FCC ID: FZY-CA-1768

EMC

TEST REPORT

REPORT NO. : F87041505
MODEL NO. : CA-1768
DATE OF TEST : April 28, 1998

PREPARED FOR : FAIR ELECTRONICS CO., LTD.

ADDRESS : NO. 9, WU-CHUN 7 RD. WU-KU IND. PARK,
TAIPEI HSIEN, TAIWAN, R.O.C.

PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION

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12F, NO.1, SEC.4, NAN-KING EAST RD.,
TAIPEI, TAIWAN, R.O.C.

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1. CERTIFICATION

Issue Date: May 6, 1998

Product	:	COLOR MONITOR
Trade Name	:	FAIR
Model No.	:	CA-1768
Applicant	:	FAIR ELECTRONICS CO., LTD.
Standard	:	FCC Part 15, Subpart B, Class B ANSI C63.4-1992 CISPR 22:1993+A1+A2

We hereby certify that one sample of the designation has been tested in our facility on April 28, 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: 5/6/98
(John Liao)

CHECKED BY: Sharon Hsiung , DATE: 5/6/98
(Sharon Hsiung)

APPROVED BY: Mike Su , DATE: 5/6/98
(Mike Su)

ADVANCE DATA TECHNOLOGY CORPORATION

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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	COLOR MONITOR
Model No.	:	CA-1768
Power Supply Type	:	Switching
Power Cord	:	Nonshielded (1.8m)
Data Cable	:	Shielded (1.8m)

Note: The EUT is a 17" color monitor with resolution up to 1280x1024

There is a ferrite core 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	HP	D4579A	DoC approved	Nonshielded Power (1.8m)
2	KEYBOARD	FORWARD	FDA-104GA	F4ZDA-104G	Shielded Signal (1.4m)
3	MOUSE	LOGITECH	M-S34	DZL210472	Shielded Signal (1.8 m)
4	PRINTER	HP	2225C+	DSI6XU2225	Shielded Signal (2.2 m) Nonshielded Power (1.9 m)
5	MODEM	DATATRONICS	1200CK	E2O5OV1200CK	Shielded Signal (1.2 m) Nonshielded Power (1.9 m)
6	VGA CARD	GORDIA	DSV3365	LUT-DSV3365	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 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. 1, 1998
HP Preamplifier	8447D	2944A08119	Aug. 2, 1998
ROHDE & SCHWARZ TEST RECEIVER	ESVP	893496/030	July 17, 1998
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 28, 1998
CHASE Bilog Antenna	CBL6112	2086	Dec. 26, 1998
EMCO Turn Table	1060	1195	N/A
EMCO Tower	1051	1163	N/A
Open Field Test Site	Site 2	ADT-R02	Sept. 26, 1998

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	ESHS30	828765/002	July 31, 1998
ROHDE & SCHWARZ Artificial Mains Network	ESH2-Z5	828075/003	July 28, 1998
EMCO-L.I.S.N.	3825/2	90031627	July 28, 1998
Shielded Room	Site 5	ADT-C05	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) dBuV/m	Class B (at 10m) 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 - 1000 MHz (Radiated Emission)
Input Voltage	:	120 Vac, 60 Hz
Temperature	:	25 ℃
Humidity	:	63 %
Atmospheric Pressure	:	1060 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -2.0 dB at 21.6905 MHz Minimum passing margin of radiated emission: -2.1 dB at 32.50 MHz

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

* 1280x1024 mode (64 kHz)
* 1024x768 mode (48 kHz),
* 640x480 mode (31.5 kHz),

The worst emission levels were found under 1280x1024 mode (64 kHz) and therefore the test data of only this mode is recorded.

4.1.1 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 the printer prints them on paper.
7. Repeat steps 3-7.

4.2 TEST DATA OF CONDUCTED EMISSION

EUT: **COLOR MONITOR** MODEL: **CA-1768**

MODE: **1280x1024 (64 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
0.151	47.50	-	47.60	-	65.90	55.90	-18.4	-	-18.3	-
0.257	36.80	-	36.60	-	61.53	51.53	-24.7	-	-24.9	-
0.642	28.60	-	25.80	-	56.00	46.00	-27.4	-	-30.2	-
4.992	27.60	-	24.10	-	56.00	46.00	-28.4	-	-31.9	-
21.690	54.10	48.00	53.90	47.60	60.00	50.00	-5.9	-2.0	-6.1	-2.4
30.000	32.80	-	30.40	-	60.00	50.00	-27.2	-	-29.6	-

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 level of other frequencies were very low against the limit.
5. Margin value = Emission level - Limit value

