1.4 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, submitted to and approved by the Federal Communication Commission to perform AC line conducted and radiated emissions testing (ANSI C63.4 1992).

5.0 CONFORMANCE STATEMENT

STANDARDS REFERENCED FOR THIS REPORT	
PART 2: 1999	FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS
PART 15: 1999	RADIO FREQUENCY DEVICES
ANSI C63.4-1992	STANDARD FORMAT MEASUREMENT/TECHNICAL REPORT PERSONAL COMPUTER AND PERIPHERALS
RSS-215; ISSUE 1 (PROVISIONAL)	ANALOGUE SCANNER RECEIVERS

FCC Rules Parts	Frequency Range MHz	Output Power (W)	Freq. Tolerance	Emission Designator
15.121	136.000 – 511.995 MHz	N/A	N/A	N/A

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: June 26, 2001

Typed/Printed Name: Desmond A. Fraser Position: President
(NVLAP Signatory)

NVLAP *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.

2 SYSTEM TEST CONFIGURATION

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, the receiver indicator was used to determine optional reception. The EUT's IF, local oscillators, and crystal oscillators and harmonics of each were investigated. Conducted emission was measured from the AC port of the charger. All modes were investigated and tested including standby mode and scanning mode. The final radiated data was taken with the EUT locked to a set frequency.

2.1 EXERCISING THE EUT

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

2.2 TEST SYSTEM DETAILS

The FCC Identifiers for all equipment, plus descriptions of all cables used in the tested system are:

TABLE 2-1: EQUIPMENT UNDER TEST (EUT)

PART	MANUFACTURER	MODEL	SERIAL NUMBER	FCC ID	CABLE DESCRIPTION	RTL BAR CODE
TRANSCEIVER	ALINCO	DJ-596T	M000500	PH3 DJ-596T	N/A	013422

TABLE 2-2: EXTERNAL COMPONENTS IN TEST CONFIGURATION

PART	MANUFACTURER	MODEL	SERIAL NUMBER	FCC ID	CABLE DESCRIPTION	RTL BAR CODE
AC ADAPTER	ALINCO	EDC-93	A31220	N/A	UNSHIELDED POWER	013433
NiMH BATTERY	ALINCO	EBP-50N	N/A	N/A	N/A	013427
SIGNAL GENERATOR	HEWLETT PACKARD	8648C	3537A01741	N/A	SHIELDED POWER	900917
SPEAKER MICROPHONE	ALINCO	N/A	N/A	N/A	SHIELDED I/O	012009
ANTENNA	ALINCO	WHIP ANTENNA	4.5"	N/A	N/A	013425

3 CONDUCTED EMISSIONS

3.1 TEST METHODOLOGY FOR 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.

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.

3.2 CONDUCTED EMISSION TEST

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.

3.3 CONDUCTED EMISSION TEST DATA

TABLE 3-1: CONDUCTED EMISSIONS TEST {NEUTRAL SIDE (L1)} (154.995 MHZ)

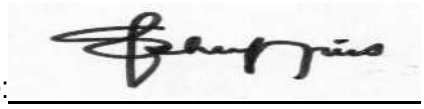
Temperature: 73°F Humidity: 44%						
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	FCC B QP Limit (dBuV)	FCC B QP Margin (dBuV)
0.485	Pk	39.4	0.7	40.1	48.0	-7.9
0.721	Pk	41.8	0.8	42.6	48.0	-5.4
0.975	Pk	33.1	0.5	33.6	48.0	-14.4
1.004	Pk	33.5	0.8	34.3	48.0	-13.7
1.488	Pk	29.9	1.0	30.9	48.0	-17.1
1.980	Pk	27.5	1.2	28.7	48.0	-19.3
2.468	Pk	22.6	1.3	23.9	48.0	-24.1
25.330	Pk	16.7	3.9	20.6	48.0	-27.4

TABLE 3-2: CONDUCTED EMISSIONS TEST {HOT SIDE (L2)} (154.995 MHZ)

Temperature: 73°F Humidity: 44%						
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)
0.508	Pk	37.3	0.7	38.0	48.0	-10.0
0.722	Pk	39.3	0.8	40.1	48.0	-7.9
0.989	Pk	27.5	0.8	28.3	48.0	-19.7
1.108	Pk	29.6	0.8	30.4	48.0	-17.6
1.588	Pk	27.4	1.0	28.4	48.0	-19.6
2.104	Pk	24.3	1.2	25.5	48.0	-22.5
2.532	Pk	21.4	1.3	22.7	48.0	-25.3
5.350	Pk	16.8	1.8	18.6	48.0	-29.4

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

TEST PERSONNEL:

Signature:  Date: June 26, 2001

Typed/Printed Name: Franck Schuppius

TABLE 3-3: CONDUCTED EMISSIONS TEST {NEUTAL SIDE (L1)} (455.995 MHZ)

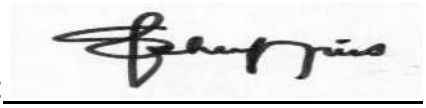
Temperature: 73°F Humidity: 44%						
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	FCC B QP Limit (dBuV)	FCC B QP Margin (dBuV)
0.487	Pk	38.8	0.7	39.5	48.0	-8.5
0.723	Pk	41.8	0.8	42.6	48.0	-5.4
0.960	Pk	32.6	0.3	32.9	48.0	-15.1
1.000	Pk	32.8	0.8	33.6	48.0	-14.4
1.496	Pk	29.5	1.0	30.5	48.0	-17.5
2.012	Pk	26.6	1.2	27.8	48.0	-20.2
2.396	Pk	22.7	1.3	24.0	48.0	-24.0
19.500	Pk	16.6	3.3	19.9	48.0	-28.1

TABLE 3-4: CONDUCTED EMISSIONS TEST {HOT SIDE (L2)} (455.995 MHZ)

Temperature: 73°F Humidity: 44%						
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)
0.502	Pk	36.7	0.7	37.4	48.0	-10.6
0.722	Pk	39.8	0.8	40.6	48.0	-7.4
0.999	Pk	28.0	0.8	28.8	48.0	-19.2
1.152	Pk	30.2	0.9	31.1	48.0	-16.9
1.580	Pk	26.4	1.0	27.4	48.0	-20.6
2.088	Pk	25.1	1.2	26.3	48.0	-21.7
2.536	Pk	20.9	1.3	22.2	48.0	-25.8
10.780	Pk	16.6	2.4	19.0	48.0	-29.0

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

TEST PERSONNEL:

