5. CONDUCTED POWER LINE TEST

5.1 TEST EQUIPMENT

THE FOLLOWING TEST EQUIPMENT WAS USED DURING THE CONDUCTED POWER LINE TEST :

EQUIPMENT/ FACILITIES	SPECIFICAT -IONS	MANUFACTURER	MODEL#/ SERIAL#	DATE OF CAL. & CAL.CENTER	DUE DATE
SPECTRUM ANALYZER	9 KHz TO 1 GHz	HP	8590L/ 3624A1317	AUGUST, 1998 ETC	1Y
EMI TEST RECEIVER	9 KHz TO 30 MHz	ROHDE & SCHWARZ	ESHS30/ 826003/008	AUGUST, 1998 ETC	1Y
LISN	50 uH, 50 ohm	SOLAR ELECTRONICS	9252-50-R24-BNC/ 951315	AUGUST, 1998 ETC	1Y
LISN	50 uH, 50 ohm	SOLAR ELECTRONICS	9252-50-R24-BNC/ 951318	AUGUST, 1998 ETC	1Y
SIGNAL GENERATOR	9 KHz TO 1080 MHz	ROHDE & SCHWARZ	SMY01/ 841104/019	APRIL, 1998 ITRI	1Y
POWER CONVERTER	0 TO 300 VAC 47 - 500 Hz	AFC	AFC-1KW/ 850510	APRIL, 1998 SRT	1Y

5.2 CONFIGURATION OF THE EUT

THE EUT WAS CONFIGURED ACCORDING TO ANSI C63.4 - 1992. ALL INTERFACE PORTS WERE CONNECTED TO THE APPROPRIATE PERIPHERALS. ALL PERIPHERALS AND CABLES ARE LISTED BELOW.

-EUT

DEVICE	MANUFACTURER	MODEL #	FCCID
PCMCIA	ZONET TECHNOLOGY INC.	GFM5600-CF	OAEGFM5600-CF

-REMARK

-INTERNAL DEVICES

DEVICE	MANUFACTURER	MODEL #	FCCID/DoC

-PERIPHERALS

DEVICE	MANUFACTURER	MODEL# / SERIAL#	FCC STATUS (FCCID/DoC)	CABLE
PRINTER	HP	2225C	BS46XU2225C	POWER-UNS DATA-S
NOTEBOOK	TOSHIBA	PA1269E LXCD	DoC	POWER-UNS

-REMARK

(1). CABLE - UNS : UNSHIELDED CABLE
S : SHIELDED CABLE

(2). CABLES - ALL 1m OR GREATER IN LENGTH-
BUNDLED ACCORDING TO ANSI C63.4 - 1992.

5.3 EUT OPERATING CONDITION

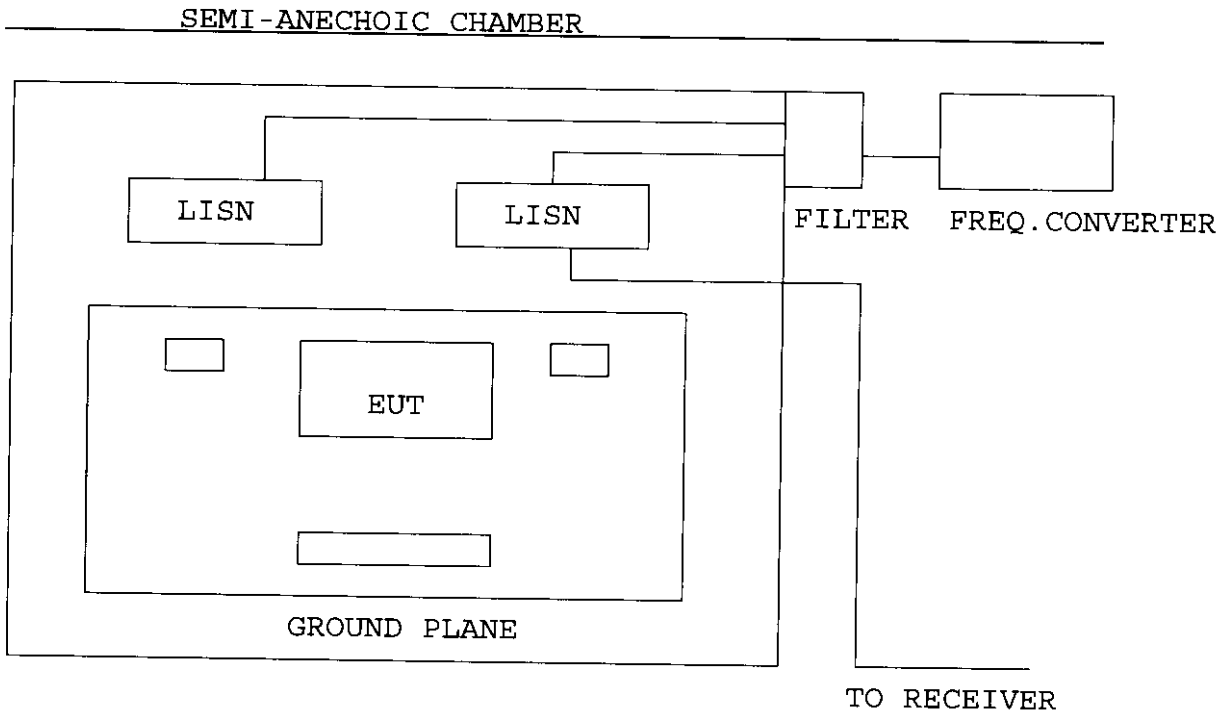
OPERATING CONDITION IS ACCORDING TO ANSI C63.4 - 1992.

