

### 1.3 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

DESCRIPTION	MANUFACTURER	MODEL	SERIAL NO	FCC ID	CABLE DESCRIPTIONS	RTL BAR CODE
BATTERY CHARGER (EUT)	ALINCO	N/A	EDC-63	N/A	UNSHIELDED I/O	09006
WIDE BAND RECEIVER (EUT)	ALINCO	DJ-X10T	T000999	EUG5U5 DJ-X10T	UNSHIELDED I/O; SHIELDED I/O; UNSHIELDED POWER	09005
SIGNAL GENERATOR	HEWLETT PACKARD	9660C	1947A02956	N/A	SHIELDED I/O; UNSHIELDED POWER	90059
12VDC BATTERY	POWER SONIC CORPORATION	N/A	N/A	N/A	UNSHIELDED POWER	N/A

## **1.5 TEST METHODOLOGY**

Both conducted and radiated testing were 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).

### 3.0 SYSTEM TEST CONFIGURATION

The EUT was configured for testing by connecting a monopole test antenna a signal generator. The signal generator provided an indirect coupling of the transceivers input signal. One lower, middle and upper frequency within the band listed below were entered on the signal generator with the RF amplitude output set at -60dBm. The audio input port of EUT was connected to a microphone. A 12V DC battery and cord was connected to the DC power jack. The EUT was set in the AC charging unit during the test. The serial service port was not used during testing as this port is for servicing the EUT only. An auxiliary port next to the audio port was not used during testing as this is a manufacturer service port.

**TABLE 1: CHANNEL FREQUENCY**

<i>RECEIVER BANDS</i>	<i>FREQUENCY (MHz)</i>
30MHz to 108MHz	Lower 30 Middle 69 Upper 108
108MHz to 170MHz	Lower 109 Middle 139 Upper 170
170MHz to 222MHz	Lower 171 Middle 196 Upper 222
222MHz to 470MHz	Lower 233 Middle 346 Upper 470
470MHz to 797MHz	Lower 471 Middle 663 Upper 797
797MHz to 960MHz	Lower 798 Middle 895 Upper 960

### 3.1 JUSTIFICATION

The EUT was tested as a scanning receiver per FCC rules and regulations. The FCC does not regulate the transmitter section of the Transceiver, since it is an Amateur transceiver and its operating frequency falls under the amateur band.

### 3.2 EXERCISING THE EUT

During testing the EUT and the generator were tuned to each of the frequencies listed below and the output level of the signal generator was set to allow for maximum signal strength reception on the EUT (from -60dBm to -70dBm depending on the tuned frequency under test). The frequency was entered by the keypad on the Transceiver. When the Transceiver was locked on to a signal radiating from the generator and its test antenna a busy sign was displayed on the Transceiver's LCD display. The EUT was configured for testing to represent a worst case scenario. The receiver was placed in the charger unit for final testing. The channels representing each of the six bands that were scanned are as follows (MHz): 30, 69, 108, 109, 139, 170, 171, 196, 222, 223, 346, 470, 471, 663, 797, 798, 895 and 960.

### 3.3 SPECIAL ACCESSORIES

All interface cables used for compliance testing are unshielded.. ALINCO, Inc. provided the DC port cable with ferrite, and AC charging cradle.

### 3.4 MODE OF OPERATION

The EUT was investigated in the following modes:

1. Locked frequency mode in which the EUT was locked on to each channel.
2. Powered on mode in which the emissions were observed while the unit was powering on.
3. Charging mode in which the unit was charging, and scanning mode in which the unit was actively scanning.

Worst case emissions are presented with the EUT locked on to each channel frequency tested.


### PRESCANNING

During pre-scanning in the shielded room for radiated and conducted data, the fundamentals and harmonics of the following crystal or oscillators were investigated and tested: CPU 3.6864 MHz, RTC 32.768 kHz, RF-UNIT 12.8 MHz, LO 230.4 MHz, LO 691.2 MHz, LO 34.35 MHz, LO 44.595 MHz, First IF signals 736.25, and 275.45 MHz, second IF signal 45.05 MHz, third IF 10.7 MHz, and 455KHz, 10 MHz reference oscillator and any broadband noise.

### 3.5 CONFORMANCE STATEMENT

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. No modifications were made during testing to the equipment in order to achieve compliance with these standards.

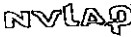
Furthermore, there was no deviation from, additions to or exclusions from the ANSI C63.4 test methodology.

Signature: 

Date: April 15, 1998

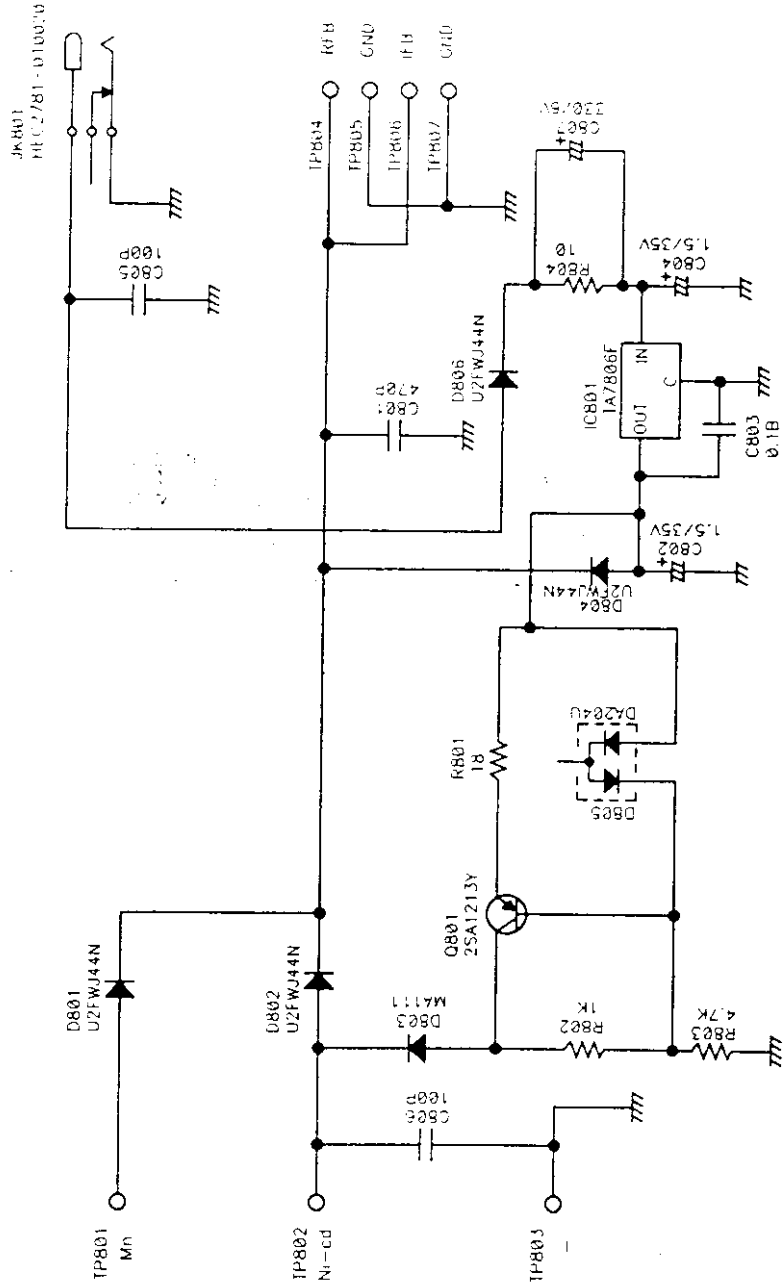
Typed/Printed Name: Desmond A. Fraser

Position: Quality Manager  
(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.**

# CHARGE Unit



## 5.0 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 average limit with the instrument set to the quasi-peak mode, then measurements are made in the average mode.

The conducted test was performed with the EUT exercise program loaded, and the emissions were scanned between 150 kHz to 30 MHz on the NEUTRAL SIDE and HOT SIDE, herein referred to as L1 and L2, respectively.