Signature:  Date: June 26, 2001

Typed/Printed Name: Franck Schuppius

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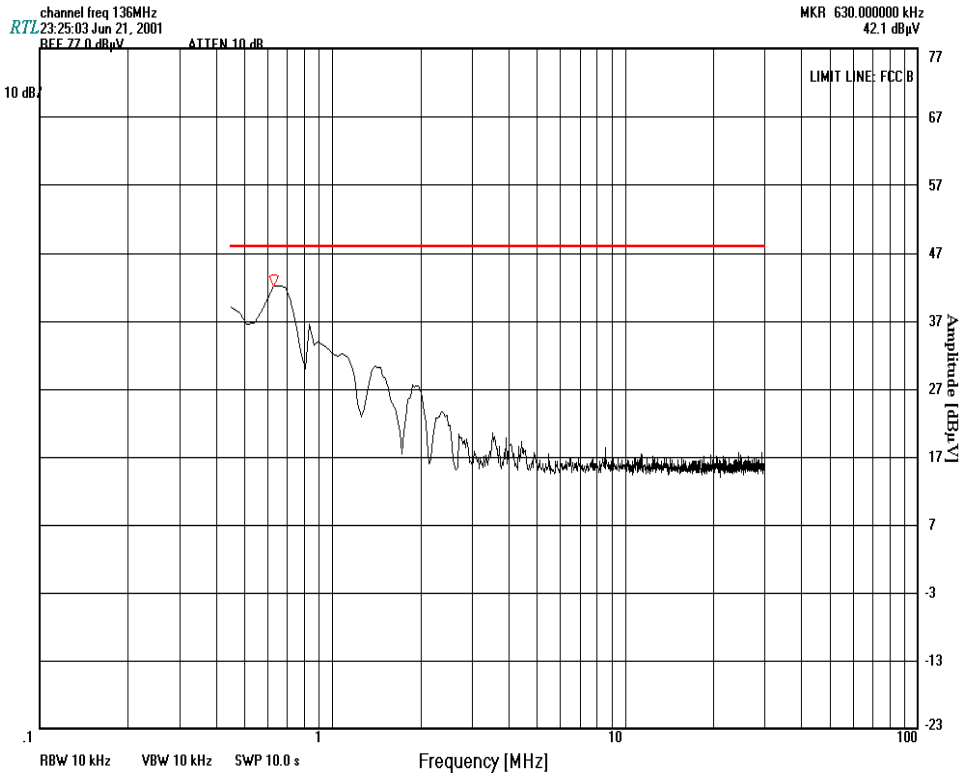
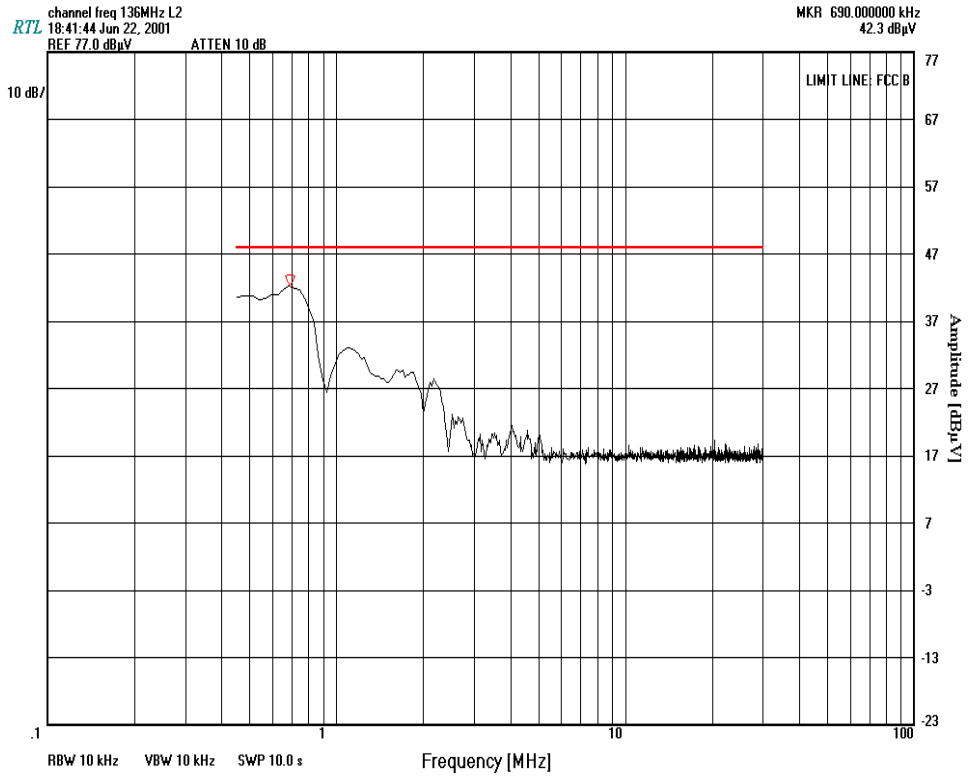
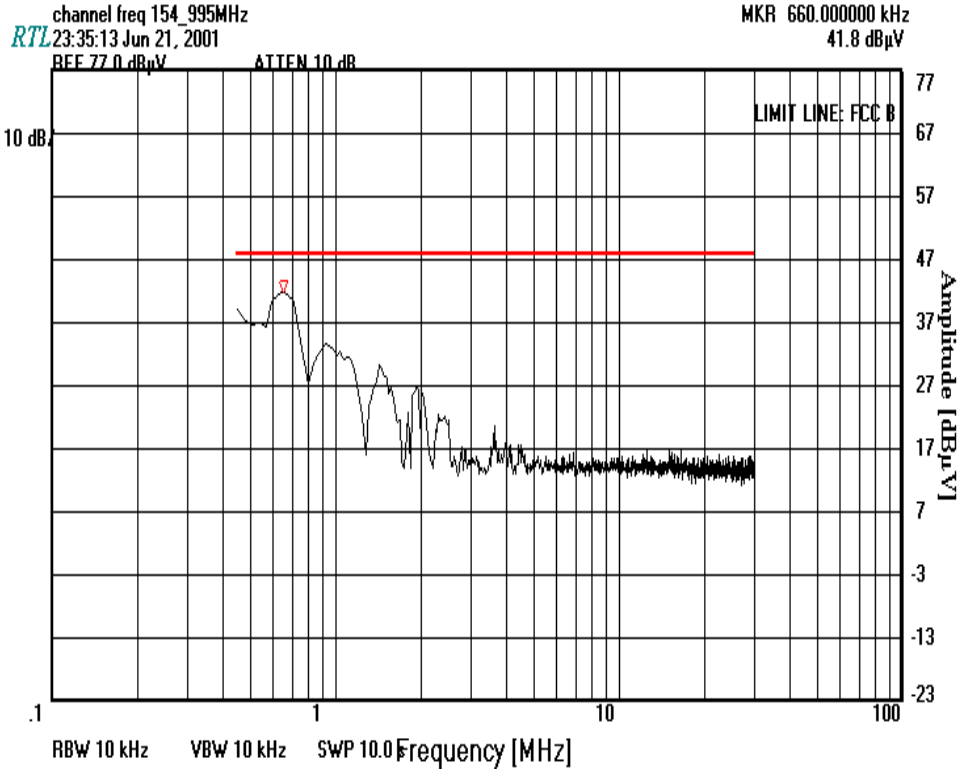
PLOT 3-1: CONDUCTED PLOT FOR CHANNEL FREQUENCY 136.000MHZ (L1)



