

Exhibit C - Measurement Report



ELECTROMAGNETIC INTERFERENCE TEST REPORT

Company : CyberTAN Technology Inc.
Address : Bldg. 53, 195-56 Sec. 4, Chung Hsing Rd., Chutung, Hsinchu,
TAIWAN 310, R.O.C.
Sample name : Switch
Model : RES-1002
Date Received : JUL. 29, 1998
Date Tested : JUL. 30, 1998

MEASUREMENT PROCEDURE USED :
CISPR 22, CLASS B, 1996
FCC RULE PART 15, 1996

WE HEREBY CERTIFY THAT: The measurements shown in the attachment were made in accordance with the procedures indicated, and the energy emitted by the equipment was found to be within the limits applicable. We assume full responsibility for the accuracy and completeness of these measurements and vouch for the qualifications of all persons taking them.

	Name	Signature	Date
Testing Engineer	C.F.Wu/NVLAP	C.F. Wu	Aug. 21, 1998
Approving Manager	Paul Y. Liao/NVLAP	Paul Y. Liao	Aug. 21, 1998

Notes :

1. This report will be invalid if duplicated or photocopied in part.
2. This report refers only to the specimen(s) submitted to test, and is invalid as separately used.
3. This report is invalid without examination stamp and signature of this institute.
4. The tested specimen(s) will be preserved for thirty days from the date issued.
5. This is a NIST/NVLAP accredited report but not constituted and endorsed by US government.



TABLE OF CONTENTS

<u>TITLE</u>	<u>PAGE NO.</u>
1. GENERAL INFORMATION.....	3
1.1 DESCRIPTION OF EUT & POWER	3
1.2 DESCRIPTION OF PERIPHERALS.....	4-5
1.3 EUT & PERIPHERALS SETUP DIAGRAM.....	6
1.4 EUT OPERATING CONDITION.....	7
1.5 DESCRIPTION OF TEST SITE	7
2. CONDUCTED POWERLINE TEST	8
2.1 TEST EQUIPMENTS	8
2.2 TEST SETUP.....	8
2.3 CONDUCTED POWER LINE EMISSION LIMIT.....	9
2.4 TEST PROCEDURE.....	9
2.5 UNCERTAINTY OF CONDUCTED EMISSION	9
2.6 LINE CONDUCTED RF VOLTAGE MEASUREMENT	10-11
2.7 PHOTOS OF CONDUCTION TEST.....	12
3. RADIATED EMISSION TEST	13
3.1 TEST EQUIPMENTS	13
3.2 TEST SETUP.....	13
3.3 RADIATION LIMIT	14
3.4 TEST PROCEDURE.....	14
3.5 UNCERTAINTY OF RADIATED EMISSION.....	14
3.6 RADIATED RF NOISE MEASUREMENT.....	15-16
3.7 PHOTOS OF OPEN SITE.....	17-18



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FCC ID : N89-RES-1002

Report No. : 500-8707-136

Page 3 of 18

1. GENERAL INFORMATION

1.1 DESCRIPTION OF EUT & POWER

MANUFACTURER : CyberTAN Technology Inc.

SAMPLE NAME : Switch

MODEL NUMBER : RES-1002

POWER SUPPLY : 120VAC/60Hz



1.2 DESCRIPTION OF PERIPHERALS

(1) PC

MODEL NUMBER : Vectra VE
SERIAL NUMBER : SG81350634
MANUFACTURER : HP CORP.
F.C.C. ID : -----
POWER CORD : Unshielded, Detachable, 1.8m

(2) MONITOR

MODEL NUMBER : D2821-60005
SERIAL NUMBER : TW73107382
MANUFACTURER : HP CORP
F.C.C. ID : -----
POWER CORD : Unshielded , Detachable , 1.8m

(3) KEYBOARD

MODEL NUMBER : SK-2502
SERIAL NUMBER : M980211167
MANUFACTURER : HP CORP.
F.C.C. ID : GYUR4ISK

(4) MOUSE

MODEL NUMBER : C3751B
SERIAL NUMBER : -----
MANUFACTURER : HP CORP.
F.C.C. ID : DZL211029

(5) PC

MODEL NUMBER : Vectra VE
SERIAL NUMBER : SG81350585
MANUFACTURER : HP CORP.
F.C.C. ID : -----
POWER CORD : Unshielded, Detachable, 1.8m