**TABLE 2: CONDUCTED EMISSIONS: 30 MHZ**

### NEUTRAL SIDE (Line 1)

EMISSION FREQUENCY (MHz)	TEST DETECTOR (1)	ANALYZER READING (dBuV)	SITE CORRECTION FACTOR (dB)	EMISSION LEVEL (dBuV)	AVERAGE FCC LIMIT (dBuV)	AVERAGE FCC MARGIN (dBuV)
6.470	Pk	21.2	1.8	23.0	48.0	-25.0
11.875	Pk	27.6	2.3	29.9	48.0	-18.1
12.161	Pk	30.4	2.3	32.7	48.0	-15.3
13.615	Pk	20.5	2.5	23.0	48.0	-25.0
15.564	Pk	24.8	2.9	27.7	48.0	-20.3
21.846	Pk	21.5	2.8	24.3	48.0	-23.7
23.983	Pk	21.5	3.7	25.2	48.0	-22.8

### HOT SIDE (Line 2)

6.437	Pk	22.6	1.7	24.3	48.0	-23.7
11.875	Pk	23.6	2.1	25.7	48.0	-22.3
12.160	Pk	27.9	2.1	30.0	48.0	-18.0
13.615	Pk	22.5	2.4	24.9	48.0	-23.1
17.760	Pk	27.6	3.4	31.0	48.0	-17.0
21.999	Pk	21.6	2.8	24.4	48.0	-23.6
23.000	Pk	19.8	3.1	22.9	48.0	-25.1

<sup>(1)</sup>Pk = Peak; QP = Quasi-Peak; Av = Average

### TEST PERSONNEL:

Signature: \_\_\_\_\_



Date: 4/9/98

Typed/Printed Name: K. Franck Schuppis

**TABLE 3: CONDUCTED EMISSIONS: 69 MHz**

NEUTRAL SIDE (Line 1)

EMISSION FREQUENCY (MHz)	TEST DETECTOR (1)	ANALYZER READING (dBuV)	SITE CORRECTION FACTOR (dB)	EMISSION LEVEL (dBuV)	AVERAGE FCC LIMIT <sup>(1)</sup> (dBuV)	AVERAGE FCC MARGIN <sup>(1)</sup> (dBuV)
6.544	Pk	20.3	1.8	22.1	48.0	-25.9
11.945	Pk	19.8	2.3	22.1	48.0	-25.9
12.608	Pk	20.7	2.4	23.1	48.0	-24.9
22.526	Pk	24.1	3.1	27.2	48.0	-20.8
23.545	Pk	21.9	3.6	25.5	48.0	-22.5
24.576	Pk	21.9	3.6	25.5	48.0	-22.5
24.999	Pk	20.8	3.5	24.3	48.0	-23.7

HOT SIDE (Line 2)

6.476	Pk	21.8	1.8	23.6	48.0	-24.4
11.875	Pk	27.9	2.1	30.0	48.0	-18.0
11.945	Pk	22.6	2.1	24.7	48.0	-23.3
12.643	Pk	19.5	2.2	21.7	48.0	-26.3
22.003	Pk	21.2	2.8	24.0	48.0	-24.0
22.527	Pk	24.6	3.0	27.6	48.0	-20.4
23.982	Pk	22.5	3.6	26.1	48.0	-21.9

**TABLE 4: CONDUCTED EMISSIONS: 108 MHz**

NEUTRAL SIDE (Line 1)

EMISSION FREQUENCY (MHz)	TEST DETECTOR (1)	ANALYZER READING (dBuV)	SITE CORRECTION FACTOR (dB)	EMISSION LEVEL (dBuV)	AVERAGE FCC LIMIT <sup>(1)</sup> (dBuV)	AVERAGE FCC MARGIN <sup>(1)</sup> (dBuV)
0.724	Pk	24.1	0.4	24.5	48.0	-23.5
1.164	Pk	22.3	0.6	22.9	48.0	-25.1
6.268	Pk	22.4	1.8	24.2	48.0	-23.8
11.089	Pk	22.9	2.2	25.1	48.0	-22.9
19.466	Pk	22.9	3.1	26.0	48.0	-22.0
29.668	Pk	22.9	4.8	27.7	48.0	-20.3

HOT SIDE (Line 2)

0.675	Pk	23.6	0.4	24.0	48.0	-24.0
2.237	Pk	24.4	1.4	25.8	48.0	-22.2
3.338	Pk	24.2	1.4	25.6	48.0	-22.4
6.830	Pk	24.4	2.1	26.5	48.0	-21.5
17.96	Pk	22.0	3.4	25.4	48.0	-22.6
24.488	Pk	24.3	3.3	27.6	48.0	-20.4

<sup>(1)</sup>Pk = Peak; QP = Quasi-Peak; Av = Average

**TEST PERSONNEL:**

Signature: 

Date: 4/9/98

Typed/Printed Name: K. Franck Schuppilus



**TABLE 5: CONDUCTED EMISSIONS: 109 MHZ**

**NEUTRAL SIDE (Line 1)**

EMISSION FREQUENCY (MHz)	TEST DETECTOR (1)	ANALYZER READING (dBuV)	SITE CORRECTION FACTOR (dB)	EMISSION LEVEL (dBuV)	AVERAGE FCC LIMIT <sup>(1)</sup> (dBuV)	AVERAGE FCC MARGIN <sup>(1)</sup> (dBuV)
0.599	Pk	25.4	0.3	25.7	48.0	-22.3
2.704	Pk	24.8	1.1	25.9	48.0	-22.1
8.660	Pk	25.5	2.0	27.5	48.0	-20.5
12.000	Pk	23.3	2.4	25.7	48.0	-22.3
15.380	Pk	24.7	3.4	28.1	48.0	-19.9
21.540	Pk	25.6	3.2	28.8	48.0	-19.2

**HOT SIDE (Line 2)**

0.495	Pk	25.4	0.3	25.7	48.0	-22.3
0.870	Pk	24.5	0.4	24.9	48.0	-23.1
1.187	Pk	25.0	1.3	26.3	48.0	-21.7
4.823	Pk	25.0	1.8	26.8	48.0	-21.2
7.389	Pk	22.1	2.0	24.1	48.0	-23.9
13.96	Pk	25.0	2.7	27.7	48.0	-20.3

**TABLE 6: CONDUCTED EMISSIONS: 139 MHZ**

**NEUTRAL SIDE (Line 1)**

EMISSION FREQUENCY (MHz)	TEST DETECTOR (1)	ANALYZER READING (dBuV)	SITE CORRECTION FACTOR (dB)	EMISSION LEVEL (dBuV)	FCC AVERAGE LIMIT (dBuV)	FCC AVERAGE MARGIN (dBuV)
0.861	Pk	24.8	0.4	25.2	48.0	-22.8
1.208	Pk	24.9	0.6	25.5	48.0	-22.5
4.749	Pk	24.9	1.5	26.4	48.0	-21.6
9.500	Pk	25.8	2.0	27.8	48.0	-20.2
17.880	Pk	24.7	3.5	28.2	48.0	-19.8
22.490	Pk	25.8	3.1	28.9	48.0	-19.1

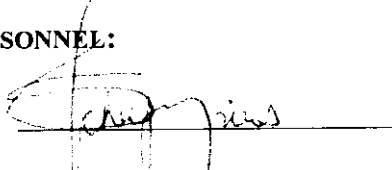
**HOT SIDE (Line 2)**

0.610	Pk	25.7	0.4	26.1	48.0	-21.9
5.000	Pk	25.4	1.9	27.3	48.0	-20.7
6.528	Pk	25.0	2.0	27.0	48.0	-21.0
10.730	Pk	25.0	2.3	27.3	48.0	-20.7
13.110	Pk	25.0	2.6	27.6	48.0	-20.4
29.270	Pk	24.9	4.3	29.2	48.0	-18.8

<sup>(1)</sup>Pk = Peak; QP = Quasi-Peak; Av = Average

**TEST PERSONNEL:**

Signature: \_\_\_\_\_



Date: 4/9/98

Typed/Printed Name: K. Franck Schuppis

**TABLE 7: CONDUCTED EMISSIONS: 170 MHZ**

**NEUTRAL SIDE (Line 1)**

EMISSION FREQUENCY (MHz)	TEST DETECTOR (1)	ANALYZER READING (dBuV)	SITE CORRECTION FACTOR (dB)	EMISSION LEVEL (dBuV)	FCC AVERAGE LIMIT (dBuV)	FCC AVERAGE MARGIN (dBuV)
0.702	Pk	25.0	0.3	25.3	48.0	-22.7
5.968	Pk	25.2	1.8	27.0	48.0	-21.0
7.988	Pk	24.8	1.9	26.7	48.0	-21.3
9.932	Pk	25.4	2.1	27.5	48.0	-20.5
14.160	Pk	25.5	3.0	28.5	48.0	-19.5
25.000	Pk	24.8	3.8	28.6	48.0	-19.4