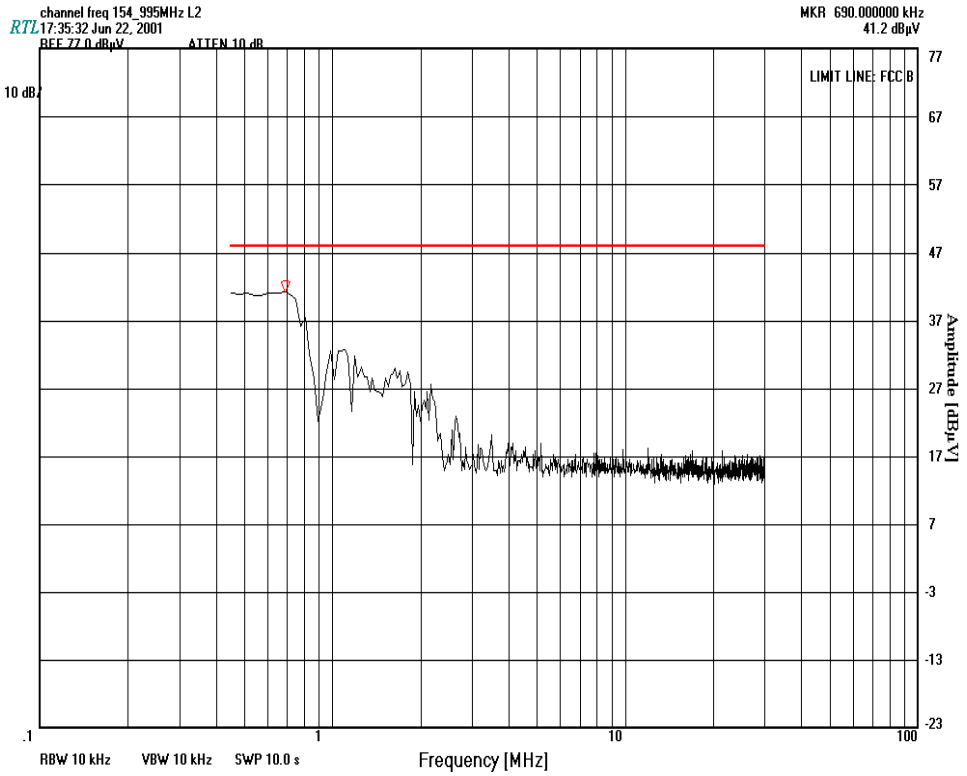
PLOT 3-2: CONDUCTED PLOT FOR CHANNEL FREQUENCY 136.000MHZ (L2)



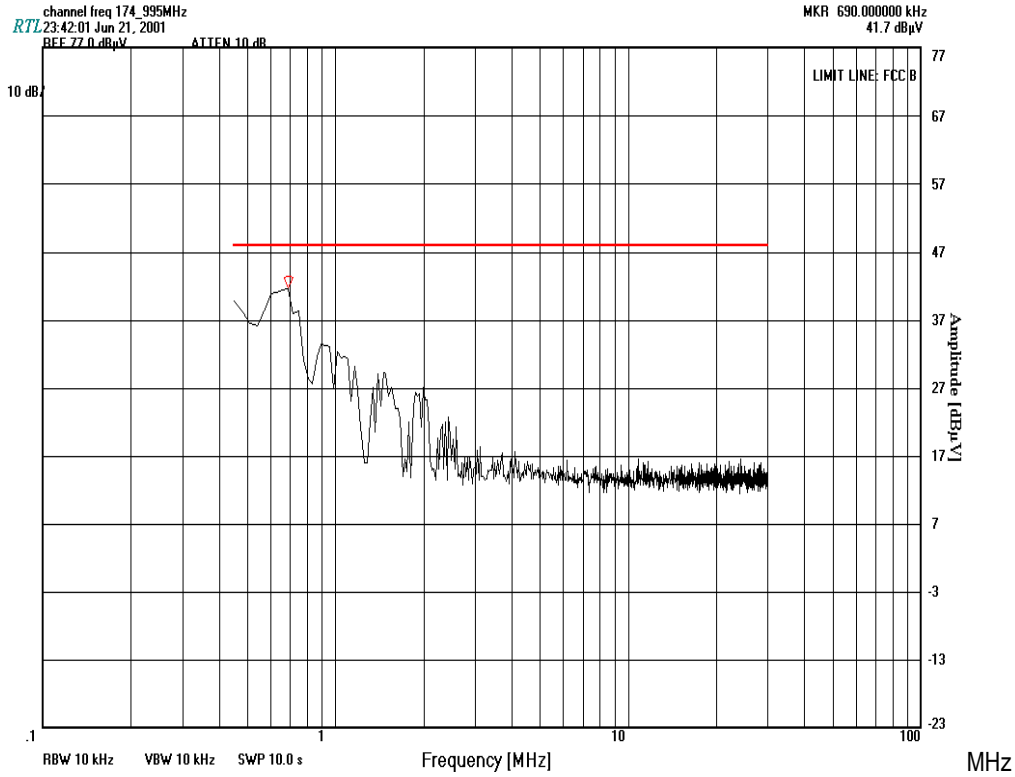
PLOT 3-3: CONDUCTED PLOT FOR CHANNEL FREQUENCY 154.995MHZ (L1)