(6) MONITOR

MODEL NUMBER : D2821-60005
SERIAL NUMBER : TW73613332
MANUFACTURER : HP CORP
F.C.C. ID : -----
POWER CORD : Unshielded , Detachable , 1.8m



(7) KEYBOARD

MODEL NUMBER : SH-2502
SERIAL NUMBER : M980211309
MANUFACTURER : HP CORP.
F.C.C. ID : GYUR4ISK

(8) MOUSE

MODEL NUMBER : C3751B
SERIAL NUMBER : -----
MANUFACTURER : HP CORP.
F.C.C. ID : DZL211029

(9) FAST ETHERPAIR (2 sets)

MODEL NUMBER : EN1207C-TX
SERIAL NUMBER : -----
MANUFACTURER : ACCTON CORP
F.C.C. ID : -----

(10) MODEM

MODEL NUMBER : 4007AM
SERIAL NUMBER : A10740073303
MANUFACTURER : Hayes CORP.
F.C.C. ID : BFJ4000AM

(11) PRINTER

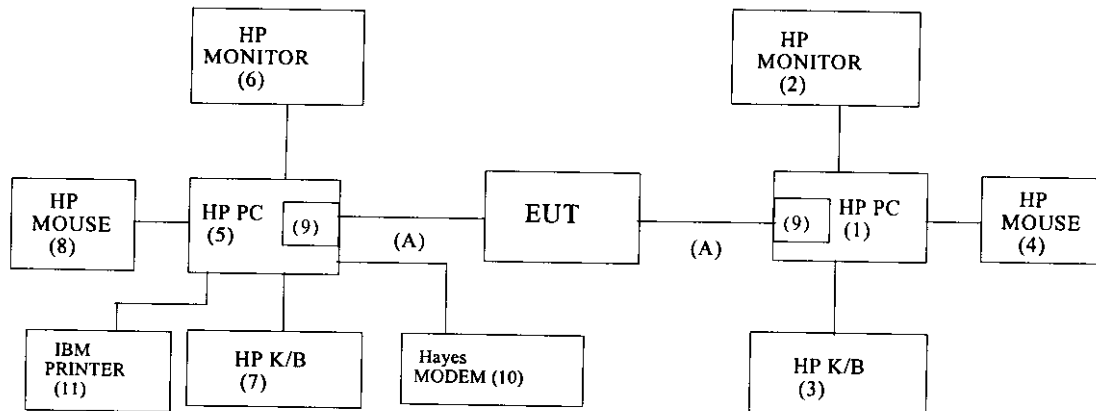
MODEL NUMBER : 5152-002
SERIAL NUMBER : 0754365
MANUFACTURER : IBM CORP.
F.C.C. ID : BKM9A85152002

(12) Cables

	Type	Connector	Shielded	length
(A)	Uncross-over twisted-pair	RJ-45, plastic	NO	15m



1.3 EUT & PERIPHERALS SETUP DIAGRAM



The indicated numbers (1)(2)---please refer to item 1.2.



1.4 EUT OPERATING CONDITION

(1) For 10Mbps mode

1. Powered on all equipments.
2. Use UTP Cable Connected PC(1) and PC(5) to EUT Device 10 port.
3. PC(1) and PC(5) ran "ACCTEST" program.
4. Repeated step 3 untill test ok.

(2) For 100Mbps mode

1. Powered on all equipments.
2. Use UTP Cable Connected PC(1) and PC(5) to EUT Device 100 port.
3. PC(1) and PC(5) ran "ACCTEST" program.
4. Repeated step 3 untill test ok.