**HOT SIDE (Line 2)**

0.780	Pk	22.2	0.4	22.6	48.0	-25.4
1.140	Pk	22.2	1.3	23.5	48.0	-24.5
5.398	Pk	22.4	1.9	24.3	48.0	-23.7
11.289	Pk	24.7	2.3	27.0	48.0	-21.0
15.021	Pk	24.7	2.9	27.6	48.0	-20.4
29.219	Pk	24.5	4.2	28.7	48.0	-19.3

**TABLE 8: CONDUCTED EMISSIONS: 171 MHZ**

**NEUTRAL SIDE (Line 1)**

EMISSION FREQUENCY (MHz)	TEST DETECTOR (1)	ANALYZER READING (dBuV)	SITE CORRECTION FACTOR (dB)	EMISSION LEVEL (dBuV)	FCC AVERAGE LIMIT (dBuV)	FCC AVERAGE MARGIN (dBuV)
0.524	Pk	25.5	0.3	25.8	48.0	-22.2
1.115	Pk	24.1	0.6	24.7	48.0	-23.3
6.808	Pk	23.1	1.8	24.9	48.0	-23.1
11.475	Pk	23.8	2.3	26.1	48.0	-21.9
18.743	Pk	23.4	3.2	26.6	48.0	-21.4
26.138	Pk	23.4	4.0	27.4	48.0	-20.6

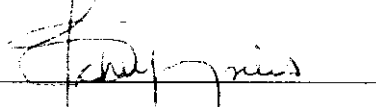
**HOT SIDE (Line 2)**

0.516	Pk	30.0	0.3	30.3	48.0	-17.7
0.726	Pk	24.2	0.4	24.6	48.0	-23.4
2.612	Pk	23.3	1.4	24.7	48.0	-23.3
3.070	Pk	23.3	1.4	24.7	48.0	-23.3
18.592	Pk	23.6	3.3	26.9	48.0	-21.1
22.000	Pk	23.8	3.7	27.5	48.0	-20.5

<sup>(1)</sup>Pk = Peak; QP = Quasi-Peak; Av = Average

**TEST PERSONNEL:**

Signature: \_\_\_\_\_



Date: 4/10/98

Typed/Printed Name: K. Franck Schuppis

**TABLE 9: CONDUCTED EMISSIONS: 196 MHZ**

NEUTRAL SIDE (Line 1)

EMISSION FREQUENCY (MHz)	TEST DETECTOR (1)	ANALYZER READING (dBuV)	SITE CORRECTION FACTOR (dB)	EMISSION LEVEL (dBuV)	AVERAGE FCC LIMIT <sup>(1)</sup> (dBuV)	AVERAGE FCC MARGIN <sup>(1)</sup> (dBuV)
1.230	Pk	25.2	0.6	25.8	48.0	-22.2
1.387	Pk	29.8	0.6	30.4	48.0	-17.6
12.341	Pk	23.0	2.3	25.3	48.0	-22.7
15.222	Pk	22.3	2.8	25.1	48.0	-22.9
20.000	Pk	23.7	2.9	26.6	48.0	-21.4
21.402	Pk	35.3	2.7	38.0	48.0	-10.0
27.156	Pk	30.2	4.6	34.8	48.0	-13.2
29.842	Pk	28.8	4.4	33.2	48.0	-14.8

HOT SIDE (Line 2)

1.233	Pk	23.4	0.6	24.0	48.0	-24.0
1.388	Pk	27.7	0.7	28.4	48.0	-19.6
12.343	Pk	21.8	2.2	24.0	48.0	-24.0
19.545	Pk	24.5	3.5	28.0	48.0	-20.0
21.402	Pk	35.6	3.0	38.6	48.0	-9.4
27.156	Pk	31.4	3.7	35.1	48.0	-12.9
29.550	Pk	31.0	4.8	35.8	48.0	-12.2

**TABLE 10: CONDUCTED EMISSIONS: 222 MHZ**

NEUTRAL SIDE (Line 1)

EMISSION FREQUENCY (MHz)	TEST DETECTOR (1)	ANALYZER READING (dBuV)	SITE CORRECTION FACTOR (dB)	EMISSION LEVEL (dBuV)	FCC AVERAGE LIMIT (dBuV)	FCC AVERAGE MARGIN (dBuV)
0.725	Pk	27.8	0.4	28.2	48.0	-19.8
1.171	Pk	27.9	0.6	28.5	48.0	-19.5
2.394	Pk	28.8	1.0	29.8	48.0	-18.2
5.914	Pk	29.1	1.8	30.9	48.0	-17.1
11.282	Pk	27.7	2.3	30.0	48.0	-18.0
20.866	Pk	28.2	3.3	31.5	48.0	-16.5

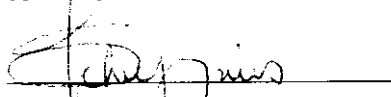
HOT SIDE (Line 2)

0.725	Pk	28.5	0.4	28.9	48.0	-19.1
1.380	Pk	28.3	1.3	29.6	48.0	-18.4
3.863	Pk	27.9	1.5	29.4	48.0	-18.6
7.460	Pk	28.5	2.0	30.5	48.0	-17.5
12.212	Pk	28.1	2.3	30.4	48.0	-17.6
27.211	Pk	28.1	3.7	31.8	48.0	-16.2

<sup>(1)</sup>Pk = Peak; QP = Quasi-Peak; Av = Average

**TEST PERSONNEL:**

Signature: \_\_\_\_\_



Date: 4/10/98

Typed/Printed Name: K. Franck Schuppis

**TABLE 11: CONDUCTED EMISSIONS: 346 MHZ**

**NEUTRAL SIDE (Line 1)**

EMISSION FREQUENCY (MHz)	TEST DETECTOR (1)	ANALYZER READING (dBuV)	SITE CORRECTION FACTOR (dB)	EMISSION LEVEL (dBuV)	AVERAGE FCC LIMIT <sup>(1)</sup> (dBuV)	AVERAGE FCC MARGIN <sup>(1)</sup> (dBuV)
1.232	Pk	24.3	0.6	24.9	48.0	-23.1
1.383	Pk	27.9	0.6	28.5	48.0	-19.5
12.344	Pk	23.7	2.3	26.0	48.0	-22.0
19.544	Pk	23.4	3.1	26.5	48.0	-21.5
21.845	Pk	24.0	2.8	26.8	48.0	-21.2
22.003	Pk	24.0	2.8	26.8	48.0	-21.2
27.156	Pk	30.7	4.6	35.3	48.0	-12.7
29.554	Pk	29.8	4.7	34.5	48.0	-13.5

**HOT SIDE (Line 2)**

1.231	Pk	24.4	0.6	25.0	48.0	-23.0
1.385	Pk	26.0	0.6	26.6	48.0	-21.4
12.344	Pk	22.9	2.2	25.1	48.0	-22.9
19.538	Pk	24.2	3.5	27.7	48.0	-20.3
25.237	Pk	25.3	3.4	28.7	48.0	-19.3
27.158	Pk	31.7	3.7	35.4	48.0	-12.6
29.546	Pk	29.9	4.8	34.7	48.0	-13.3

**TABLE 12: CONDUCTED EMISSIONS: 470 MHZ**

**NEUTRAL SIDE (Line 1)**

EMISSION FREQUENCY (MHz)	TEST DETECTOR (1)	ANALYZER READING (dBuV)	SITE CORRECTION FACTOR (dB)	EMISSION LEVEL (dBuV)	AVERAGE FCC LIMIT (dBuV)	AVERAGE FCC MARGIN (dBuV)
1.229	Pk	24.7	0.6	25.3	48.0	-22.7
1.385	Pk	28.9	0.6	29.5	48.0	-18.5
12.342	Pk	23.0	2.3	25.3	48.0	-22.7
19.542	Pk	23.3	3.1	26.4	48.0	-21.6
25.861	Pk	24.1	3.6	27.7	48.0	-20.3
27.157	Pk	30.9	4.6	35.5	48.0	-12.5
29.707	Pk	29.8	4.5	34.3	48.0	-13.7