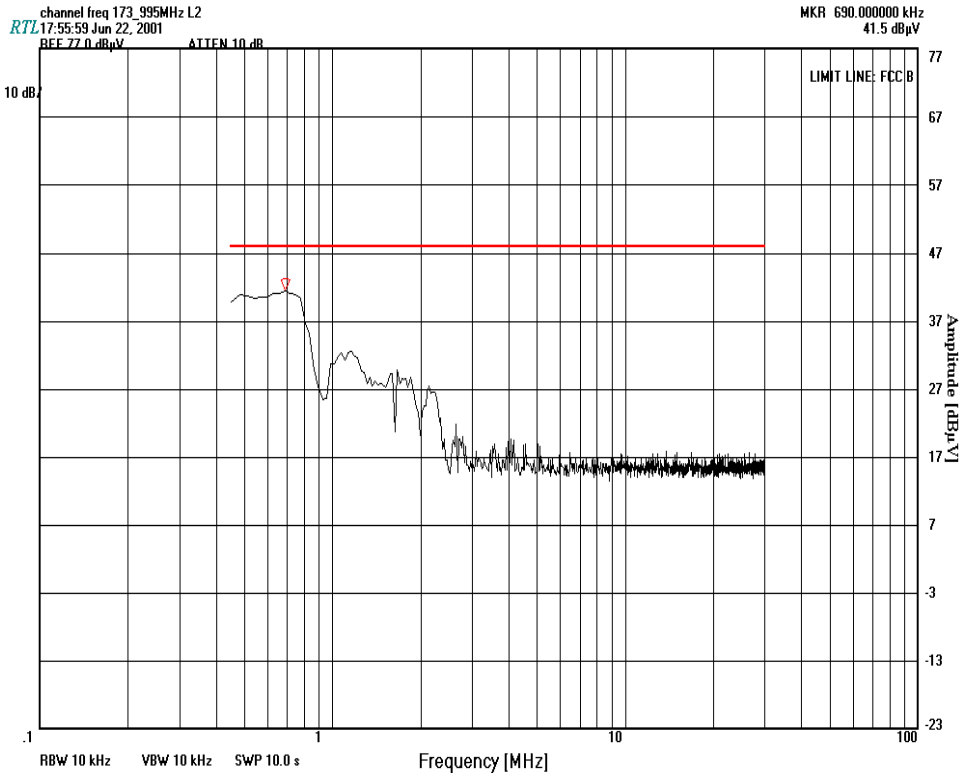
PLOT 3-4: CONDUCTED PLOT FOR CHANNEL FREQUENCY 154.995MHZ (L2)



PLOT 3-5: CONDUCTED PLOT FOR CHANNEL FREQUENCY 174.995MHZ (L1)



PLOT 3-6: CONDUCTED PLOT FOR CHANNEL FREQUENCY 174.995MHZ (L2)



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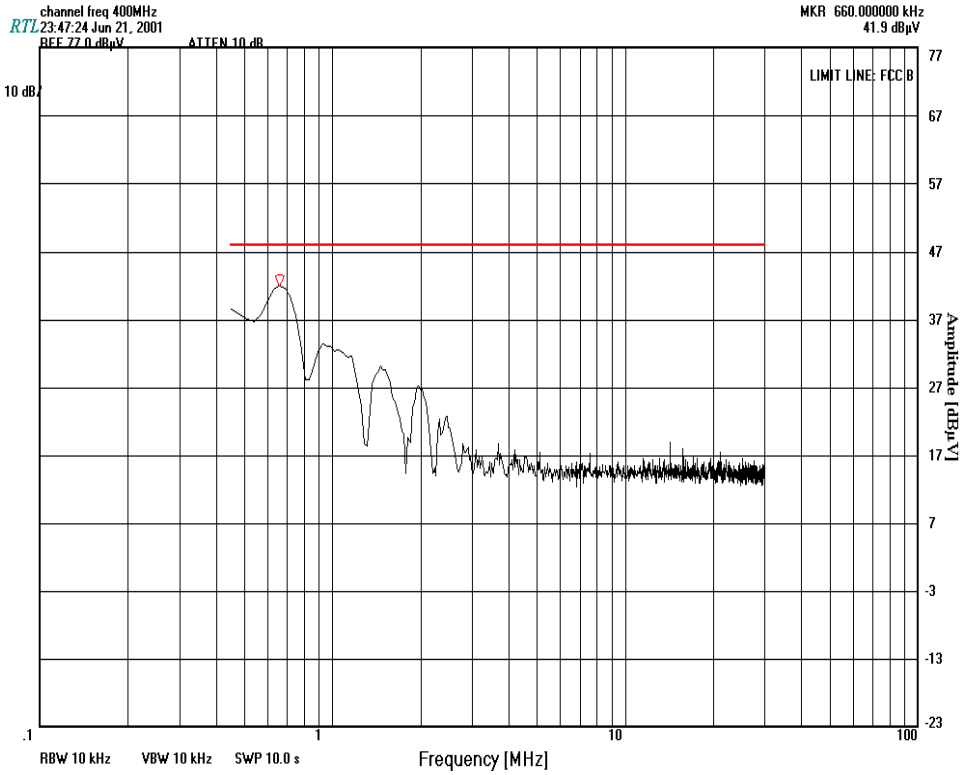
PLOT 3-7: CONDUCTED PLOT FOR CHANNEL FREQUENCY 400.000MHZ (L1)



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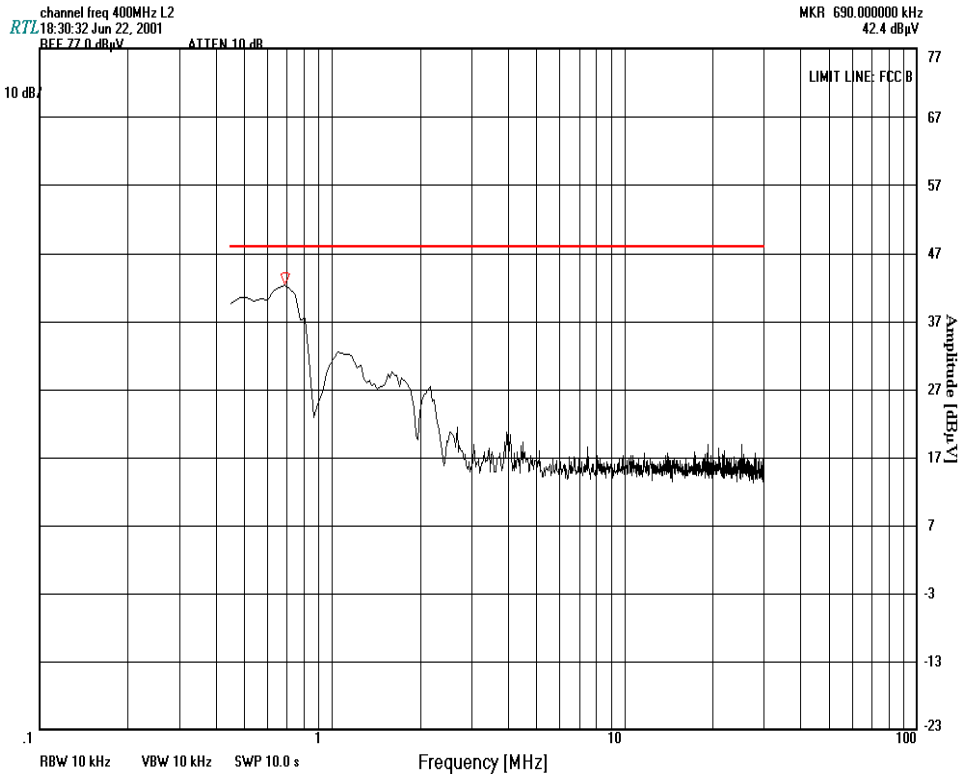
PLOT 3-8: CONDUCTED PLOT FOR CHANNEL FREQUENCY 400.000MHZ (L2)



