

EXHIBIT 4
RFI/EMI TEST REPORT



EMC

TEST REPORT

REPORT NO. : F87091406

MODEL NO. : 19cx

DATE OF TEST : Oct. 31, 1998

PREPARED FOR : ARIESTEC INC.

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PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION



Accredited Laboratory

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TABLE OF CONTENTS

1. CERTIFICATION	3
2. GENERAL INFORMATION	4
2.1 GENERAL DESCRIPTION OF EUT	4
2.2 DESCRIPTION OF SUPPORT UNITS	5
2.3 TEST METHODOLOGY AND CONFIGURATION	5
3. TEST INSTRUMENTS	6
3.1 TEST INSTRUMENTS (EMISSION)	6
3.2 LIMITS OF CONDUCTED AND RADIATED EMISSION	7
4. TEST RESULTS (EMISSION)	8
4.1 RADIO DISTURBANCE	8
4.2 EUT OPERATION CONDITION	8
4.3 TEST DATA OF CONDUCTED EMISSION	9
4.4 TEST DATA OF RADIATED EMISSION	10
5. PHOTOGRAPHS OF THE TEST CONFIGURATION WITH MINIMUM MARGIN	12
6. ATTACHMENT I -TECHNICAL DESCRIPTION OF EUT	14



1.

CERTIFICATION

Issue Date: Nov. 17, 1998

Product : Color Monitor
Trade Name : ARIESTEC
Model No. : 19cx
Applicant : ARIESTEC, INC.
Standard : FCC Part 15, Subpart B, Class B
ANSI C63.4-1992
CISPR 22:1993+A1: 1995+A2: 1997

We hereby certify that one sample (19ci) of the designation has been tested in our facility on Oct. 31, 1998. The test record, data evaluation and Equipment Under Test (EUT) configurations represent herein are true and accurate representation of the measurements of the sample's EMC characteristics under the conditions herein specified.

The test results show that the EUT as described in this report is in compliance with the Class B limits of conducted and radiated emission of applicable standards.

TESTED BY: John Liao , DATE: 11/17/98
(John Liao)

CHECKED BY: Ariel Hsieh , DATE: 11/17/98
(Ariel Hsieh)

APPROVED BY: Mike Su , DATE: 11/17/98
(Mike Su)

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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	Color Monitor
Model No.	:	19cx
Power Supply Type	:	Switching
Power Cord	:	Nonshielded (1.8m)
Data Cable	:	Shielded (1.5m)

Note: The EUT is a 19" color monitor with resolution up to 1600x1200 (93.7 kHz).

The X in model: 19cx could be defined as A~Z, 0-9 or blank according to different customers' requirement.

Model: 19ci was selected as the representative during the test and therefore only its data is recorded in this report.

There are two ferrite cores on the video cable outside the monitor.

For more detailed features description, please refer to ATTACHMENT 1 - TECHNICAL DESCRIPTION OF EUT and User's Manual.



2.2 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories are used to form representative test configuration during the tests.

No.	Product	Brand	Model No.	FCC ID	I/O Cable
1	PERSONAL COMPUTER	NTI	PII-233T	DOC	Nonshielded Power (1.8m)
2	KEYBOARD	FORWARD	FDA-104GA	F4ZDA-104G	Shielded Signal (1.4m)
3	MOUSE	DEXIN	A2P800A	NIYA2P800A	Shielded Signal (1.5m)
4	PRINTER	HP	2225C+	DSI6XU2225	Shielded Signal (2.2m) Nonshielded Power (1.9m)
5	MODEM	ACEEX	1414	IFAXDM1414	Shielded Signal (1.2m) Nonshielded Power (1.9m)
6	VGA CARD	CARDEX	CD-GX2A44T	ICUVGA-GW710	N/A

2.3 TEST METHODOLOGY AND CONFIGURATION

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 3/10 m on an open area test site.

Please refer to the photos of test configuration in Item 5.