ADT CO. SITE 5

CISPR 22 CLASS B

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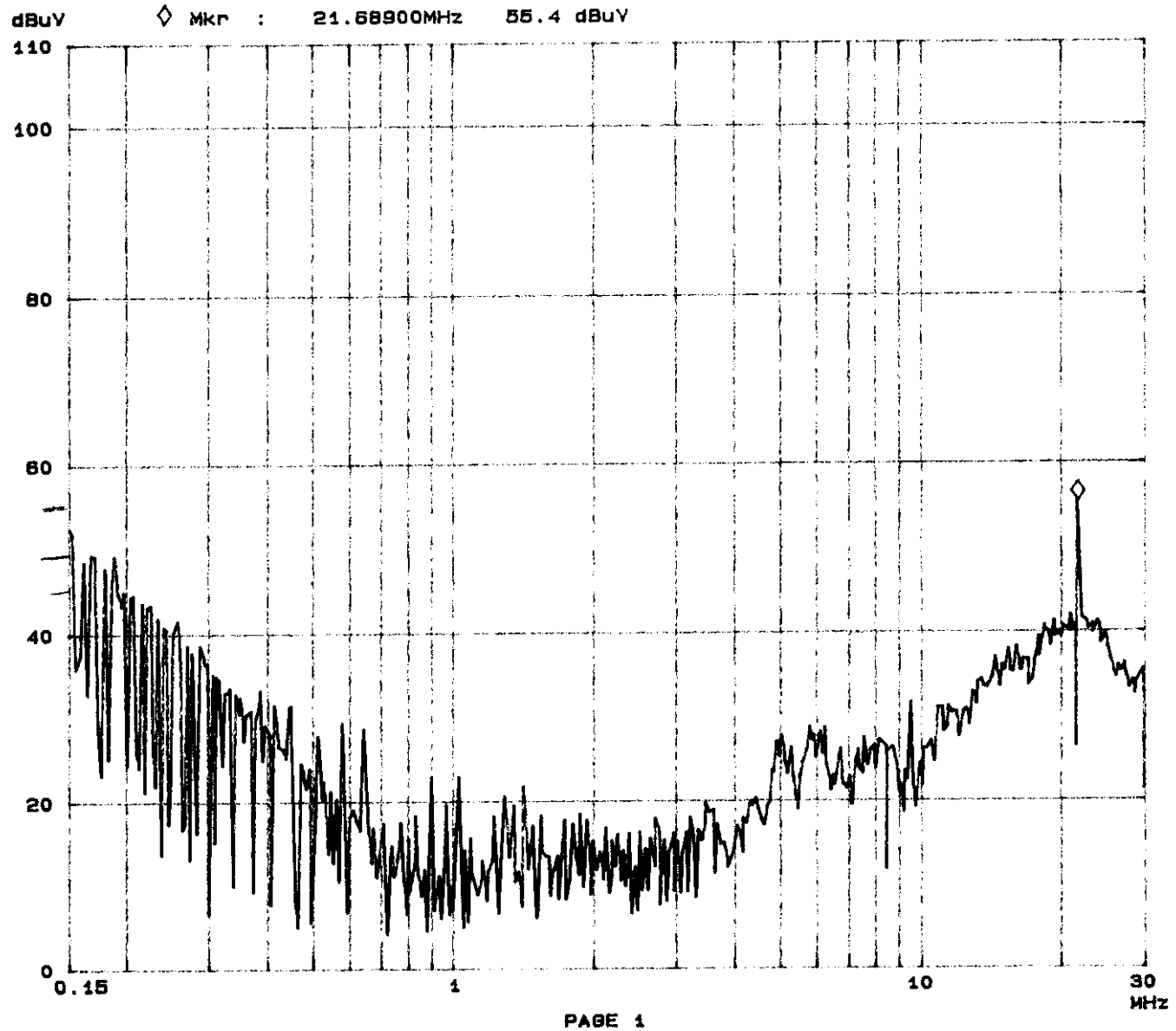
Tested by John Liao

EUT: MODEL: CA-1768
Op Cond: 1280X1024 64kHz
Test Spec: LISN : L
Comment: 120V AC / 60Hz
FULL SYSTEM

Fast Scan Settings (3 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	450k	3k	10k	PK	1ms	10dBLN	OFF	60dB
450k	5M	3k	10k	PK	1ms	10dBLN	OFF	60dB
5M	30M	3k	10k	PK	1ms	10dBLN	OFF	60dB