**HOT SIDE (Line 2)**

1.233	Pk	22.4	0.6	23.0	48.0	-25.0
1.388	Pk	26.6	0.7	27.3	48.0	-20.7
11.873	Pk	21.1	2.1	23.2	48.0	-24.8
12.342	Pk	23.3	2.2	25.5	48.0	-22.5
19.540	Pk	24.3	3.5	27.8	48.0	-20.2
22.002	Pk	24.8	2.8	27.6	48.0	-20.4
27.154	Pk	31.5	3.7	35.2	48.0	-12.8
29.554	Pk	29.7	4.8	34.5	48.0	-13.5

<sup>(1)</sup>Pk = Peak; QP = Quasi-Peak; Av = Average

**TEST PERSONNEL:**

Signature: 

Date: 4/11/98

Typed/Printed Name: K. Franck Schuppis

**TABLE 13: CONDUCTED EMISSIONS: 471 MHz**

NEUTRAL SIDE (Line 1)

EMISSION FREQUENCY (MHz)	TEST DETECTOR (1)	ANALYZER READING (dBuV)	SITE CORRECTION FACTOR (dB)	EMISSION LEVEL (dBuV)	AVERAGE FCC LIMIT (dBuV)	AVERAGE FCC MARGIN (dBuV)
1.228	Pk	25.0	0.6	25.6	48.0	-22.4
1.386	Pk	28.7	0.6	29.3	48.0	-18.7
11.874	Pk	22.0	2.3	24.3	48.0	-23.7
12.344	Pk	23.0	2.3	25.3	48.0	-22.7
19.542	Pk	24.6	3.1	27.7	48.0	-20.3
27.156	Pk	30.1	4.6	34.7	48.0	-13.3
29.550	Pk	33.1	4.7	37.8	48.0	-10.2

HOT SIDE (Line 2)

1.231	Pk	23.0	0.6	23.6	48.0	-24.4
1.382	Pk	26.5	0.6	27.1	48.0	-20.9
12.344	Pk	23.7	2.2	25.9	48.0	-22.1
19.547	Pk	24.3	3.5	27.8	48.0	-20.2
25.239	Pk	25.4	3.4	28.8	48.0	-19.2
27.157	Pk	29.3	3.7	33.0	48.0	-15.0
29.548	Pk	30.8	4.8	35.6	48.0	-12.4

**TABLE 14: CONDUCTED EMISSIONS: 663 MHz**

NEUTRAL SIDE (Line 1)

EMISSION FREQUENCY (MHz)	TEST DETECTOR (1)	ANALYZER READING (dBuV)	SITE CORRECTION FACTOR (dB)	EMISSION LEVEL (dBuV)	AVERAGE FCC LIMIT (dBuV)	AVERAGE FCC MARGIN (dBuV)
1.229	Pk	24.7	0.6	25.3	48.0	-22.7
1.388	Pk	28.3	0.7	29.0	48.0	-19.0
11.878	Pk	22.9	2.3	25.2	48.0	-22.8
12.344	Pk	22.9	2.3	25.2	48.0	-22.8
19.535	Pk	23.1	3.1	26.2	48.0	-21.8
21.405	Pk	34.6	2.7	37.3	48.0	-10.7
22.002	Pk	25.5	2.8	28.3	48.0	-19.7
27.157	Pk	30.7	4.6	35.3	48.0	-12.7
29.697	Pk	31.4	4.5	35.9	48.0	-12.1

HOT SIDE (Line 2)

1.229	Pk	23.8	0.6	24.4	48.0	-23.6
1.387	Pk	27.7	0.6	28.3	48.0	-19.7
12.344	Pk	25.0	2.2	27.2	48.0	-20.8
19.390	Pk	25.8	3.5	29.3	48.0	-18.7
21.405	Pk	37.6	3.0	40.6	48.0	-7.4
22.000	Pk	26.1	2.8	28.9	48.0	-19.1
27.155	Pk	31.2	3.7	34.9	48.0	-13.1
29.550	Pk	31.3	4.8	36.1	48.0	-11.9

<sup>(1)</sup>Pk = Peak; QP = Quasi-Peak; Av = Average

**TEST PERSONNEL:**

Signature: 

Date: 4/11/98

Typed/Printed Name: K. Franck Schuppious

**TABLE 15: CONDUCTED EMISSIONS: 797 MHZ**

NEUTRAL SIDE (Line 1)

EMISSION FREQUENCY (MHz)	TEST DETECTOR (1)	ANALYZER READING (dBuV)	SITE CORRECTION FACTOR (dB)	EMISSION LEVEL (dBuV)	AVERAGE FCC LIMIT (dBuV)	AVERAGE FCC MARGIN (dBuV)
1.230	Pk	25.8	0.6	26.4	48.0	-21.6
1.386	Pk	30.1	0.6	30.7	48.0	-17.3
11.944	Pk	23.4	2.3	25.7	48.0	-22.3
12.345	Pk	25.7	2.3	28.0	48.0	-20.0
19.541	Pk	25.3	3.1	28.4	48.0	-19.6
21.999	Pk	24.5	2.8	27.3	48.0	-20.7
25.390	Pk	24.8	3.5	28.3	48.0	-19.7
27.155	Pk	30.8	4.6	35.4	48.0	-12.6
29.547	Pk	31.3	4.7	36.0	48.0	-12.0

HOT SIDE (Line 2)

1.232	Pk	24.6	0.6	25.2	48.0	-22.8
1.383	Pk	26.8	0.6	27.4	48.0	-20.6
12.344	Pk	25.5	2.2	27.7	48.0	-20.3
19.539	Pk	26.2	3.5	29.7	48.0	-18.3
21.997	Pk	26.1	2.8	28.9	48.0	-19.1
27.155	Pk	31.8	3.7	35.5	48.0	-12.5
29.547	Pk	31.9	4.8	36.7	48.0	-11.3

**TABLE 16: CONDUCTED EMISSIONS: 798 MHZ**

NEUTRAL SIDE (Line 1)

EMISSION FREQUENCY (MHz)	TEST DETECTOR (1)	ANALYZER READING (dBuV)	SITE CORRECTION FACTOR (dB)	EMISSION LEVEL (dBuV)	AVERAGE FCC LIMIT (dBuV)	AVERAGE FCC MARGIN (dBuV)
1.230	Pk	26.0	0.6	26.6	48.0	-21.4
1.384	Pk	30.0	0.6	30.6	48.0	-17.4
12.344	Pk	25.3	2.3	27.6	48.0	-20.4
19.387	Pk	25.0	3.2	28.2	48.0	-19.8
22.000	Pk	26.0	2.8	28.8	48.0	-19.2
25.238	Pk	25.1	3.5	28.6	48.0	-19.4
27.155	Pk	30.6	4.6	35.2	48.0	-12.8
29.554	Pk	31.4	4.7	36.1	48.0	-11.9

HOT SIDE (Line 2)

1.231	Pk	24.0	0.6	24.6	48.0	-23.4
1.390	Pk	27.2	0.7	27.9	48.0	-20.1
11.874	Pk	24.4	2.1	26.5	48.0	-21.5
12.342	Pk	25.1	2.2	27.3	48.0	-20.7
19.542	Pk	26.8	3.5	30.3	48.0	-17.7
20.001	Pk	25.2	3.3	28.5	48.0	-19.5
21.846	Pk	24.8	2.8	27.6	48.0	-20.4
22.003	Pk	26.5	2.8	29.3	48.0	-18.7
27.155	Pk	32.1	3.7	35.8	48.0	-12.2
29.547	Pk	32.0	4.8	36.8	48.0	-11.2

<sup>(1)</sup>Pk = Peak; QP = Quasi-Peak; Av = Average

**TEST PERSONNEL:**

Signature: 

Date: 4/10/98

Typed/Printed Name: K. Franck Schuppious

**TABLE 17: CONDUCTED EMISSIONS: 895 MHz**

**NEUTRAL SIDE (Line 1)**

EMISSION FREQUENCY (MHz)	TEST DETECTOR (1)	ANALYZER READING (dBuV)	SITE CORRECTION FACTOR (dB)	EMISSION LEVEL (dBuV)	AVERAGE FCC LIMIT (dBuV)	AVERAGE FCC MARGIN (dBuV)
1.230	Pk	26.0	0.6	26.6	48.0	-21.4
1.384	Pk	30.0	0.6	30.6	48.0	-17.4
12.344	Pk	25.3	2.3	27.6	48.0	-20.4
19.387	Pk	25.0	3.2	28.2	48.0	-19.8
22.000	Pk	26.0	2.8	28.8	48.0	-19.2
25.238	Pk	25.1	3.5	28.6	48.0	-19.4
27.155	Pk	30.6	4.6	35.2	48.0	-12.8
29.554	Pk	31.4	4.7	36.1	48.0	-11.9