3. TEST INSTRUMENTS

3.1 TEST INSTRUMENTS (EMISSION)

RADIATED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	8594A	3144A00308	Sept. 3, 1999
HP Preamplifier	8447D	2944A08119	Jan. 20, 1999
HP Preamplifier	8347A	3307A01088	Sept. 9, 1999
ROHDE & SCHWARZ TEST RECEIVER	ESVP	893496/030	July 15, 1999
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 28, 1998
CHASE Bilog Antenna	CBL6112A	2329	Sept. 19, 1999
EMCO Turn Table	1060	1195	N/A
EMCO Tower	1051	1163	N/A
Open Field Test Site	Site 2	ADT-R02	Sept. 18, 1999

Note: 1. The measurement uncertainty is less than +/- 3dB, which is calculated as per NAMA's document NIS81.

2. The calibration interval of the above test instruments is 12 months.
And the calibrations are traceable to NML/ROC and NIST/USA.

CONDUCTED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ Test Receiver	ESH3	893495/006	July 15, 1999
ROHDE & SCHWARZ Spectrum Monitor	EZM	893787/013	July 16, 1999
ROHDE & SCHWARZ Artificial Mains Network	ESH3-Z5	839135/006	July 14, 1999
EMCO-L.I.S.N.	3825/2	9204-1964	July 14, 1999
Shielded Room	Site 2	ADT-C02	N/A

Note: 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMA's document NIS81.

2. The calibration interval of the above test instruments is 12 months.
And the calibrations are traceable to NML/ROC and NIST/USA.



3.2 LIMITS OF CONDUCTED AND RADIATED EMISSION

LIMIT OF RADIATED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 10m)
	dBuV/m	dBuV/m
30 - 230	40	30
230 - 1000	47	37

LIMIT OF RADIATED EMISSION OF FCC PART 15, SUBPART B FOR FREQUENCY ABOVE 1000 MHz

FREQUENCY (MHz)	Class A (at 10m)		Class B (at 3m)	
	uV/m	dBuV/m	uV/m	dBuV/m
Above 1000	300	49.5	500	54.0

- Note: (1) The lower limit shall apply at the transition frequencies.
- (2) Emission level (dBuV/m) = 20 log Emission level (uV/m).
- (3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

LIMIT OF CONDUCTED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

- Note: (1) The lower limit shall apply at the transition frequencies.
- (2) The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz
- (3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.



4. TEST RESULTS (EMISSION)

4.1 RADIO DISTURBANCE

Frequency Range : 0.15 - 30 MHz (Conducted Emission)
30 - 2000 MHz (Radiated Emission)
Input Voltage : 120 Vac, 60 Hz
Temperature : 25 °C
Humidity : 58 %
Atmospheric Pressure : 1002 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -8.4 dB at 0.186 MHz Minimum passing margin of radiated emission: -2.8 dB at 168.79 MHz

Note: The EUT was pretested under the following resolution & horizontal synchronization speed mode:

- * 1600x1200 mode (93.7 kHz),
- * 1280x1024 mode (91.0 kHz),
- * 640x480 mode (31.5 kHz)

The worst emission levels were found under 1600x1200 (93.7 kHz) and therefore the test data of only this mode is recorded

4.2 EUT OPERATION CONDITION

1. Turn on the power of all equipments.
2. PC runs a test program to enable all functions.
3. PC reads and writes messages from FDD and HDD.
4. PC sends "H" messages to monitor (EUT) and monitor displays "H" patterns on screen.
5. PC sends "H" messages to modem.
6. PC sends "H" messages to printer, and printer prints them on paper.
7. Repeat steps 3-7.



4.3 TEST DATA OF CONDUCTED EMISSION

EUT: **COLOR MONITOR**MODEL: **19ci**MODE: **1600x1200 (93.7 kHz)**

6 dB Bandwidth: 10 kHz

TEST PERSONNEL: *John Liao*

Freq.	L Level		N Level		Limit		Margin [dB (μV)]			
[MHz]	[dB (μV)]		[dB (μV)]		[dB (μV)]		L		N	
	QP	AV	QP	AV	QP	AV	QP	AV	QP	AV
0.186	55.80	-	54.30	-	64.21	54.21	-8.4	-	-9.9	-
0.279	48.20	-	47.70	-	60.83	50.83	-12.6	-	-13.1	-
0.467	44.30	-	43.20	-	56.56	46.56	-12.3	-	-13.4	-
0.935	41.10	-	44.60	-	56.00	46.00	-14.9	-	-11.4	-
3.795	35.90	-	36.10	-	56.00	46.00	-20.1	-	-19.9	-
11.997	41.00	-	42.80	-	60.00	50.00	-19.0	-	-17.2	-