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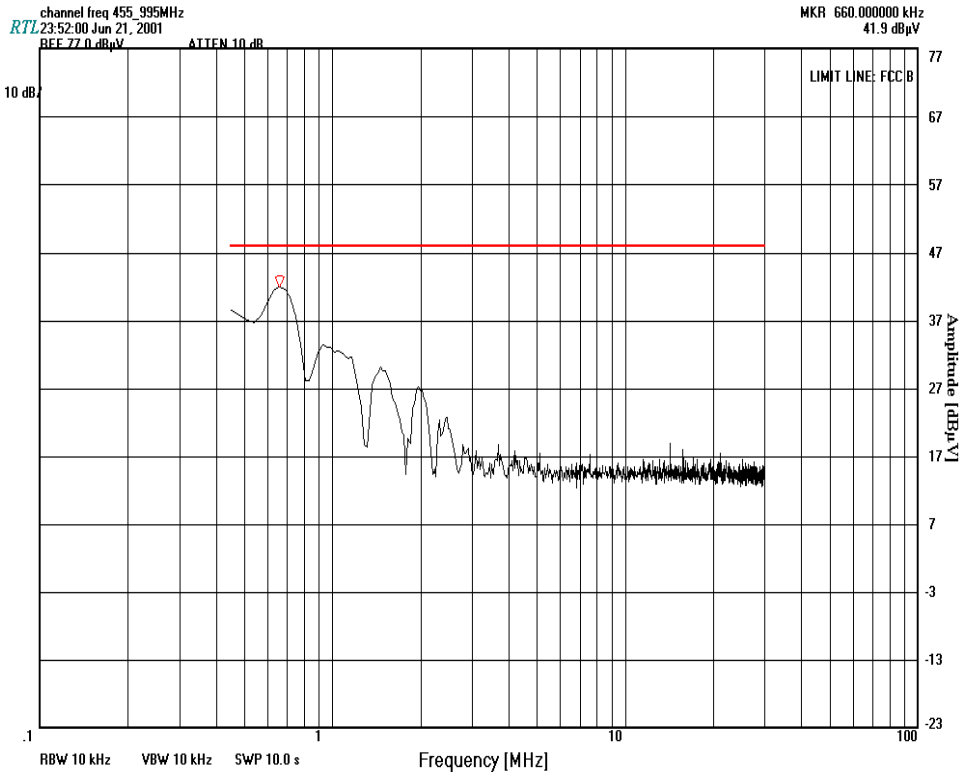
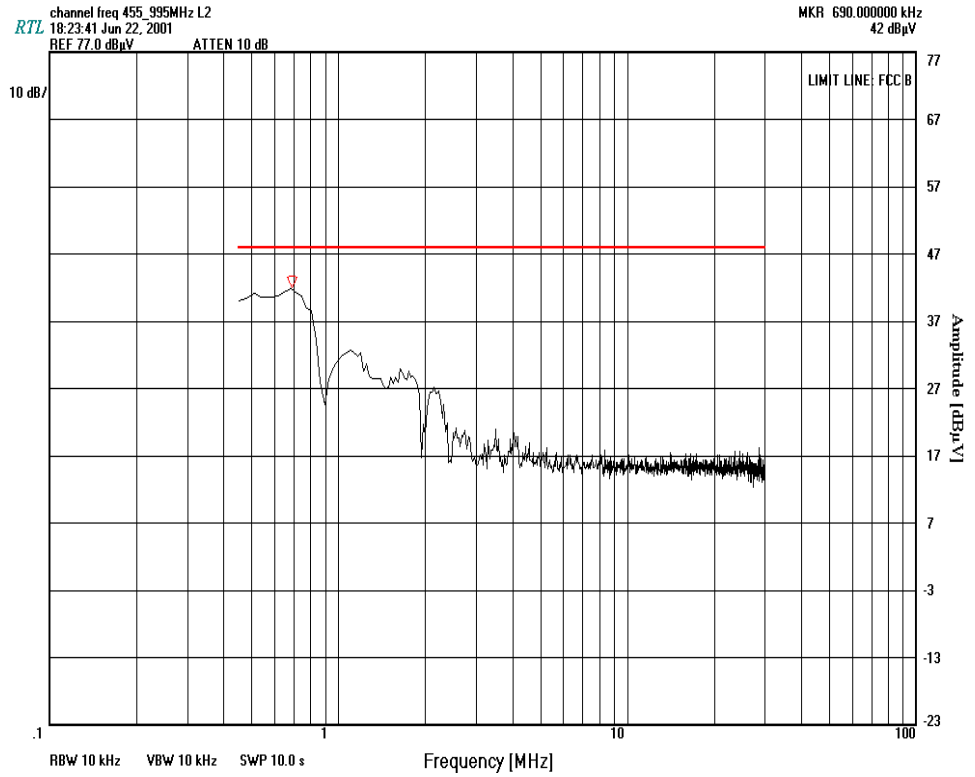
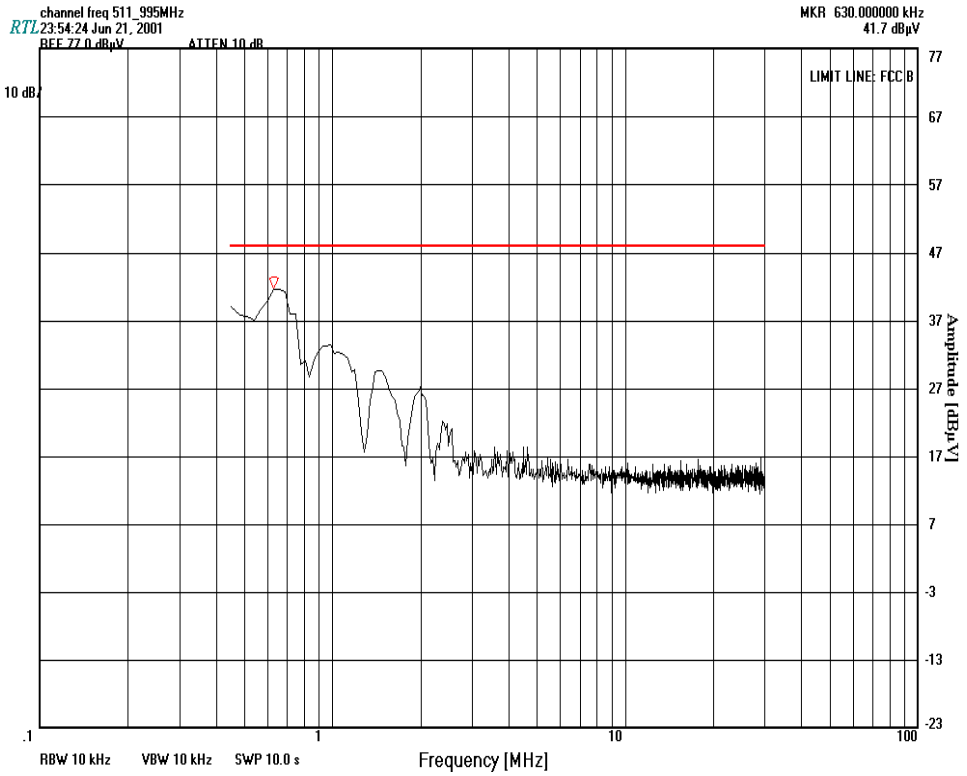
PLOT 3-9: CONDUCTED PLOT FOR CHANNEL FREQUENCY 455.995MHZ (L1)