1.5 DESCRIPTION OF TEST SITE

SITE DESCRIPTION : FCC certificate NO. : 31040/SIT
DNV certificate NO. : 510-96-1016
TUV certificate NO. : I9664582-9610
Lloyd's certificate NO. : LA003
BCIQ certificate NO. : SL2-IN-E-02
NVLAP Lab code : 200118-0
CNLA certificate NO. : CNLA-ZL97018
VCCI certificate NO. : C-706, R-629

NAME OF SITE : Electronics Research & Service Organization
Industrial Technology Research Institute

SITE LOCATION : K500, 195-4 , sec. 4, Chung Hsing Rd.,
Chu-Tung Chen. Hsin-Chu, Taiwan 31015 R.O.C.



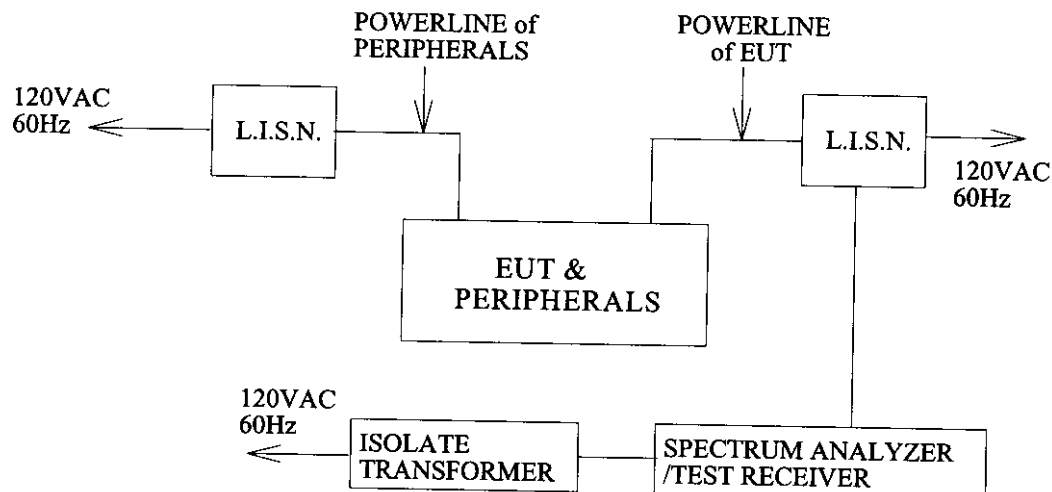
2. CONDUCTED POWERLINE TEST

2.1 TEST EQUIPMENTS

The following test equipments are used during the conducted powerline tests :

MANUFACTURER OR TYPE	MODEL No.	SERIAL No.	DATE OF CALIBRATION
SPECTRUM ANALYZER & DISPLAY	HP 8568A	2235A02320	MAR. 05, 1998
QUASI-PEAK ADAPTER	HP 85650 A	2341A00672	MAR. 05, 1998
ISOLATION TRANSFORMER	SOLAR 7032-1	N/A	N/A
L.I.S.N.	EMCO 3850/2	9311-1025 9401-1028	MAR. 24, 1998
TEST RECEIVER	R/S ESH3	8720791118	MAR. 13, 1998
SHIELDED ROOM	KEENE 5983	N/A	N/A

2.2 TEST SETUP





2.3 CONDUCTED POWER LINE EMISSION LIMIT

FREQUENCY (MHz)	MAXIMUM RF LINE VOLTAGE (dB μ V)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56	56-46
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

2.4 TEST PROCEDURE

The test procedure is performed in a 12ft $\times$ 12ft $\times$ 8ft(L $\times$ W $\times$ H) shielded room. the EUT along with its peripherals were placed on a 1.0m(W) $\times$ 1.5m(L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane. The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chasis ground was bounded to the horizontal ground plane of shielded room. All peripherals were connected to the second LISN and the chasis ground also bounded to the horizontal ground plane of shielded room. The excess power cable between the EUT and the LISN was bundled. The power cables of peripherals were unbundled. All connecting cables of EUT and peripherals were moved to find the maximum emission.

2.5 UNCERTAINTY OF CONDUCTED EMISSION

The uncertainty of conducted emission is ± 1.36 dB.