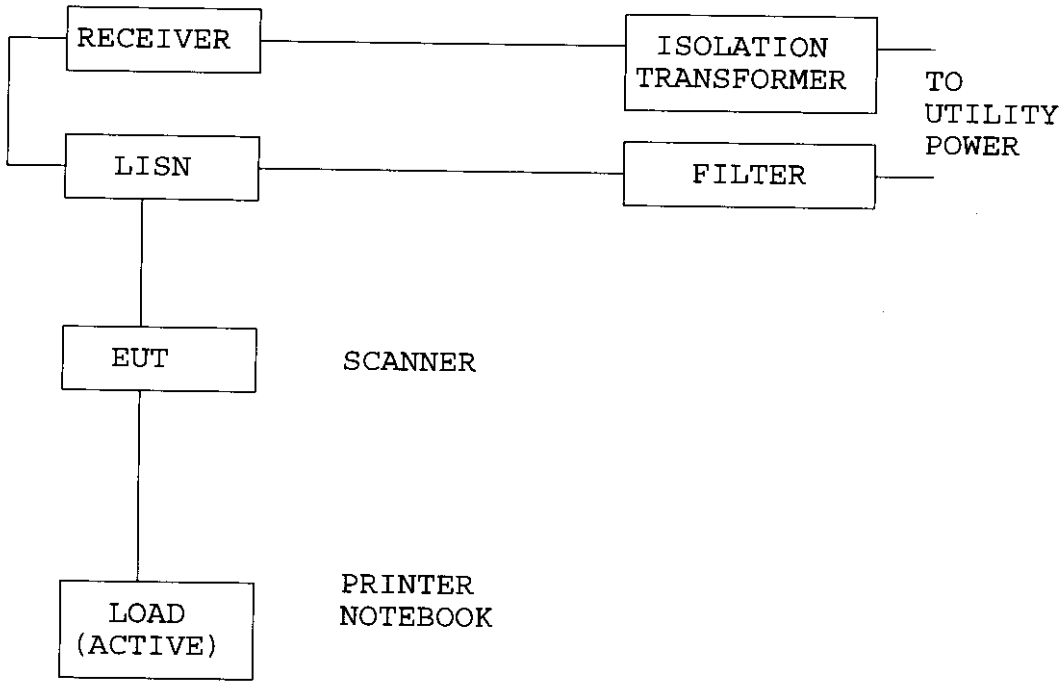
1. EUT POWER ON.
2. CONNECT EUT TO FILE SERVE & WORKSTATION.
3. SENT SIGNAL BETWEEN FILE SERVE & WORKSTATION (SIGNAL GO THROUGH EUT)
4. HUB SPEED : 10MBPS <----> 10MBPS
5. HUB WITH : TWIST PAIR CABLE (UNSHIELDED CABLE)
   (FIBER CABLE (UNSHIELDED CABLE)

5.4 TEST PROCEDURE

THE EUT WAS TESTED ACCORDING TO ANSI C63.4 - 1992. THE CONDUCTED TEST WAS PERFORMED ACCORDING TO ANSI C63.4 7.2TEST PROCEDURES. THE FREQUENCY SPECTRUM FROM 0.45 MHz TO 30 MHz WAS INVESTIGATED. THE LISN USED WAS 50 ohm / 50 uHenry AS SPECIFIED BY SECTION 5.1 OF ANSI C63.4 - 1992.CABLES AND PERIPHERALS WERE MOVED TO FIND THE MAXIMUM EMISSION LEVELS FOR EACH FREQUENCY.