CONDUCTED PLOT FOR CHANNEL FREQUENCY 455.995MHZ (L2)



PLOT 3-10: CONDUCTED PLOT FOR CHANNEL FREQUENCY 511.995MHZ (L1)



PLOT 3-11: CONDUCTED PLOT FOR CHANNEL FREQUENCY 511.995MHZ (L2)

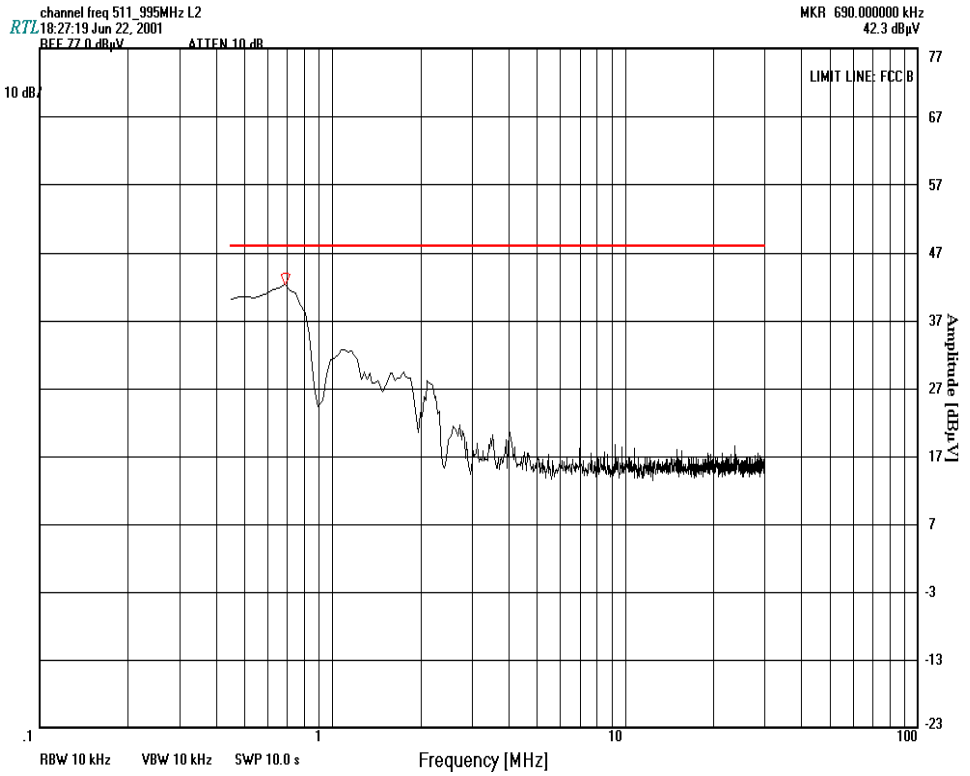


TABLE 3-5: EQUIPMENT USED FOR TESTING

Conducted Emissions					
RTL Asset #	**Manufacturer**	**Model**	**Part Type**	**Serial Number**	**Calibration Due Date**
900931	HP	8566B	Spectrum Analyzer (100 Hz - 22 GHz)	3138A07771	05/16/02
900070	Solar		LISN		

4 RADIATED EMISSIONS

4.1 TEST METHODOLOGY FOR 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. When any clock exceeds 108 MHz, the EUT was tested between 1 to 2 Gigahertz in peak mode with the resolution bandwidth set at 1 MHz as stated in ANSI C63.4. 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.

4.2 RADIATED EMISSION DATA

TABLE 4-1: RADIATED EMISSIONS: (136.000 MHZ)

Temperature: 83°F Humidity: 44%									
Emission Frequency (MHz)	Test Detector	Antenna Polarity (H/V)	Turntable Azimuth (deg)	Antenna Height (m)	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
175.148	Qp	H	180	3.0	36.8	-18.1	18.7	43.5	-24.8
298.080	Qp	V	145	1.0	30.9	-14.2	16.7	46.0	-29.3
350.298	Qp	H	145	2.8	30.5	-11.6	18.9	46.0	-27.1
434.240	Qp	V	225	1.0	30.8	-9.3	21.5	46.0	-24.5
503.098	Qp	V	145	1.0	30.8	-8.3	22.5	46.0	-23.5
525.445	Qp	H	90	2.3	26.8	-7.5	19.3	46.0	-26.7
700.593	Qp	H	145	3.0	36.0	-5.3	30.7	46.0	-15.3
875.782	Qp	H	90	3.0	30.4	-2.3	28.1	46.0	-17.9