ADT CO. SITE 5
CISPR 22 CLASS B

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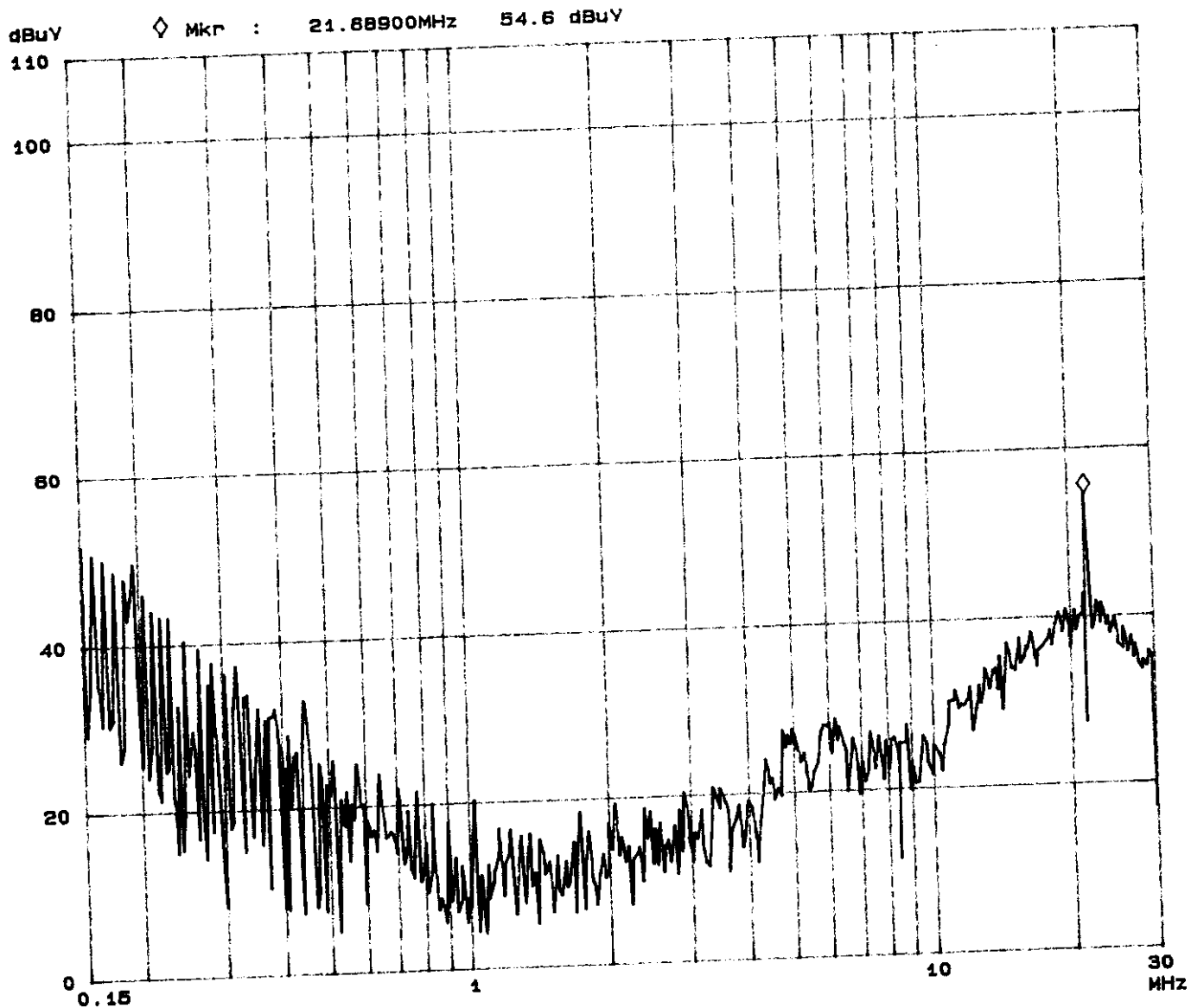
Tested by John Liao

EUT: MODEL: CA-1768
Op Cond: 1280X1024 64kHz
Test Spec: LISN : N
Comment: 120V AC / 60Hz
FULL SYSTEM

Fast Scan Settings (3 Ranges)			Receiver Settings					
Frequencies								
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	450k	3k	10k	PK	1ms	10dBLN	OFF	60dB
450k	5M	3k	10k	PK	1ms	10dBLN	OFF	60dB
5M	30M	3k	10k	PK	1ms	10dBLN	OFF	60dB



4.3 TEST DATA OF RADIATED EMISSION

EUT: **COLOR MONITOR** MODEL: **CA-1768**

MODE: **1280x1024 (64 kHz)**

ANTENNA: CHASE BILOG CBL6112 POLARITY: Horizontal

DETECTOR FUNCTION: Quasi-peak 6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz MEASURED DISTANCE: 10 M