**HOT SIDE (Line 2)**

1.231	Pk	24.7	0.6	25.3	48.0	-22.7
1.386	Pk	28.6	0.6	29.2	48.0	-18.8
12.344	Pk	22.7	2.3	25.0	48.0	-23.0
19.752	Pk	25.5	3.0	28.5	48.0	-19.5
24.697	Pk	29.1	3.6	32.7	48.0	-15.3
27.156	Pk	33.5	4.6	38.1	48.0	-9.9
29.616	Pk	34.0	4.6	38.6	48.0	-9.4

**TABLE 18: CONDUCTED EMISSIONS: 960 MHz**

**NEUTRAL SIDE (Line 1)**

EMISSION FREQUENCY (MHz)	TEST DETECTOR (1)	ANALYZER READING (dBuV)	SITE CORRECTION FACTOR (dB)	EMISSION LEVEL (dBuV)	AVERAGE FCC LIMIT (dBuV)	AVERAGE FCC MARGIN (dBuV)
1.231	Pk	24.7	0.6	25.3	48.0	-22.7
1.385	Pk	28.1	0.6	28.7	48.0	-19.3
12.341	Pk	21.9	2.3	24.2	48.0	-23.8
19.749	Pk	27.7	3.0	30.7	48.0	-17.3
21.393	Pk	32.0	2.7	34.7	48.0	-13.3
24.679	Pk	28.4	3.6	32.0	48.0	-16.0
27.151	Pk	32.4	4.6	37.0	48.0	-11.0
29.621	Pk	31.6	4.6	36.2	48.0	-11.8

**HOT SIDE (Line 2)**

1.230	Pk	23.7	0.6	24.3	48.0	-23.7
1.385	Pk	26.5	0.6	27.1	48.0	-20.9
12.343	Pk	23.0	2.2	25.2	48.0	-22.8
19.751	Pk	28.6	3.4	32.0	48.0	-16.0
21.393	Pk	35.8	3.0	38.8	48.0	-9.2
24.674	Pk	27.2	3.5	30.7	48.0	-17.3
27.158	Pk	35.2	3.7	38.9	48.0	-9.1
29.634	Pk	33.8	4.8	38.6	48.0	-9.4

<sup>(1)</sup>Pk = Peak; QP = Quasi-Peak; Av = Average

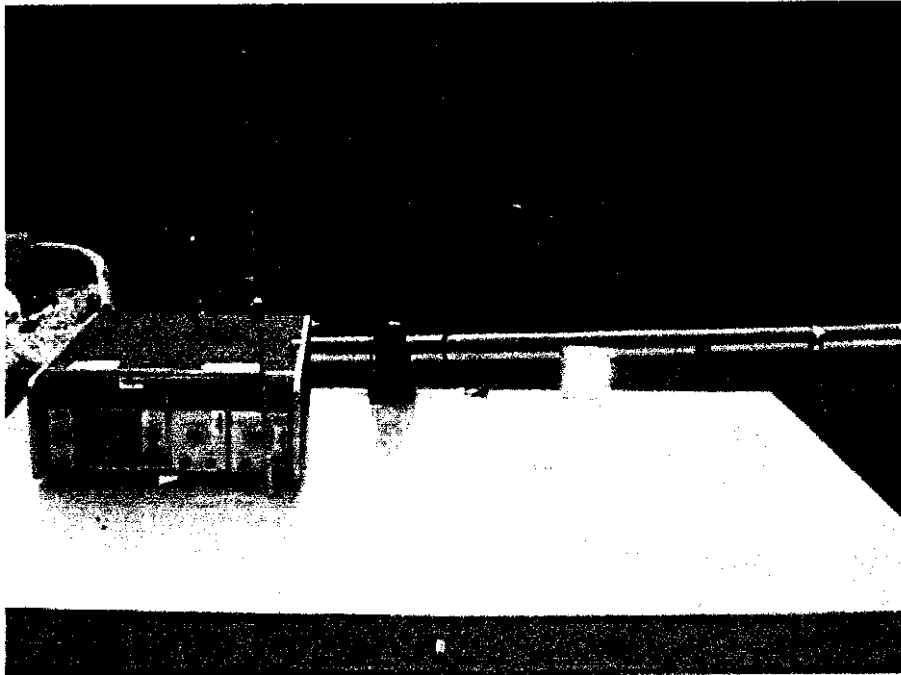
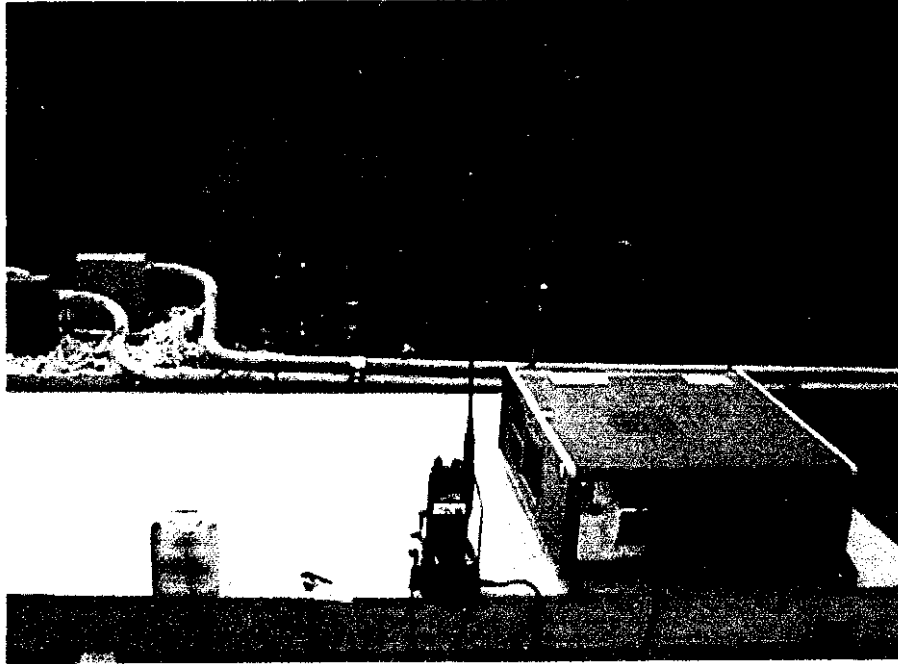
**TEST PERSONNEL:**

Signature: 

Date: 4/11/98

Typed/Printed Name: K. Franck Schuppious

## 6.0 RADIATED MEASUREMENT PHOTOS





## 7.0 RADIATED EMISSION DATA

The following data lists the significant emission frequencies, measured levels, correction factor (includes cable and antenna corrections), the corrected reading, plus the limit. Explanation of the Correction Factor is given in paragraph 7.1.

**TABLE 19: RADIATED EMISSIONS: 30 MHZ**

(Temperature: 41F Degree, Humidity: 98%)

EMISSION FREQUENCY (MHz)	ANTENNA POLARITY (H/V)	ANALYZER READING (dBuV) *	SITE CORRECTION FACTOR (dB/m)	EMISSION LEVEL (dBuV/m)	FCC LIMIT (dBuV/m)	FCC MARGIN (dBuV/m)
230.461	H	53.9	-24	29.9	46.0	-16.1
384.072	H	43.1	-19.2	23.9	46.0	-22.1
460.909	H	46.3	-17.7	28.6	46.0	-17.4
691.202	V	53.6	-13.0	40.6	46.0	-5.4
766.250	H	46.5	-11.9	34.6	46.0	-11.4

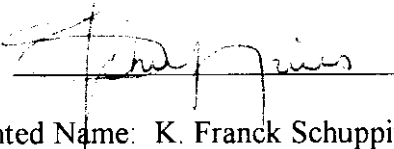
**TABLE 20: RADIATED EMISSIONS: 69 MHZ**

(Temperature: 41F Degree, Humidity: 98%)