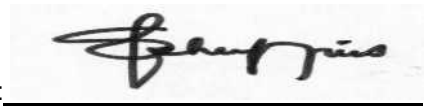
**All readings are quasi-peak, unless stated otherwise.*

TABLE 4-2: RADIATED EMISSIONS: (154.995 MHZ)

Temperature: 83°F Humidity: 44%									
Emission Frequency (MHz)	Test Detector	Antenna Polarity (H/V)	Turntable Azimuth (deg)	Antenna Height (m)	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
194.135	Qp	V	0	1.0	60.1	-18.0	42.1	43.5	-1.4
270.900	Qp	V	0	1.0	34.2	-14.7	19.5	46.0	-26.5
388.270	Qp	V	225	1.0	38.5	-11.3	27.2	46.0	-18.8
425.700	Qp	V	270	1.0	33.0	-9.2	23.8	46.0	-22.2
582.435	Qp	V	320	1.0	39.8	-6.6	33.2	46.0	-12.8
582.437	Qp	H	90	1.4	39.3	-6.4	32.9	46.0	-13.1
776.570	Qp	V	0	1.0	36.2	-4.4	31.8	46.0	-14.2

**All readings are quasi-peak, unless stated otherwise.*

TEST PERSONNEL:

Signature:  Date: June 26, 2001

Typed/Printed Name: Franck Schuppius

TABLE 4-3: RADIATED EMISSIONS: (173.995 MHZ)

Temperature: 83°F Humidity: 44%									
Emission Frequency (MHz)	Test Detector	Antenna Polarity (H/V)	Turntable Azimuth (deg)	Antenna Height (m)	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
73.600	Qp	V	225	1.0	33.8	-23.1	10.7	40.0	-29.3
167.700	Qp	V	145	1.0	32.4	-17.5	14.9	43.5	-28.6
206.080	Qp	V	0	1.0	32.1	-17.4	14.7	43.5	-28.8
213.145	Qp	V	145	1.0	58.5	-17.6	40.9	43.5	-2.6
426.288	Qp	V	180	1.0	33.7	-9.2	24.5	46.0	-21.5
639.431	Qp	V	325	1.0	34.9	-5.7	29.2	46.0	-16.8
852.610	Qp	V	90	1.0	35.3	-3.8	31.5	46.0	-14.5

**All readings are quasi-peak, unless stated otherwise.*

TABLE 4-4: RADIATED EMISSIONS: (400.000 MHZ)

Temperature: 83°F Humidity: 44%									
Emission Frequency (MHz)	Test Detector	Antenna Polarity (H/V)	Turntable Azimuth (deg)	Antenna Height (m)	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
154.560	Qp	H	225	1.0	36.3	-17.4	18.9	43.5	-24.6
245.100	Qp	H	145	1.4	37.1	-15.2	21.9	46.0	-24.1
309.600	Qp	H	225	2.0	36.8	-13.2	23.6	46.0	-22.4
360.850	Qp	V	245	1.2	52.6	-12.0	40.6	46.0	-5.4
361.200	Qp	H	145	1.0	36.7	-10.9	25.8	46.0	-20.2
425.700	Qp	H	225	1.0	34.7	-8.9	25.8	46.0	-20.2
721.705	Qp	V	180	1.3	41.0	-4.7	36.3	46.0	-9.7

**All readings are quasi-peak, unless stated otherwise.*

TEST PERSONNEL:

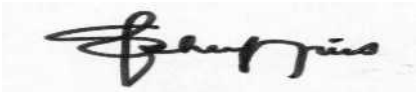
Signature:  Date: June 26, 2001

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TABLE 4-5: RADIATED EMISSIONS: (455.995 MHZ)

Temperature: 83°F Humidity: 44%									
Emission Frequency (MHz)	Test Detector	Antenna Polarity (H/V)	Turntable Azimuth (deg)	Antenna Height (m)	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
136.160	Qp	H	145	1.2	37.5	-16.4	21.1	43.5	-22.4
154.800	Qp	H	180	2.0	35.7	-17.4	18.3	43.5	-25.2
235.520	Qp	H	90	2.2	36.5	-16.2	20.3	46.0	-25.7
283.800	Qp	H	270	2.2	35.6	-13.8	21.8	46.0	-24.2
416.845	Qp	V	90	1.2	50.3	-9.4	40.9	46.0	-5.1
833.690	Qp	V	145	1.0	41.8	-4.1	37.7	46.0	-8.3

**All readings are quasi-peak, unless stated otherwise.*

TABLE 4-6: RADIATED EMISSIONS: (511.995 MHZ)

Temperature: 83°F Humidity: 44%									
Emission Frequency (MHz)	Test Detector	Antenna Polarity (H/V)	Turntable Azimuth (deg)	Antenna Height (m)	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
73.600	Qp	H	0	1.6	37.0	-22.5	14.5	40.0	-25.5
180.600	Qp	H	270	2.0	35.1	-18.3	16.8	43.5	-26.7
283.800	Qp	H	245	3.0	35.9	-13.8	22.1	46.0	-23.9
375.360	Qp	V	145	1.0	33.8	-11.3	22.5	46.0	-23.5
472.842	Qp	V	45	1.0	53.5	-8.9	44.6	46.0	-1.4
945.684	Qp	V	145	1.0	45.7	-4.1	41.6	46.0	-4.4

**All readings are quasi-peak, unless stated otherwise.*

TEST PERSONNEL:

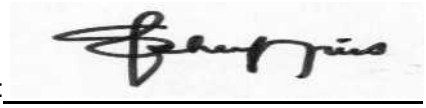
Signature:  Date: June 26, 2001

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TABLE 4-7: EQUIPMENT USED FOR TESTING