5.5 TEST SETUP





5.6 CONDUCTED POWER LINE EMISSION LIMIT

FREQUENCY RANGE (MHz)	CLASS A	CLASS B
0.045 - 1.705	1000 uV	250 uV
1.705 - 30	3000 uV	250 uV

NOTE : IN THE ABOVE TABLE, THE TIGHTER LIMIT APPLIES AT THE BAND EDGES.

5.7 CONDUCTED POWER LINE TEST RESULT

THE FREQUENCY SPECTRUM FROM 0.45 MHz TO 30 MHz WAS INVESTIGATED. ALL READINGS ARE QUASI-PEAK VALUES WITH A RESOLUTION BANDWIDTH OF 9 KHz.

TEMPERATURE : 28 C

HUMIDITY : 78 %RH

FREQUENCY(MHz)	LINE 1 (uv)	LINE 2 (uv)	LIMIT (uv)
0.66	38.46	40.74	250
0.77	42.17	38.46	250
3.68	4.519	9.661	250
8.28	17.38	*	250
26.6	36.73	31.62	250

REMARKS : (1).* = MEMENT DOES NOT APPLY FOR THIS FREQUENCY

(2).UNCERTAINTY IN CONDUCTED EMISSION MEASURED IS <+/-2dB

(3).HUB SPEED : 10MBPS <----> 10MBPS

(4).TEST CONFIGURATION PLEASE SEE 4.2

(5).TEST EQUIPMENT PLEASE SEE 4.1

(6).ANY DEPARTURE FROM SPECIFICATION:N/A

SIGNED BY TESTING ENGINEER : _____

6. RADIATED EMISSION TEST

6.1 TEST EQUIPMENT

THE FOLLOWING TEST EQUIPMENT WAS USED DURING THE RADIATED EMISSION TEST :

EQUIPMENT / FACILITIES	SPECIFICAT -IONS	MANUFACTUR -ER	MODEL#/ SERIAL#	DATE OF CAL. & CAL. CENTER	DUE DATE
RECEIVER	20 MHz TO 1000 MHz	R & S	ESVS 30/ 841977/003	APRIL, 1998 ITRI	1Y
SPECTRUM ANALYZER	100 Hz TO 1500 MHz	HP	8568B/ 3019A05294	OCT, 1998 ETC	1Y
SPECTRUM ANALYZER	9 KHz TO 22 GHz	HP	8593E/ 3322A00670	APRIL, 1998 ITRI	1Y
SPECTRUM ANALYZER	100 Hz TO 1000 MHz	IFR	A-7550/ 2684/1248	JULY, 1998 ETC	1Y
SIGNAL GENERATOR	9 KHz TO 1080 MHz	ROHDE & SCHWARZ	SMY01/ 841104/019	APRIL, 1998 ITRI	1Y
DIPOLE ANTENNA	28 MHz TO 1000 MHz	EMCO	3121C/ 9003-535	DEC,1997 SRT	1Y
DIPOLE ANTENNA	28 MHz TO 1000 MHz	EMCO	3121C/ 9611-1239	DEC, 1997 SRT	1Y
BI-LOG ANTENNA	26 MHz TO 2000 MHz	EMCO	3142/ 9509-1152	DEC, 1997 SRT	1Y
BI-LOG ANTENNA	26 MHz TO 1100 MHz	EMCO	3143/ 9509-1152	DEC, 1997 SRT	1Y
PRE-AMPLIFIER	0.1 MHz TO 1300 MHz	HP	8447D/ 2944A08402	APRIL, 1998 ITRI	1Y
PRE-AMPLIFIER	0.1 MHz TO 1300 MHz	HP	8447D/ 2944A06412	AUGUST, 1998 ETC	1Y
HORN ANTENNA	1 GHz TO 18 GHz	EMCO	3115/ 9012-3619	DEC, 1997 SRT	1Y

6.2 CONFIGURATION OF THE EUT

SAME AS SECTION 5.4 OF THIS REPORT.

6.3 EUT OPERATING CONDITION

SAME AS SECTION 5.3 OF THIS REPORT.