2.6 LINE CONDUCTED RF VOLTAGE MEASUREMENT

The frequency spectrum from 0.15 MHz to 30 MHz was investigated. All emissions not reported below are more than 20 dB below the prescribed limits.

All readings are Quasi-peak values.

Temperature : 22 %

Humidity : 57 % RH

FREQUENCY (MHz)	READING(dB μ V)				LIMITS (dB μ V)	
	ONE END & GRD'D		THE OTHER END & GRD'D			
	Q.P.	Ave.	Q.P.	Ave.	Q.P.	Ave.
0.150	*	*	*	*	66.00	56.00
0.188	48.55	*	48.35	*	56.00	46.00
1.511	37.45	*	40.55	*	56.00	46.00
3.381	*	*	42.39	*	56.00	46.00
3.491	41.80	*	*	*	56.00	46.00
5.005	39.00	*	39.00	*	60.00	50.00
7.566	45.43	*	45.93	*	60.00	50.00
10.019	45.25	*	*	*	60.00	50.00
10.770	37.20	*	37.20	*	60.00	50.00
11.933	48.25	*	47.95	*	60.00	50.00
12.516	45.16	*	45.66	*	60.00	50.00
13.768	*	*	44.06	*	60.00	50.00
13.841	44.06	*	*	*	60.00	50.00
18.721	*	*	47.48	*	60.00	50.00
19.021	48.08	*	*	*	60.00	50.00
30.000	*	*	*	*	60.00	50.00

REMARKS : 1. * Undetectable or the Q.P.values is lower than the limits of Ave
2. For 10Mbps mode



2.6 LINE CONDUCTED RF VOLTAGE MEASUREMENT

The frequency spectrum from 0.15 MHz to 30 MHz was investigated. All emissions not reported below are more than 20 dB below the prescribed limits.

All readings are Quasi-peak values.

Temperature : 22 %

Humidity : 57 % RH

FREQUENCY (MHz)	READING(dB μ V)				LIMITS (dB μ V)	
	ONE END & GRD'D		THE OTHER END & GRD'D			
	Q.P.	Ave.	Q.P.	Ave.	Q.P.	Ave.
0.150	*	*	*	*	66.00	56.00
0.188	48.25	*	48.25	*	56.00	46.00
0.771	38.25	*	39.82	*	56.00	46.00
1.511	40.45	*	43.25	*	56.00	46.00
1.577	40.06	*	43.16	*	56.00	46.00
2.809	*	*	44.38	*	56.00	46.00
2.931	44.69	*	*	*	56.00	46.00
2.993	*	*	44.59	*	56.00	46.00
3.241	*	*	45.29	*	56.00	46.00
3.258	43.99	*	*	*	56.00	46.00
3.943	43.70	*	44.20	*	56.00	46.00
4.070	*	*	43.30	*	56.00	46.00
18.820	48.08	*	47.18	*	60.00	50.00
30.000	*	*	*	*	60.00	50.00

REMARKS : 1. * Undetectable or the Q.P.values is lower than the limits of Ave
2. For 100Mbps mode



