3.0 SYSTEM TEST CONFIGURATION

3.1 JUSTIFICATION

The system was configured for testing in a typical fashion (as a customer would normally use it). Worst case conducted emissions and radiated emissions are presented in 1024 x 768 @ 84 Hz and 1280 X 1024 @ 60 Hz modes. CPU speed: 166 MHz.

The EUT was tested with all ports attached to external peripherals. The monitor was investigated as powered from the wall outlet since there is no auxiliary power outlet.

3.2 EUT EXERCISE SOFTWARE

The EUT exercise program used during radiated and conducted testing has been designed to exercise the various system components in a manner similar to a typical use. The software, contained on the hard disk drive, sequentially exercises each system component. 1) an H prints on the monitor, (2) an H prints on the printer 3) an H is sent to serial ports, 4) a file is read from the floppy diskette, 5) a file is read from the hard drive and any other hard drive present, 6) a file is read from the CD-ROM drive. In cases that implement the use of Universal Serial Bus (USB) ports, a looped batch program is initiated to render a continuous flow of data through the USB ports. The complete cycle takes less than one second and is repeated continually. Systems that utilize network cards are connected to a server and are configured to transmit and receive packets of data continuously. As the keyboard and mouse are strictly input devices, no data was transmitted to them during test. They are, however, continuously scanned for data input activity.

3.3 SPECIAL ACCESSORIES

The end user is advised that he/she should use the same type of cables as those mentioned in Table 1 of this test report.

3.4 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. The modifications on the following page 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: October 1, 1998

Typed/Printed Name: Bruno Clavier

Position: Quality Manager
(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.

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: 1024 X 768 @ 84 Hz

NEUTRAL SIDE (L1)

EMISSION FREQUENCY (MHz)	TEST / DETECTOR (1)	ANALYZER READING (dBuV)	SITE CORRECTION FACTOR (dBuV)	CORRECTED EMISSION LEVEL (dBuV)	EN55022/ CISPR22 QUASI PEAK LIMIT (dBuV)	EN55022/ CISPR22 QUASI PEAK MARGIN (dBuV)	EN55022 / CISPR22 AVERAGE LIMIT (dBuV)	EN55022 / CISPR22 AVERAGE MARGIN (dBuV)
0.207	Pk	48.6	0.3	48.9	63.3	-14.4	53.3	-4.4
0.276	Pk	46.4	0.3	46.7	60.9	-14.2	50.9	-4.2
23.716	Pk	40.3	3.4	43.7	60.0	-16.3	50.0	-6.3
25.922	Pk	41.0	4.0	45.0	60.0	-15.0	50.0	-5.0
26.615	Pk	40.0	4.1	44.1	60.0	-15.9	50.0	-5.9
27.300	Pk	38.0	4.3	42.3	60.0	-17.7	50.0	-7.7

HOT SIDE (Line 2)

0.205	Pk	49.9	0.3	50.2	63.4	-13.2	53.4	-3.2
0.205	Qp	50.3	0.3	50.6	63.4	-12.8	53.4	-2.8
0.207	Av	49.6	0.3	49.9	63.3	-13.4	53.3	-3.4
0.278	Pk	45.8	0.3	46.1	60.9	-14.8	50.9	-4.8
23.716	Pk	37.8	3.1	40.9	60.0	-19.1	50.0	-9.1
24.474	Pk	38.4	3.2	41.6	60.0	-18.4	50.0	-8.4
25.166	Pk	39.1	3.4	42.5	60.0	-17.5	50.0	-7.5
27.716	Pk	35.1	3.9	39.0	60.0	-21.0	50.0	-11

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

TEST PERSONNEL:

Signature: Elizabeth Szrajer **Date:** 9/28/98

Typed/Printed Name: Elizabeth Szrajer

TABLE 3: CONDUCTED EMISSIONS: 1280 X 1024 @ 60 Hz

NEUTRAL SIDE (L1)

EMISSION FREQUENCY (MHz)	TEST / DETECTOR (1)	ANALYZER READING (dBuV)	SITE CORRECTION FACTOR (dBuV)	CORRECTED EMISSION LEVEL (dBuV)	EN55022/ CISPR22 QUASI PEAK LIMIT (dBuV)	EN55022/ CISPR22 QUASI PEAK MARGIN (dBuV)	EN55022 / CISPR22 AVERAGE LIMIT (dBuV)	EN55022 / CISPR22 AVERAGE MARGIN (dBuV)
0.193	Pk	50.2	0.2	50.4	63.9	-13.5	53.9	-3.5
0.193	Qp	49.1	0.2	49.3	63.9	-14.6	53.9	-4.6
0.193	Av	48.1	0.2	48.3	63.9	-15.6	53.9	-5.6
0.257	Pk	46.6	0.3	46.9	61.5	-14.6	51.5	-4.6
18.047	Pk	35.4	3.4	38.8	60.0	-21.2	50.0	-11.2
20.104	Pk	31.9	3.1	35.0	60.0	-25.0	50.0	-15.0
24.666	Pk	39.3	3.7	43.0	60.0	-17.0	50.0	-7.0
27.104	Pk	43.1	4.2	47.3	60.0	-12.7	50.0	-2.7
27.105	Av	37.8	4.2	42.0	60.0	-18.0	50.0	-8.0
27.107	Qp	42.1	4.2	46.3	60.0	-13.7	50.0	-3.7