6.4 TEST PROCEDURE

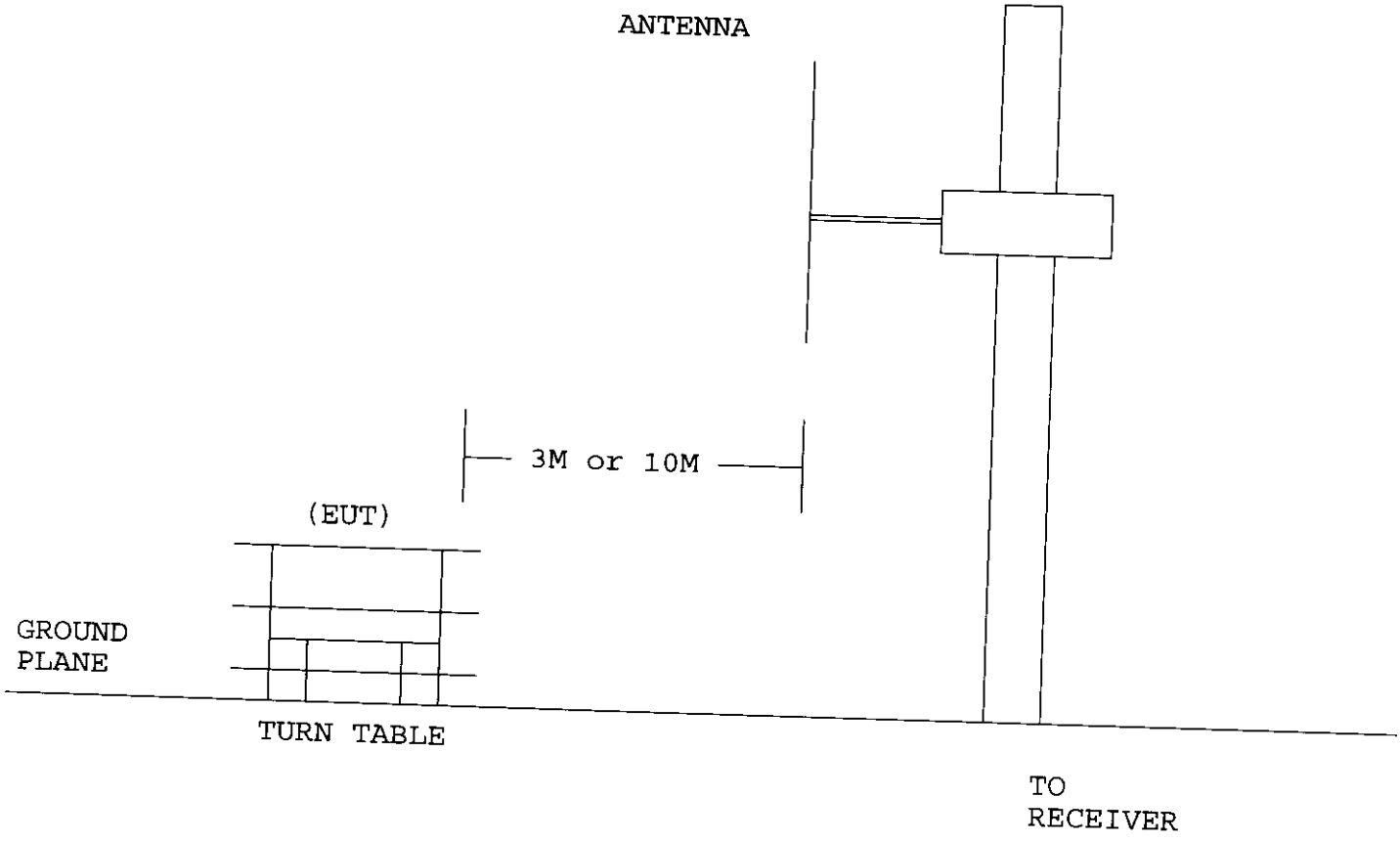
THE EUT WAS TESTED ACCORDING TO ANSI C63.4 - 1992. THE RADIATED TEST WAS PERFORMED AT SRT LAB's OPEN SITE. THIS SITE IS ON FILE WITH THE FCC LABORATORY DIVISION, REFERENCE 31040/SIT.

THE FREQUENCY SPECTRUM FROM 30 MHz TO 1 GHz WAS INVESTIGATED.MEASUREMENTS WERE MADE AT THREE METERS WITH AN ADJUSTABLE DIPOLE ANTENNA. PERIPHERALS, CABLES, EUT ORIENTATION, AND ANTENNA HEIGHT WERE VARIED TO FIND THE MAXIMUM EMISSION FOR EACH FREQUENCY.