- Remarks:
1. "": Undetectable
 2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 3. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 4. The emission levels of other frequencies were very low against the limit.
 5. Margin value = Emission level - Limit value



4.4 TEST DATA OF RADIATED EMISSION

EUT: **COLOR MONITOR**MODEL: **19ci**MODE: **1600x1200 (93.7 kHz)**POLARITY: **Horizontal**ANTENNA: **CHASE BILOG CBL6112A**
 DETECTOR FUNCTION AND BANDWIDTH: **Quasi peak, 120 kHz (30-1000 MHz)**
Peak, 1 MHz (1000 MHz-2000 MHz)
FREQUENCY RANGE: **30-1000 MHz**MEASURED DISTANCE: **10 M**FREQUENCY RANGE: **1000-2000 MHz**MEASURED DISTANCE: **3 M**TEST PERSONNEL: *John Liao*

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
50.64	10.1	12.6	22.7	30.0	-7.3
67.45	7.5	14.1	21.6	30.0	-8.4
84.38	9.1	9.4	18.5	30.0	-11.5
109.96	13.1	6.0	19.1	30.0	-10.9
118.15	14.1	10.0	24.1	30.0	-5.9
151.99	12.2	9.6	21.8	30.0	-8.2
168.79	11.4	15.1	26.5	30.0	-3.5
185.62	11.6	12.5	24.1	30.0	-5.9
202.64	12.1	14.9	27.0	30.0	-3.0
219.37	13.3	12.0	25.3	30.0	-4.7
236.14	14.5	13.7	28.2	37.0	-8.8
253.10	15.9	15.6	31.5	37.0	-5.5

REMARKS:

1. Emission level (dBuV/m) = Correction Factor (dB/m) + Meter Reading (dBuV).
2. Correction Factor (dB/m) = Ant. Factor (dB/m) + Cable loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value



TEST DATA OF RADIATED EMISSION

EUT: **COLOR MONITOR**MODEL: **19ci**MODE: **1600x1200 (93.7 kHz)**POLARITY: **Vertical**ANTENNA: **CHASE BILOG CBL6112A**

DETECTOR FUNCTION AND BANDWIDTH: **Quasi peak, 120 kHz (30-1000 MHz)**
Peak, 1 MHz (1000 MHz-2000 MHz)

FREQUENCY RANGE: **30-1000 MHz**MEASURED DISTANCE: **10 M**FREQUENCY RANGE: **1000-2000 MHz**MEASURED DISTANCE: **3 M**TEST PERSONNEL: **Jahn Liao**

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
33.47	17.0	6.5	23.5	30.0	-6.5
50.64	6.9	19.1	26.0	30.0	-4.0
67.46	6.5	20.5	27.0	30.0	-3.0
84.38	8.5	16.1	24.6	30.0	-5.4
109.76	12.4	6.9	19.3	30.0	-10.7
118.15	14.1	9.4	23.5	30.0	-6.5
151.98	12.6	12.5	25.1	30.0	-4.9
168.79	11.5	15.7	27.2	30.0	-2.8
185.66	11.7	14.3	26.0	30.0	-4.0
202.54	12.7	13.7	26.4	30.0	-3.6
219.34	13.5	12.6	26.1	30.0	-3.9
253.39	15.4	11.7	27.1	37.0	-9.9

REMARKS:

1. Emission level (dBuV/m) = Correction Factor (dB/m) + Meter Reading (dBuV).
2. Correction Factor (dB/m) = Ant. Factor (dB/m) + Cable loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value



6. ATTACHMENT I-TECHNICAL DESCRIPTION OF EUT

SPECIFICATIONS

Model	19ci
Screen	19CRT
Dot Pitch (mm)	0.25
Surface	Non-glare
Display Size	18"
Scanning Frequency	
Horizontal (kHz)	95
Vertical (Hz)	120
Max. Resolution	1600x1200
Band Width	150MHz
Compatibility	IBM, VGA, SVGA, 8514A, and VESA
Plug & Play	DDC1 & DDC2B
Display Colors	Unlimited
Signal Cable	Captive 15 pin, mini D-sub
Power	
Consumption	130
Supply	100-250Vac 50/60Hz
Power Management	Complies with EPA & VESA DPMS