EMISSION FREQUENCY (MHz)	ANTENNA POLARITY (H/V)	ANALYZER READING (dBuV)	SITE CORRECTION FACTOR (dB/m)	EMISSION LEVEL (dBuV/m)	FCC LIMIT (dBuV/m)	FCC MARGIN (dBuV/m)
171.702	H	45.6	-27.3	18.3	43.5	-25.2
230.500	H	55.3	-24.0	31.3	46.0	-14.7
460.916	H	45.5	-17.7	27.8	46.0	-18.2
691.200	V	52.1	-13.0	39.1	46.0	-6.9
805.250	H	53.4	-10.6	42.8	46.0	-3.2

*\*All readings are quasi-peak, unless stated otherwise. See Appendix C for Radiated Test Methodology.*

**TEST PERSONNEL:**

Signature: 

Date: 4/14/98

Typed/Printed Name: K. Franck Schuppis

**TABLE 21: RADIATED EMISSIONS: 108 MHZ**

(Temperature: 41F Degree, Humidity: 908%)

EMISSION FREQUENCY (MHz)	ANTENNA POLARITY (H/V)	ANALYZER READING (dBuV) *	SITE CORRECTION FACTOR (dB/m)	EMISSION LEVEL (dBuV/m)	FCC LIMIT (dBuV/m)	FCC MARGIN (dBuV/m)
171.720	H	45.8	-27.3	18.5	43.5	-25.0
230.453	H	56.3	-24.0	32.3	46.0	-13.7
384.090	H	42.3	-19.2	23.1	46.0	-22.9
460.906	H	44.4	-17.7	26.7	46.0	-19.3
691.200	V	53.0	-13.0	40.0	46.0	-6.0
844.250	H	50.7	-10.6	40.1	46.0	-5.9

**TABLE 22: RADIATED EMISSIONS: 109 MHZ**

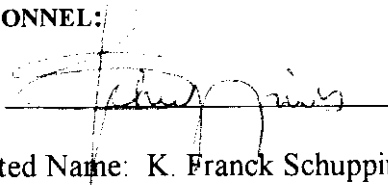
(Temperature: 41F Degree, Humidity: 98%)

EMISSION FREQUENCY (MHz)	ANTENNA POLARITY (H/V)	ANALYZER READING (dBuV) *	SITE CORRECTION FACTOR (dB/m)	EMISSION LEVEL (dBuV/m)	FCC LIMIT (dBuV/m)	FCC MARGIN (dBuV/m)
171.701	H	46.3	-27.3	19.0	43.5	-24.5
230.484	V	51.8	-24.0	27.8	46.0	-18.2
384.090	V	42.8	-19.2	23.6	46.0	-22.4
460.920	V	44.1	-17.7	26.4	46.0	-19.6
691.194	H	50.1	-13.0	37.1	46.0	-8.9
845.250	H	50.1	-10.6	39.5	46.0	-6.5

*\*All readings are quasi-peak, unless stated otherwise. See Appendix C for Radiated Test Methodology.*

**TEST PERSONNEL:**

Signature:



Date: 4/14/98

Typed/Printed Name: K. Franck Schuppius

**TABLE 23: RADIATED EMISSIONS: 139 MHZ**

(Temperature: 41F Degree, Humidity: 98%)

EMISSION FREQUENCY (MHz)	ANTENNA POLARITY (H/V)	ANALYZER READING (dBuV) *	SITE CORRECTION FACTOR (dB/m)	EMISSION LEVEL (dBuV/m)	FCC LIMIT (dBuV/m)	FCC MARGIN (dBuV/m)
230.458	H	58.6	-24.0	34.6	46.0	-11.4
384.072	V	42.1	-19.2	22.9	46.0	-23.1
460.916	H	46.6	-17.7	28.9	46.0	-17.1
691.200	V	52.3	-13.0	39.3	46.0	-6.7
875.250	H	50.4	-10.1	40.3	46.0	-5.7
921.585	H	44.2	-9.1	35.1	46.0	-10.9

**TABLE 24: RADIATED EMISSIONS: 170 MHZ**

(Temperature: 41F Degree, Humidity: 98%)

EMISSION FREQUENCY (MHz)	ANTENNA POLARITY (H/V)	ANALYZER READING (dBuV) *	SITE CORRECTION FACTOR (dB/m)	EMISSION LEVEL (dBuV/m)	FCC LIMIT (dBuV/m)	FCC MARGIN (dBuV/m)
230.45	H	58.2	-24	34.2	46.0	-11.8
384.102	V	43.1	-19.2	23.9	46.0	-22.1
460.921	V	47.9	-17.7	30.2	46.0	-15.8
691.203	V	54.5	-13.0	41.5	46.0	-4.5
906.250	V	52.9	-9.2	43.7	46.0	-2.3
921.600	H	35.4	-9.1	26.3	46.0	-19.7

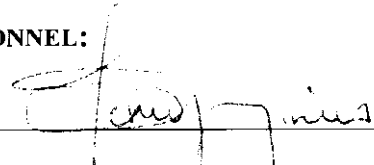
**TABLE 25: RADIATED EMISSIONS: 171 MHZ**

(Temperature: 41F Degree, Humidity: 98%)

EMISSION FREQUENCY (MHz)	ANTENNA POLARITY (H/V)	ANALYZER READING (dBuV) *	SITE CORRECTION FACTOR (dB/m)	EMISSION LEVEL (dBuV/m)	FCC LIMIT (dBuV/m)	FCC MARGIN (dBuV/m)
230.493	H	57.8	-24	33.8	46.0	-12.2
384.050	V	41.8	-19.2	22.6	46.0	-23.4
460.880	H	42.1	-17.7	24.4	46.0	-21.6
691.199	H	51.6	-13.0	38.6	46.0	-7.4
907.250	V	52.6	-9.2	43.4	46.0	-2.6
921.692	H	43.6	-9.1	34.5	46.0	-11.5

*\*All readings are quasi-peak, unless stated otherwise. See Appendix C for Radiated Test Methodology.***TEST PERSONNEL:**

Signature:



Date: 4/14/98

Typed/Printed Name: K. Franck Schuppis

**TABLE 26: RADIATED EMISSIONS: 196 MHz**

(Temperature: 41F Degree, Humidity: 98%)

EMISSION FREQUENCY (MHz)	ANTENNA POLARITY (H/V)	ANALYZER READING (dBuV) *	SITE CORRECTION FACTOR (dB/m)	EMISSION LEVEL (dBuV/m)	FCC LIMIT (dBuV/m)	FCC MARGIN (dBuV/m)
230.514	V	57.5	-24	33.5	46.0	-12.5
307.272	H	46.4	-21.4	25.0	46.0	-21.0
384.05	H	43.6	-19.2	24.4	46.0	-21.6
460.892	H	46.1	-17.7	28.4	46.0	-17.6
921.848	H	37.6	-9.1	28.5	46.0	-17.5
932.250	V	52.4	-9.1	43.3	46.0	-2.7

**TABLE 27: RADIATED EMISSIONS: 222 MHz**

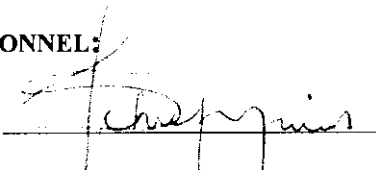
(Temperature: 41F Degree, Humidity: 98%)

EMISSION FREQUENCY (MHz)	ANTENNA POLARITY (H/V)	ANALYZER READING (dBuV) *	SITE CORRECTION FACTOR (dB/m)	EMISSION LEVEL (dBuV/m)	FCC LIMIT (dBuV/m)	FCC MARGIN (dBuV/m)
153.672	H	46.1	-28.2	17.9	43.5	-25.6
230.460	H	58.2	-24.0	34.2	46.0	-11.8
460.896	V	43.8	-17.7	26.1	46.0	-19.9
537.672	H	39.5	-15.8	23.7	46.0	-22.3
691.206	H	48.1	-13.0	35.1	46.0	-10.9
958.250	V	46.6	-3.3	43.3	46.0	-2.7

*\*All readings are quasi-peak, unless stated otherwise. See Appendix C for Radiated Test Methodology.*

**TEST PERSONNEL:**

Signature: \_\_\_\_\_



Date: 4/14/98

Typed/Printed Name: K. Franck Schuppis

**TABLE 28: RADIATED EMISSIONS: 223 MHZ**

(Temperature: 41F Degree, Humidity: 98%)