TEST PERSONNEL: John Liao

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
54.15	9.3	14.5	23.8	30.0	-6.2
75.82	8.4	12.8	21.2	30.0	-8.8
86.65	9.9	14.8	24.7	30.0	-5.3
108.29	13.8	7.2	21.0	30.0	-9.0
129.95	14.6	5.7	20.3	30.0	-9.7
140.81	14.1	13.5	27.6	30.0	-2.4
162.47	12.4	10.6	23.0	30.0	-7.0
184.14	12.4	11.4	23.8	30.0	-6.2
194.97	13.0	10.7	23.7	30.0	-6.3
216.64	14.1	11.6	25.7	30.0	-4.3
227.48	14.6	12.8	27.4	30.0	-2.6

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: **CA-1768**

MODE: **1280x1024 (64 kHz)**

ANTENNA: CHASE BILOG CBL6112 POLARITY: Vertical

DETECTOR FUNCTION: Quasi-peak 6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz MEASURED DISTANCE: 10 M

TEST PERSONNEL: John Liao

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
32.50	17.9	10.0	27.9	30.0	-2.1
38.50	14.6	8.5	23.1	30.0	-6.9
43.33	12.5	14.3	26.8	30.0	-3.2
54.15	9.1	15.1	24.2	30.0	-5.8
75.82	7.6	14.2	21.8	30.0	-8.2
86.65	10.2	13.9	24.1	30.0	-5.9
108.30	12.8	10.2	23.0	30.0	-7.0
129.96	15.3	8.9	24.2	30.0	-5.8
140.81	15.1	10.7	25.8	30.0	-4.2
162.47	12.1	8.4	20.5	30.0	-9.5
184.13	12.8	10.7	23.5	30.0	-6.5
194.95	13.4	10.3	23.7	30.0	-6.3

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:

Picture Tube	17" diagonal, flat screen Tint glass, non-glare Medium short persistence phosphor (Anti-static surface treatment for MPR II model)	
Input Signal	Video: Analog, 0.7 Vpp/75 ohm positive Sync.: TTL, Separate, positive or negative	
Resolution	1280 x 1024 non-interlaced	
Scanning Frequency	Horizontal: 30~68 KHz Vertical : 50~100 Hz	
Video Bandwidth	85 MHz	
Power Saving	VESA DPMS	
Display Color	Unlimited (depending on the VGA card)	
Display Size	Horizontal: 300 +/- 2.5 mm (adjustable) Vertical : 225+/- 2.0 mm (adjustable)	
Power Input	Full range 110-120 Vac, 1.6 A (MAX.) 220-240 Vac, 0.8A (MAX.)	
Power Consumption	90 Watts (MAX.) 30 Watts max in-power-saving states	
Dimension	L x W x H	470 x 480 x 475 m/m 18.5 x 18.9 x 18.7 inches
Weight		15kg (28.6 lbs), net 17kg (33 lbs), gross
Environments	Operating	Temperature : +0~45 degree C Humidity : 30~80 %
	Storage	Temperature : -20~60 degree C Humidity : 10~90 %

ETC GROUP

FAIR ELECTRONICS CO., LTD.

NO.9, WU-CHUN 7 ROAD, WU-KU IND. PARK, TAIPEI HSIEN, TAIWAN, R.O.C.

TEL: 886-2-22981480,22981832,22981435 FAX: 886-2-22981131

Federal Communications Commission
Authorization and Evaluation Division
7435 Oakland Mills Rd.
Columbia, MD. 21046

Attention: Authorization and Evaluation Division

Subject: RFI related modifications incorporated into unit with - FCC ID: FZY-CA-1768 Date: June 1, 1998

Dear Sirs:

This letter serves as our declaration that all modifications listed below were implemented in the sample submitted for testing.We further declare that the same modifications will be implemented into all production units to enhance compliance of the units to FCC limits.

The modifications include the following:

1) Added two ferrite cores on the video cable, one outside the monitor and one inside the monitor. (see photo 2 & 8)

2) Added a metal cover on the rear side of CRT board and it was connected to chassis by three ground wires. On two ground wires a ferrite core was added, one with two turns and one with three turns. (see photo 4 & 5)

3) Added a ferrite core on the safety ground wires with three turns. (see photo 5)

4) Added a ferrite core on the harness of G2 and focus wires. (see photo 8)

5) Added a ferrite core on the degaussing wire with one turn. (see photo **7**)

6) Added two resistors, one bead core and two jump wires on the solder side of mainboard for EMI. They will be built into component side after circuit relayout. (see photo 9)

If you have any further questions or comments regarding the above, please don't hesitate to contact Mr. Johnson Ho of Spectrum Research and Testing Laboratory at (301) 855-2262.

Sincerely yours,

Joe Lin / Manager
FAIR ELECTRONICS CO., LTD.

cc. Mr. Johnson Ho - Spectrum Research and Testing Laboratory
Mr. Mike Su - Advance Data Technology Corporation.