HOT SIDE (Line 2)

0.192	Pk	50.1	0.2	50.3	63.9	-13.6	53.9	-3.6
0.192	Qp	49.6	0.2	49.8	63.9	-14.1	53.9	-4.1
0.193	Av	48.8	0.2	49.0	63.9	-14.9	53.9	-4.9
0.256	Pk	46.5	0.3	46.8	61.6	-14.8	51.6	-4.8
19.331	Pk	28.8	3.2	32.0	60.0	-28.0	50.0	-18.0
20.810	Pk	30.1	3.3	33.4	60.0	-26.6	50.0	-16.6
24.791	Pk	36.7	3.3	40.0	60.0	-20.0	50.0	-10.0
27.105	Pk	39.4	3.6	43.0	60.0	-17.0	50.0	-7.0

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

TEST PERSONNEL:

Signature: Elizabeth Szrajer **Date:** 9/28/98

Typed/Printed Name: Elizabeth Szrajer

6.0 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 6.1.

TABLE 4: RADIATED EMISSIONS: 1024 X 768 @ 84 Hz

(Temperature: 79°F, Humidity: 24%)

EMISSION FREQUENCY (MHz)	ANTENNA POLARITY (H/V)	ANALYZER READING (dBuV)*	SITE CORRECTION FACTOR (dB/m)	EMISSION LEVEL (dBuV/m)	EN55022/ CISPR22 LIMIT (dBuV/m)	EN55022/ CISPR22 MARGIN (dBuV/m)
173.980	V	50.1	-23.4	26.7	30.0	-3.3
205.625	H	51.6	-26.4	25.2	30.0	-4.8
213.530	H	46.4	-21.1	25.3	30.0	-4.7
221.410	V	49.9	-24.9	25.0	30.0	-5.0
229.340	H	46.7	-20.1	26.6	30.0	-3.4
308.378	H	47.2	-21.7	25.5	37.0	-11.5
355.802	H	50.3	-20.5	29.8	37.0	-7.2
363.718	V	51.5	-20.1	31.4	37.0	-5.6
379.548	V	46.6	-19.7	26.9	37.0	-10.1

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

TEST PERSONNEL:

Signature: _____ for

Date: 9/28/98

Typed/Printed Name: Billy D. Young

TABLE 5: RADIATED EMISSIONS 1280 X 1024 @ 60 Hz

(TEMPERATURE: 83°F, HUMIDITY: 15%)

EMISSION FREQUENCY (MHz)	ANTENNA POLARITY (H/V)	ANALYZER READING (dBuV)*	SITE CORRECTION FACTOR (dB/m)	EMISSION LEVEL (dBuV/m)	EN55022/ CISPR22 LIMIT (dBuV/m)	EN55022/ CISPR22 MARGIN (dBuV/m)
108.454	V	49.7	-24.9	24.8	30.0	-5.2
153.654	V	49.2	-26.3	22.9	30.0	-7.1
180.754	V	46.7	-24.4	22.3	30.0	-7.7
189.804	V	51.1	-23.8	27.3	30.0	-2.7
198.809	V	50.1	-23.9	26.2	30.0	-3.8
216.909	H	48.5	-22.3	26.2	30.0	-3.8
234.964	V	45.3	-21.0	24.3	37.0	-12.7
243.999	V	42.5	-20.3	22.2	37.0	-14.8
343.379	V	44.1	-16.9	27.2	37.0	-9.8
361.434	V	44.7	-16.5	28.2	37.0	-8.8
370.484	V	45.2	-15.7	29.5	37.0	-7.5

All readings are quasi-peak unless stated otherwise. See Section 4.2 for Radiated Test Methodology.

TEST PERSONNEL:

Signature: _____ for Date: 9/28/98

Typed/Printed Name: Billy D. Young

6.1 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:

$$FI(dBuV/m) = SAR(dBuV) + SCF(dB/m)$$

FI = Field Intensity
SAR = Spectrum Analyzer Reading
SCF = Site Correction Factor

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

$$SCF(dB/m) = - PG(dB) + AF(dB/m) + CL(dB)$$

SCF = Site Correction Factor
PG = Pre-amplifier Gain
AF = Antenna Factor
CL = Cable Loss

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

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

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:

$$49.3 \text{ dBuV} - 11.5 \text{ dB} = 37.8 \text{ dBuV/m}$$

$$10^{37.8/20} = 10^{1.89} = 77.6 \text{ uV/m}$$