EMISSION FREQUENCY (MHz)	ANTENNA POLARITY (H/V)	ANALYZER READING (dBuV) *	SITE CORRECTION FACTOR (dB/m)	EMISSION LEVEL (dBuV/m)	FCC LIMIT (dBuV/m)	FCC MARGIN (dBuV/m)
230.453	V	55.6	-24.0	31.6	46.0	-14.4
307.285	H	46.5	-21.4	25.1	46.0	-20.9
384.095	V	44.2	-19.2	25.0	46.0	-21.0
460.888	H	43.3	-17.7	25.6	46.0	-20.4
691.269	V	53.3	-13.0	40.3	46.0	-5.7
960.252	V	46.7	-3.3	43.4	46.0	-2.6

**TABLE 29: RADIATED EMISSIONS: 346 MHZ**

(Temperature: 41F Degree, Humidity: 98%)

EMISSION FREQUENCY (MHz)	ANTENNA POLARITY (H/V)	ANALYZER READING (dBuV) *	SITE CORRECTION FACTOR (dB/m)	EMISSION LEVEL (dBuV/m)	FCC LIMIT (dBuV/m)	FCC MARGIN (dBuV/m)
230.463	H	59.8	-24.0	35.8	46.0	-10.2
307.285	H	45.0	-21.4	23.6	46.0	-22.4
384.095	H	45.4	-19.2	26.2	46.0	-19.8
460.878	V	51.5	-17.7	33.8	46.0	-12.2
460.902	H	42.4	-17.7	24.7	46.0	-21.3
691.305	H	47.7	-13.0	34.7	46.0	-11.3
921.720	H	41.0	-9.1	31.9	46.0	-14.1

**TABLE 30: RADIATED EMISSIONS: 470 MHZ**

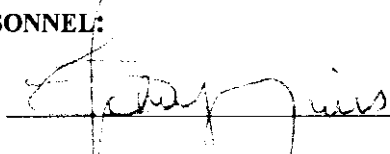
(Temperature: 41F Degree, Humidity: 98%)

EMISSION FREQUENCY (MHz)	ANTENNA POLARITY (H/V)	ANALYZER READING (dBuV) *	SITE CORRECTION FACTOR (dB/m)	EMISSION LEVEL (dBuV/m)	FCC LIMIT (dBuV/m)	FCC MARGIN (dBuV/m)
44.395	H	44.2	-21.8	22.4	40.0	-17.6
230.489	H	48.6	-24.0	24.6	46.0	-21.4
267.370	H	46.9	-22.4	24.5	46.0	-21.5
384.102	V	45.4	-19.2	26.2	46.0	-19.8
614.460	V	43.6	-14.3	29.3	46.0	-16.7
745.528	V	55.2	-12.0	43.2	46.0	-2.8

*All readings are quasi-peak, unless stated otherwise. See Appendix C for Radiated Test Methodology.*

**TEST PERSONNEL:**

Signature:



Date: 4/14/98

Typed/Printed Name: K. Franck Schuppis

**TABLE 31: RADIATED EMISSIONS: 471 MHZ**

(Temperature: 41F Degree, Humidity: 98%)

EMISSION FREQUENCY (MHz)	ANTENNA POLARITY (H/V)	ANALYZER READING (dBuV) *	SITE CORRECTION FACTOR (dB/m)	EMISSION LEVEL (dBuV/m)	FCC LIMIT (dBuV/m)	FCC MARGIN (dBuV/m)
171.708	H	46.8	-27.3	19.5	43.5	-24.0
206.058	H	43.9	-25.7	18.2	43.5	-25.3
230.498	H	55.2	-24.0	31.2	46.0	-14.8
307.291	H	45.8	-21.4	24.4	46.0	-21.6
461.017	H	41.4	-17.7	23.7	46.0	-22.3
537.687	V	45.1	-15.8	29.3	46.0	-16.7
746.530	H	53.8	-12.0	41.8	46.0	-4.2

**TABLE 32: RADIATED EMISSIONS: 663 MHZ**

(Temperature: 41F Degree, Humidity: 28%)

EMISSION FREQUENCY (MHz)	ANTENNA POLARITY (H/V)	ANALYZER READING (dBuV) *	SITE CORRECTION FACTOR (dB/m)	EMISSION LEVEL (dBuV/m)	FCC LIMIT (dBuV/m)	FCC MARGIN (dBuV/m)
153.7	V	50.4	-28.2	22.2	43.5	-21.3
230.498	H	54.9	-24	30.9	46	-15.1
307.274	H	45	-21.4	23.6	46	-22.4
384.09	H	41.4	-19.2	22.2	46	-23.8
460.92	H	42.2	-17.7	24.5	46	-21.5
938.45	H	50	-8.9	41.1	46	-4.9

**TABLE 33: RADIATED EMISSIONS: 797 MHZ**

(Temperature: 41F Degree, Humidity: 28%)

EMISSION FREQUENCY (MHz)	ANTENNA POLARITY (H/V)	ANALYZER READING (dBuV) *	SITE CORRECTION FACTOR (dB/m)	EMISSION LEVEL (dBuV/m)	FCC LIMIT (dBuV/m)	FCC MARGIN (dBuV/m)
153.679	H	47.9	-28.2	19.7	43.5	-23.8
230.493	H	55.2	-24.0	31.2	46.0	-14.8
307.304	H	45.7	-21.4	24.3	46.0	-21.7
460.939	H	43.2	-17.7	25.5	46.0	-20.5
614.644	H	39.7	-14.3	25.4	46.0	-20.6
691.518	H	37.1	-13.0	24.1	46.0	-21.9

*\*All readings are quasi-peak, unless stated otherwise. See Appendix C for Radiated Test Methodology.***TEST PERSONNEL:**Signature: 

Date: 3/15/98

Typed/Printed Name: K. Franck Schuppis

**TABLE 34: RADIATED EMISSIONS: 798 MHZ**

(Temperature: 41F Degree, Humidity: 28%)

EMISSION FREQUENCY (MHz)	ANTENNA POLARITY (H/V)	ANALYZER READING (dBuV) *	SITE CORRECTION FACTOR (dB/m)	EMISSION LEVEL (dBuV/m)	FCC LIMIT (dBuV/m)	FCC MARGIN (dBuV/m)
153.608	H	42.5	-28.2	14.3	43.5	-29.2
230.464	H	54.0	-24.0	30.0	46.0	-16.0
307.286	H	47.1	-21.4	25.7	46.0	-20.3
460.953	H	34.3	-17.7	16.6	46.0	-29.4
614.539	H	36.5	-14.3	22.2	46.0	-23.8
691.135	H	37.6	-13.0	24.6	46.0	-21.4

**TABLE 35: RADIATED EMISSIONS: 895 MHZ**

(Temperature: 41F Degree, Humidity: 28%)

EMISSION FREQUENCY (MHz)	ANTENNA POLARITY (H/V)	ANALYZER READING (dBuV) *	SITE CORRECTION FACTOR (dB/m)	EMISSION LEVEL (dBuV/m)	FCC LIMIT (dBuV/m)	FCC MARGIN (dBuV/m)
153.700	H	44.7	-28.2	16.5	43.5	-27.0
230.490	H	52.8	-24.0	28.8	46.0	-17.2
307.280	H	46.5	-21.4	25.1	46.0	-20.9
460.980	H	40.8	-17.7	23.1	46.0	-22.9
537.648	H	40.4	-15.8	24.6	46.0	-21.4
691.388	H	42.5	-13.0	29.5	46.0	-16.5

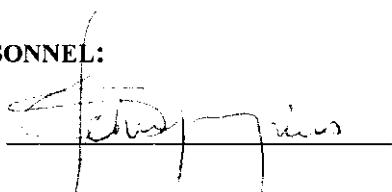
**TABLE 36: RADIATED EMISSIONS: 960 MHZ**

(Temperature: 41F Degree, Humidity: 28%)

EMISSION FREQUENCY (MHz)	ANTENNA POLARITY (H/V)	ANALYZER READING (dBuV) *	SITE CORRECTION FACTOR (dB/m)	EMISSION LEVEL (dBuV/m)	FCC LIMIT (dBuV/m)	FCC MARGIN (dBuV/m)
171.750	V	47.0	-27.3	19.7	43.5	-23.8
230.490	H	53.4	-24	29.4	46.0	-16.6
307.279	H	45.9	-21.4	24.5	46.0	-21.5
384.024	V	43.6	-19.2	24.4	46.0	-21.6
460.890	H	39.6	-17.7	21.9	46.0	-24.1
691.200	V	38.4	-13.0	25.4	46.0	-20.6