3. RADIATED EMISSION TEST

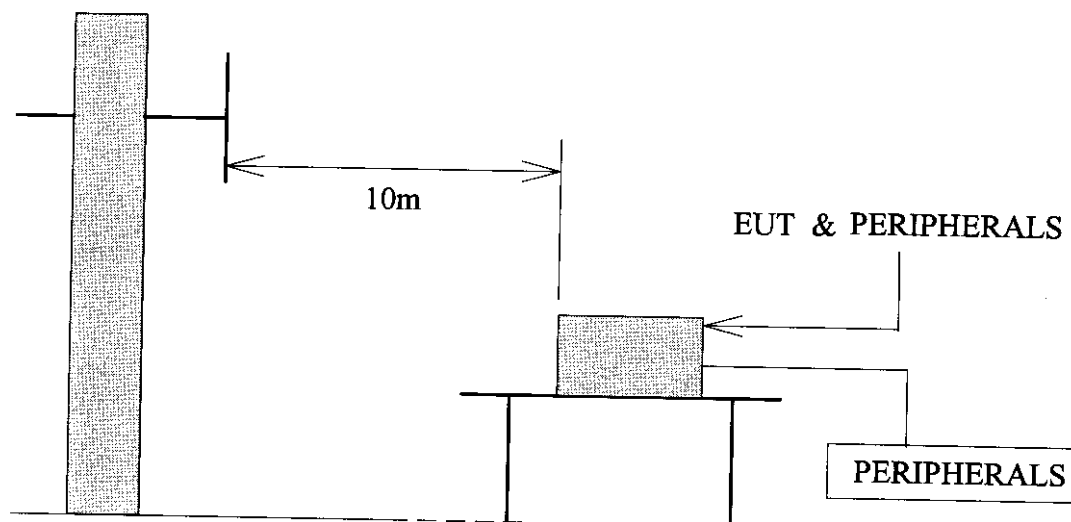
3.1 TEST EQUIPMENTS

The following test equipments are utilized in making the measurements contained in this report.

MANUFACTURER OR TYPE	MODEL No.	SERIAL No.	DATE OF CALIBRATION
CHASE BI-LOG ANTENNA	CBL6112B	2421	MAY. 18, 1998
R/S TEST RECEIVER	ESMI	842088/005 841978/008	MAY. 29, 1998
OPEN SITE	-----	No.2	AUG. 23, 1997

3.2 TEST SETUP

The diagram below shows the test setup which is utilized to make these measurements.



Antenna Elevation Variable



3.3 RADIATION LIMIT

All emanation from a class B computing device or system , including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below :

FREQUENCY (MHz)	DISTANCE (METERS)	FIELD STRENGTHS(dB μ V/M)	
		CLASS A	CLASS B
30 — 230	10	40	30
230 — 1000	10	47	37

Note : (1)The tighter limit shall apply at the edge between two frequency bands.

(2)Distance refers to the distance in meters between the measuring instrument antenna and the closest point of any part of the device or system.

3.4 TEST PROCEDURE

The devices under test were placed on a rotatable table top 0.8 meter above ground. The table was rotated 360 degrees to determine the position of the highest radiation. EUT is set 10 meters from the interference receiving antenna which is mounted on the top of a variable height mast. The antenna height is varied between one meter and four meters above ground to find the maximum value of the field strength Both horizontal polarization and vertical polarization of the antenna are set to make the measurement.

The bandwidth setting on the E.M.I. meter (R/S TEST RECEIVER ESMI) is 120 KHz.

The levels are quasi peak value readings. The frequency spectrum from 30MHz to 1000MHz was investigated.

3.5 UNCERTAINTY OF RADIATED EMISSION

The uncertainty of radiated emission is ± 2.72 dB.



3.6 RADIATED RF NOISE MEASUREMENT

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All emissions not reported below are more than 20 dB below the prescribed limits.

All readings are quasi-peak values.

Temperature : 27 °C

Humidity : 71 % RH

FREQ- UENCY (MHz)	ANTENNA FACTOR (dB)	CABLE LOSS (dB)	METER READING AT10m(dB μ V/M)		LIMITS (dB μ V/M)	EMISSION LEVEL AT10m(dB μ V/M)	
			HORIZON- TAL	VERTICAL		HORIZON- TAL	VERTICAL
30.00	*	*	*	*	30.00	*	*
160.00	11.08	3.00	10.08	*	30.00	24.16	*
200.00	10.19	3.40	13.72	7.28	30.00	27.31	20.87
220.00	11.25	3.56	9.24	*	30.00	24.05	*
225.00	11.51	3.60	7.84	*	30.00	22.95	*
250.00	12.83	3.80	11.20	5.04	37.00	27.83	21.67
275.00	13.21	4.00	10.64	3.36	37.00	27.85	20.57
450.00	17.21	5.10	9.80	3.36	37.00	32.11	25.67
480.00	17.58	5.28	11.48	8.40	37.00	34.34	31.26
500.00	17.83	5.40	13.16	7.56	37.00	36.39	30.79
510.00	17.90	5.45	12.32	7.00	37.00	35.67	30.35
520.00	17.97	5.50	11.48	10.08	37.00	34.95	33.55
550.00	18.19	5.65	5.60	*	37.00	29.44	*
560.00	18.26	5.70	5.04	5.32	37.00	29.00	29.28
650.00	18.81	6.15	5.60	4.20	37.00	30.56	29.16
730.00	19.42	6.55	3.64	*	37.00	29.61	*
750.01	19.65	6.65	7.00	8.68	37.00	33.30	34.98
799.97	20.23	6.90	3.08	*	37.00	30.21	*
820.00	20.31	6.98	2.52	*	37.00	29.81	*
850.00	20.43	7.10	5.04	5.32	37.00	32.57	32.85
870.01	20.52	7.18	6.44	5.32	37.00	34.14	33.02
900.01	20.64	7.30	3.64	*	37.00	31.58	*
910.00	20.71	7.34	2.80	4.76	37.00	30.85	32.81
920.01	20.78	7.38	3.08	*	37.00	31.24	*
1000.00	*	*	*	*	37.00	*	*