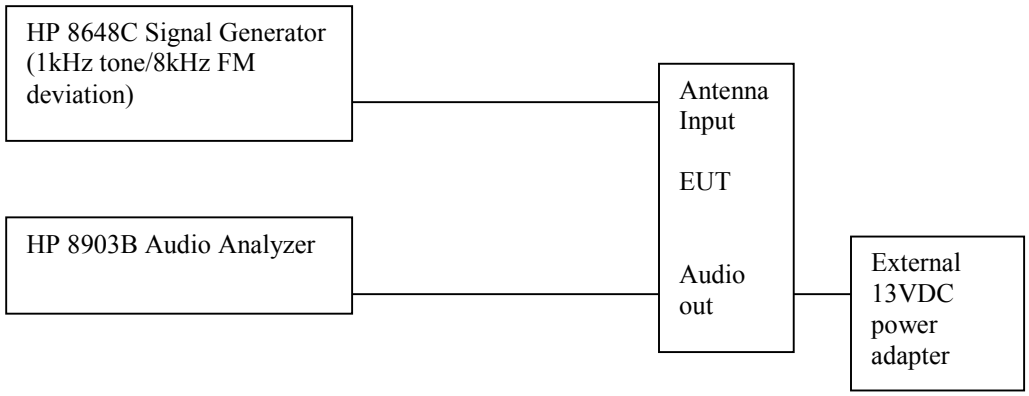
Radiated Emissions					
RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900931	HP	8566B	Spectrum Analyzer (100Hz – 22 GHz)	3138A07771	03/27/02
900999	HP	8596EM Analyzer	Spectrum Analyzer (9KHz - 12.5GHz)	3826A00144	03/25/02
901053	Schaffner@Chase	CBL6112B	Bilog antenna (20 MHz - 2 GHz)	2648	05/24/02
900321	EMCO	3161-03	Horn Antennas (4-8,2GHz)	9508-1020	N/A
900323	EMCO	3161-03	Horn Antennas (4-8,2GHz)	9508-1020	N/A
900772	Electro Metrics	RGA 60	Horn Antenna	2310	03/25/02
900889	HP	85685A	RF Preselector for HP 8566B or 8568B (20Hz-2GHz)	3146A01309	11/08/01
900800	EMCO	3301B	Active monopole antenna (30 Hz – 50 MHz)	9809-4071	05/02/02

5 38DB REJECTION TEST

A signal generator was connected to the receiver under test, and the output of the receiver was connected to an audio analyzer.

A FM signal was applied to the receiver antenna input with a 1kHz tone modulated at 8 kHz deviation, and adjusted with the audio analyzer to produce a 12 dB SINAD. This was done across the receiver bands to determine a reference level. The reference level used was that with the highest sensitivity in all of the bands.

The output of the signal generator was then adjusted to a level 40 dB above the reference level established and set to a low, medium and high frequency in both the mobile and base cellular bands. (Mobile = 824.04 MHz through 848.97 MHz, Base = 881.50 MHz through 893. 97 MHz). The squelch of the receiver was then set to a minimum threshold level and scanning began from the lowest to the highest channel. Whenever the receiver stopped and "un-squelched" that frequency was noted as a response. After all the frequencies of responses were noted, the signal generator was set to measure the sensitivity at each of these response frequencies. This measurement was the reference sensitivity for the particular received frequency measured. The audio analyzer measurement was used to measure the 12 dB SINAD and that is the spurious value. The difference between the reference sensitivity and the spurious value is the rejection ratio and must be at least 38 dB.



Frequencies used on the Signal Generator were 824.04, 836.50, 848.97 MHz for the Mobile and 881.50, 869.04, 893.97 MHz for the Base.

The DJ-X2000T unit reference level used was –50 dBm from the signal generator, this was determined from the highest sensitivity from 930 MHz at –90.0 dBm measurement of 12dB SINAD. The DJ-X2000T unit was scanned from 30 - 960 MHz for all channels (manufacturers spec.). Signals that were noted as responses were checked with the signal generator off and if they still existed as a response were determined as ambient signals and removed from the response list. There was one signal available for the 38 dB rejection test requirements.

5.1 38DB REJECTION TEST DATA FOR CELLULAR BAND (869.040-893.970 MHZ)

TABLE 5-1: 38DB REJECTION {FREQUENCY INJECTED: 869.040 MHZ} (CELLULAR BAND)

Frequency Injected: 869.040 MHz		Temperature: 74°F; Humidity: 33%		
Frequency Detected (MHz)	**Level 12dB SINAD at 869.040 MHz**	**Level 12dB at frequency detected**	**Rejection**	**Margin**
No Frequencies Detected	N/A	N/A	N/A	N/A

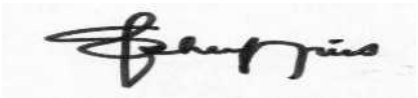
TABLE 5-2: 38DB REJECTION {FREQUENCY INJECTED: 881.500 MHZ} (CELLULAR BAND)

Frequency Injected: 881.500 MHz		Temperature: 74°F; Humidity: 33%		
Frequency Detected (MHz)	**Level 12dB SINAD at 881.50MHz**	**Level 12dB at frequency detected**	**Rejection**	**Margin**
No Frequencies Detected	N/A	N/A	N/A	N/A

TABLE 5-3: 38DB REJECTION {FREQUENCY INJECTED: 93.970 MHZ} (CELLULAR BAND)

Frequency Injected: 893.970 MHz		Temperature: 74°F; Humidity: 33%		
Frequency Detected (MHz)	**Level 12dB SINAD at 893.970MHz**	**Level 12dB at frequency detected**	**Rejection**	**Margin**
No Frequencies Detected	N/A	N/A	N/A	N/A

TEST PERSONNEL:

Signature:  Date: June 26, 2001

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5.2 38DB REJECTION TEST DATA FOR MOBILE BAND (824.040 – 848.970 MHZ)

TABLE 5-4: 38DB REJECTION {FREQUENCY INJECTED: 824.040 MHZ} (MOBILE BAND)

Frequency Injected: 824.040 MHz		Temperature: 74°F; Humidity: 33%		
Frequency Detected (MHz)	Level 12dB SINAD at 824.040MHz	Level 12dB at frequency detected	Rejection	Margin
No Frequencies Detected	N/A	N/A	N/A	N/A

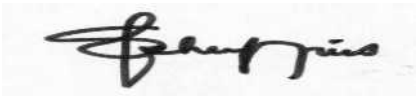
TABLE 5-5: 38DB REJECTION {FREQUENCY INJECTED: 836.500 MHZ} (MOBILE BAND)

Frequency Injected: 836.500 MHz		Temperature: 74°F; Humidity: 33%		
Frequency Detected (MHz)	Level 12dB SINAD at 836.500MHz	Level 12dB at frequency detected	Rejection	Margin
No Frequencies Detected	N/A	N/A	N/A	N/A

TABLE 5-6: 38DB REJECTION {FREQUENCY INJECTED: 848.970 MHZ} (MOBILE BAND)

Frequency Injected: 848.970 MHz		Temperature: 74°F; Humidity: 33%		
Frequency Detected (MHz)	Level 12dB SINAD at 848.970MHz	Level 12dB at frequency detected	Rejection	Margin
No Frequencies Detected	N/A	N/A	N/A	N/A

TEST PERSONNEL:

Signature:  Date: June 26, 2001

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