*\*All readings are quasi-peak, unless stated otherwise. See Appendix C for Radiated Test Methodology.***TEST PERSONNEL:**

Signature: \_\_\_\_\_



Date: 3/15/98

Typed/Printed Name: K. Franck Schuppis

## 7.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$\begin{aligned} \text{FI(dBuV/m)} &= \text{SAR(dBuV)} + \text{SCF(dB/m)} \\ \text{FI} &= \text{Field Intensity} \\ \text{SAR} &= \text{Spectrum Analyzer Reading} \\ \text{SCF} &= \text{Site Correction Factor} \end{aligned}$$

The Site Correction Factor (SCF) used in the above equation is determined empirically, and is expressed in the following equation:

$$\begin{aligned} \text{SCF(dB/m)} &= -\text{PG(dB)} + \text{AF(dB/m)} + \text{CL(dB)} \\ \text{SCF} &= \text{Site Correction Factor} \\ \text{PG} &= \text{Pre-amplifier Gain} \\ \text{AF} &= \text{Antenna Factor} \\ \text{CL} &= \text{Cable Loss} \end{aligned}$$

The field intensity in microvolts per meter can then be determined according to the following equation:

$$\text{FI(uV/m)} = 10^{\text{FI(dBuV/m)}/20}$$

For example, assume a signal at a frequency of 125 MHz has a received level measured as 49.3 dBuV. The total Site Correction Factor (antenna factor plus cable loss minus preamplifier gain) for 125 MHz is -11.5 dB/m. The actual radiated field strength is calculated as follows:

$$\begin{aligned} 49.3 \text{ dBuV} - 11.5 \text{ dB} &= 37.8 \text{ dBuV/m} \\ 10^{37.8/20} &= 10^{1.89} = 77.6 \text{ uV/m} \end{aligned}$$



## 8.0 PHOTOS OF TESTED EUT

The following photos are attached:

- FIGURE 3: Battery charger top
- FIGURE 4: Battery charger bottom
- FIGURE 5: Battery charger board, solder side
- FIGURE 6: Battery charger board, component side
- FIGURE 7: Battery charger, left side
- FIGURE 8: Battery charger, right side
- FIGURE 9: Battery charger, rear
- FIGURE 10: Battery charger, front
- FIGURE 11: Antenna
- FIGURE 12: Unit front
- FIGURE 13: Unit back
- FIGURE 14: Unit back with battery pack off
- FIGURE 15: Unit right
- FIGURE 16: Unit left
- FIGURE 17: Unit bottom
- FIGURE 18: Unit top
- FIGURE 19: Unit battery pack (label)
- FIGURE 20: Unit battery pack, inside
- FIGURE 21: Unit battery pack, outside
- FIGURE 22: Unit battery pack, right side
- FIGURE 23: Unit battery pack, left side
- FIGURE 24: Unit battery pack, top
- FIGURE 25: Unit battery pack, bottom
- FIGURE 26: Power connector (to external battery pack)
- FIGURE 27: Unit inside board 1, component side
- FIGURE 28: Unit inside board 2, component side
- FIGURE 29: Unit inside board 3, component side
- FIGURE 30: Unit inside board 1, solder side
- FIGURE 31: Unit inside board 2, solder side
- FIGURE 32: Unit inside board 3, solder side, bottom
- FIGURE 33: Inside rear cover
- FIGURE 34: Battery connection board with mounting
- FIGURE 35: Battery connection board with mounting, component side
- FIGURE 36: Inside front cover
- FIGURE 37: Main board, shielding removed, component side
- FIGURE 38: Main board, LCD side
- FIGURE 39: Side board, bottom
- FIGURE 40: Side board, top, button side
- FIGURE 41: Complete unit, front
- FIGURE 42: Complete unit, rear

## APPENDIX B: Emissions Equipment List

### TABLE 37: EMISSIONS TEST EQUIPMENT

DESCRIPTION	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CAL DATE	CAL DUE	CAL LAB
AMPLIFIER	HEWLETT PACKARD	11975A	2304A00348	1/14/98	1/14/99	TEST EQUITY
AMPLIFIER (S/A 1)	RHEIN TECH	PR-1040	N/A	12/8/97	12/8/98	RTL
AMPLIFIER (S/A 2)	RHEIN TECH	RTL2	N/A	11/16/97	11/16/98	RTL
AMPLIFIER (S/A 3)	RHEIN TECH	8447F	2944A03783	12/12/97	12/12/98	RTL
AMPLIFIER (S/A 4)	RHEIN TECH	8447D	2727A05397	12/8/97	12/8/98	RTL
BICONICAL/LOG ANTENNA 1	ANTENNA RESEARCH	1.PB-2520	1037	12/30/97	12/30/98	LIBERTY LABS
BICONICAL/LOG ANTENNA 2	ANTENNA RESEARCH	1.PB-2520	1036	1/16/98	1/16/99	LIBERTY LABS
FIELD SITE SOURCE	EMCO	4610	9604-1313	6/2/97	6/2/98	RTL
FILTER (ROOM 1)	SOLAR	8130	947305	8/15/97	8/15/98	RTL
FILTER (ROOM 2)	SOLAR	8130	947306	8/15/97	8/15/98	RTL
HARMONIC MIXER 1	HEWLETT PACKARD	11970K	2332A00563	11/27/96	11/27/98	TELOGY
HARMONIC MIXER 2	HEWLETT PACKARD	11970A	2332A01199	11/27/96	11/27/98	TELOGY
HORN ANTENNA 1	EMCO	3160-10	9606-1033	6/17/96	6/17/96	EMCO
HORN ANTENNA 2	EMCO	3160-9	9605-1051	6/17/96	6/17/98	EMCO
HORN ANTENNA 3	EMCO	3160-7	9605-1054	6/17/96	6/17/98	EMCO
HORN ANTENNA 4	EMCO	3160-8	9605-1044	6/17/96	6/17/98	EMCO
HORN ANTENNA 5	EMCO	3160-03	9508-1024	6/17/96	6/17/98	EMCO
LISN (ROOM 1/L1)	SOLAR	7225-1	N/A	8/15/97	8/15/98	ACUCAL
LISN (ROOM 1/L2)	SOLAR	7225-1	N/A	8/15/97	8/15/98	ACUCAL
LISN (ROOM 2/L1)	SOLAR	7225-1	900078	8/15/97	8/15/98	ACUCAL
LISN (ROOM 2/L2)	SOLAR	7225-1	900077	8/15/97	8/15/98	ACUCAL
PRE-AMPLIFIER	HEWLETT PACKARD	8449B OPT	3008A00505	1/8/98	1/8/00	TELOGY
QUASI-PEAK ADAPTER (S/A 1)	HEWLETT PACKARD	85650A	3145A01599	3/24/97	3/24/98	ACUCAL
QUASI-PEAK ADAPTER (S/A 2)	HEWLETT PACKARD	85650A	2811A01276	11/8/97	11/8/98	ACUCAL
QUASI-PEAK ADAPTER (S/A 3)	HEWLETT PACKARD	85650A	2521A00473	7/2/97	7/2/98	ACUCAL
QUASI-PEAK ADAPTER (S/A 4)	HEWLETT PACKARD	85650A	2521A01032	3/24/97	3/24/98	ACUCAL
RF PRESELECTOR (S/A 1)	HEWLETT PACKARD	85685A	3146A01309	N/A	N/A	ACUCAL
SIGNAL GENERATOR (HP)	HEWLETT PACKARD	8660C	1947A02956	3/26/97	3/26/98	ACUCAL
SIGNAL GENERATOR (WAVETEK)	WAVETEK	3510B	4952044	3/21/97	3/20/98	ACUCAL
SPECTRUM ANALYZER 1	HEWLETT PACKARD	8566B	3138A07771	8/28/97	8/28/98	ACUCAL
SPECTRUM ANALYZER 2	HEWLETT PACKARD	8567A	2841A00614	11/9/97	11/9/98	ACUCAL
SPECTRUM ANALYZER 4	HEWLETT PACKARD	8567A	2727A00535	11/8/97	11/6/98	ACUCAL
TUNABLE DIPOLE	EMCO	3121	274	1/19/98	1/19/99	LIBERTY LABS

## APPENDIX C: Conducted and Radiated 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 (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. 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.*

# **APPENDIX D:**

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# **USER'S MANUAL**

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