REMARKS : 1. * Undetectable

2. Emission level (dB μ V/M) = Antenna Factor (dB) + Cable loss (dB)
+ Meter Reading (dB μ V/M).

3. For 10Mbps mode



3.6 RADIATED RF NOISE MEASUREMENT

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All emissions not reported below are more than 20 dB below the prescribed limits.

All readings are quasi-peak values.

Temperature : 27 °C

Humidity : 71 % RH

FREQ- UENCY (MHz)	ANTENNA FACTOR (dB)	CABLE LOSS (dB)	METER READING AT 10m(dB μ V/M)		LIMITS (dB μ V/M)	EMISSION LEVEL AT 10m(dB μ V/M)	
			HORIZON- TAL	VERTICAL		HORIZON- TAL	VERTICAL
30.00	*	*	*	*	30.00	*	*
160.00	11.08	3.00	14.00	*	30.00	28.08	*
180.00	10.07	3.20	10.08	*	30.00	23.35	*
200.00	10.19	3.40	15.68	11.20	30.00	29.27	24.79
220.00	11.25	3.56	10.64	*	30.00	25.45	*
225.00	11.51	3.60	10.64	9.24	30.00	25.75	24.35
250.00	12.83	3.80	17.64	11.20	37.00	34.27	27.83
275.00	13.21	4.00	12.88	17.64	37.00	30.09	34.85
440.00	17.09	5.04	7.00	*	37.00	29.13	*
450.00	17.21	5.10	12.04	7.56	37.00	34.35	29.87
480.00	17.58	5.28	10.92	8.96	37.00	33.78	31.82
500.00	17.83	5.40	9.80	8.68	37.00	33.03	31.91
510.00	17.90	5.45	10.92	5.04	37.00	34.27	28.39
520.00	17.97	5.50	13.16	9.24	37.00	36.63	32.71
550.00	18.19	5.65	7.84	4.20	37.00	31.68	28.04
560.00	18.26	5.70	10.92	8.96	37.00	34.88	32.92
650.00	18.81	6.15	6.44	4.20	37.00	31.40	29.16
700.01	19.08	6.40	8.96	6.16	37.00	34.44	31.64
730.00	19.42	6.55	9.24	3.08	37.00	35.21	29.05
750.01	19.65	6.65	7.00	4.76	37.00	33.30	31.06
800.01	20.23	6.90	5.88	3.92	37.00	33.01	31.05
820.00	20.31	6.98	4.20	*	37.00	31.49	*
850.01	20.43	7.10	3.36	*	37.00	30.89	*
870.00	20.52	7.18	3.92	*	37.00	31.62	*
899.97	20.64	7.30	2.24	*	37.00	30.18	*
910.00	20.71	7.34	3.36	*	37.00	31.41	*
920.00	20.78	7.38	3.36	*	37.00	31.52	*
1000.00	*	*	*	*	37.00	*	*

REMARKS : 1. * Undetectable

2. Emission level (dB μ V/M) = Antenna Factor (dB) + Cable loss (dB)
+ Meter Reading (dB μ V/M).

3. For 100Mbps mode