THE FREQUENCY SPECTRUM FROM 30 MHz TO 2 GHz WAS INVESTIGATED. THE MEASUREMENTS UNDER 1 GHz WITH RESOLUTION BANDWIDTH OF 120 KHz ARE QUASI-PEAK READING MADE AT THREE METERS USING AN ADJUSTABLE DIPOLE ANTENNA. PERIPHERALS, CABLES, EUT ORIENTATION, AND ANTENNA HEIGHT WERE VARIED TO FIND THE MAXTMUM EMISSION FOR EACH FREQUENCY.

THE MEASUREMENTS ABOVE 1 GHz WITH A RESOLUTION BANDWIDTH OF 1 MHz ARE PEAK READING AT A DISTANCE OF THREE METERS WITH A HORN ANTENNA.

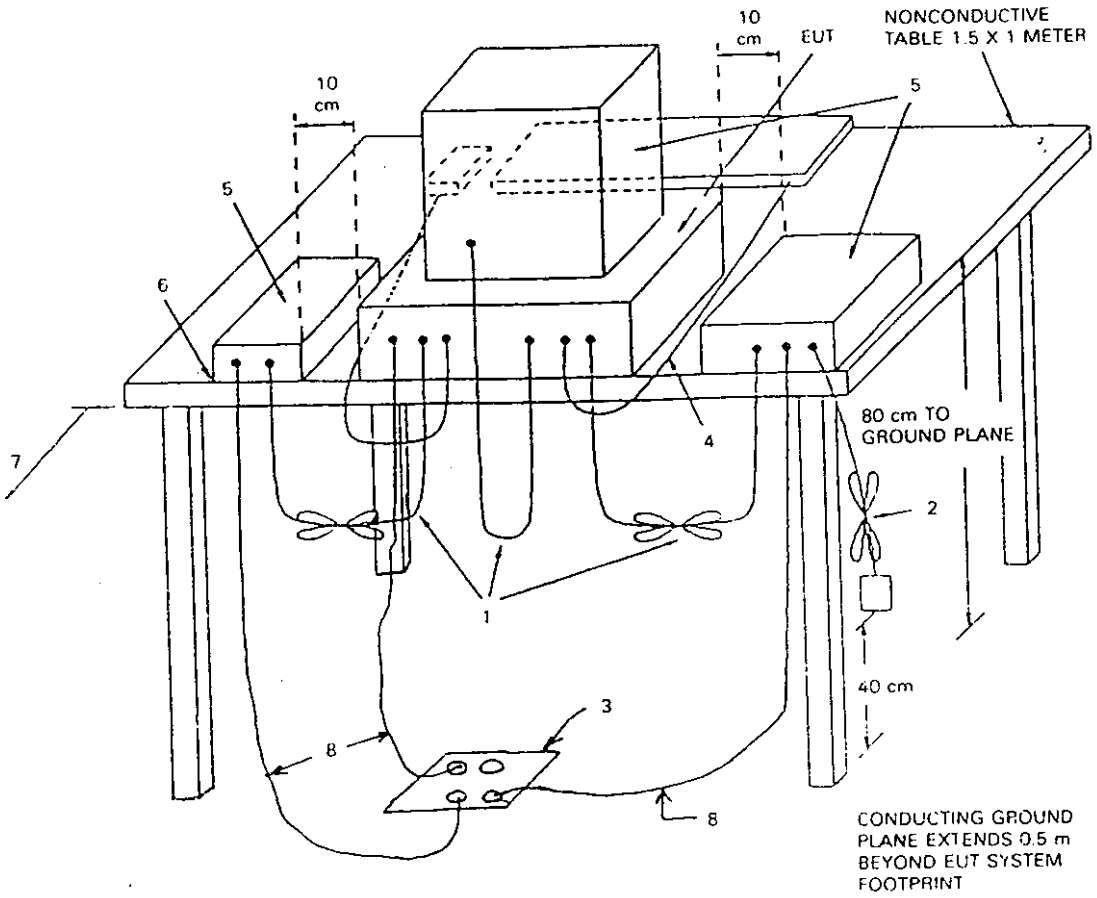
6.5 RADIATED TEST SETUP



6.5 RADIATED TEST SETUP

ELECTRICAL AND ELECTRONIC EQUIPMENT IN THE RANGE OF 9 kHz TO 40 GHz

ANSI C63.4-1992



LEGEND:

1. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth forming a bundle 30 to 40 cm long, hanging approximately in the middle between ground plane and table.
2. I/O cables that are connected to a peripheral shall be bundled in center. The end of the cable may be terminated if required using correct terminating impedance. The total length shall not exceed 1 m.
3. If LISNs are kept in the test setup for radiated emissions, it is preferred that they be installed under the ground plane with the receptacle flush with the ground plane.
4. Cables of hand-operated devices, such as keyboards, mouses, etc., have to be placed as close as possible to the controller.
5. Non-EUT components of EUT system being tested.
6. The rear of all components of the system under test shall be located flush with the rear of the table.
7. No vertical conducting wall used.
8. Power cords drape to the floor and are routed over to receptacle.

6.6 RADIATED EMISSION LIMIT

ALL EMISSION FROM A DIGITAL DEVICE, INCLUDING ANY NETWORK OF CONDUCTORS AND APPARATUS CONNECTED THERETO, SHALL NOT EXCEED THE LEVEL OF FIELD STRENGTH SPECIFIED BELOW :

CLASS B

FREQUENCY (MHz)	DISTANCE (m)	FIELD STRENGTH (uV/m)
30 - 88	3	100
88 - 216	3	150
216 - 960	3	200
ABOVE 960	3	500

CLASS B (OPEN CASE)

FREQUENCY (MHz)	DISTANCE (m)	FIELD STRENGTH (uV/m)
30 - 88	3	199.5
88 - 216	3	298.5
216 - 960	3	398.1

CLASS A

FREQUENCY (MHz)	DISTANCE (m)	FIELD STRENGTH (uV/m)
30 - 88	3	316.3
88 - 216	3	473.2
216 - 960	3	613.0
ABOVE 960	3	1000.0

NOTE : 1. IN THE EMISSION TABLES ABOVE, THE TIGHTER LIMIT APPLIES AT THE BAND EDGES.

2. DISTANCE REFERS TO THE DISTANCE BETWEEN MEASURING INSTRUMENT, ANTENNA, AND THE CLOSEST POINT OF ANY PART OF THE DEVICE OR SYSTEM.

6.7 RADIATED EMISSION TEST RESULT

THE FREQUENCY SPECTRUM FROM 30 MHz TO 1 GHz WAS INVESTIGATED. ALL READINGS UNDER 1 GHz ARE QUASI-PEAK VALUES WITH A RESOLUTION BANDWIDTH OF 120 KHz. MEASUREMENTS WERE MADE AT 3 METERS. THE MEASUREMENTS ABOVE 1 GHz WITH A RESOLUTION BANDWIDTH OF 1 MHz ARE PEAK READING AT A DISTANCE OF 3 METERS.

TEMPERATURE : 28 C HUMIDITY : 78 %RH

FREQ. (MHz)	CABLE LOSS (dB)	ANT. FACTOR (dB)	READING(dBuV)		EMISSION(uV)		LMTS (uV)
			HORIZ	VERT	HORIZ	VERT	
87.11	0.80	7.20	24.90	21.40	44.16	29.51	100
133.3	0.60	8.10	*	23.50	*	40.74	150
198.0	0.90	10.4	22.10	*	46.77	*	150
534.1	2.00	19.7	16.20	*	78.52	*	200
599.8	1.80	20.7	16.40	16.80	88.10	92.26	200
733.1	2.00	22.5	18.10	16.90	134.9	117.5	200
867.0	2.70	23.8	15.90	15.60	131.8	123.0	200

REMARKS : (1). MEASUREMENT DOES NOT APPLY FOR THIS FREQUENCY.

(2). THE MAXIMUM CONDITION WAS WITH THE MONITOR POWER CORD CONNECTED TO THE PERSONAL COMPUTER.

(3). SAMPLE CALCULATION
20 LOG(EMISSION)uV/m =CABLE LOSS(dB)+FACTOR(dB)+READING (dBuV/m)

(4). HUB SPEED : 10MBPS <-----> 10MBPS

(5). TEST EQUIPMENT PLEASE SEE 5.1

(6). UNCERTAINTY IN RADIATED EMISSION MEASURED IS <+/-4dB

(7). ANY DEPARTURE FROM SPECIFICATION:N/A

SIGNED BY TESTING ENGINEER : _____