



EMC

TEST REPORT

REPORT NO. : F89042022
MODEL NO. : 5Elr, 4V, 4Vlr, 5E
DATE OF TEST : May 12, 2000

PREPARED FOR : TOP VICTORY ELECTRONICS CO., LTD.

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TAIPEI HSIEN, TAIWAN, R.O.C.

PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION



Accredited Laboratory

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1.

CERTIFICATION

Issue Date: May 17, 2000

Product : 14", 15" COLOR MONITOR
 Trade Name : AOC
 Model No. : 5Elr, 4V, 4Vlr, 5E
 Applicant : TOP VICTORY ELECTRONICS CO., LTD.
 Standard : FCC Part 15, Subpart B, Class B
 CISPR 22: 1993+A1: 1995+A2: 1996, Class B
 ANSI C63.4-1992

We hereby certify that two samples of the designation have been tested in our facility on May 12, 2000. 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 : Arthur Lin , DATE: 5/17/2000
 (Arthur Lin)

CHECKED BY : Sharon Hsiung , DATE: 5/17/2000
 (Sharon Hsiung)

APPROVED BY : Mike Su , DATE: 5/17/2000
 (Mike Su)

ADVANCE DATA TECHNOLOGY CORPORATION

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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	14", 15" COLOR MONITOR
Model No.	:	5Elr, 4V, 4Vlr, 5E
Power Supply Type	:	Switching
Power Cord	:	Nonshielded (1.8 m, 3-pin)
Data Cable	:	Shielded (1.2 m)

Note: The EUT is a 14", 15" Color Monitor with resolution up to 1024x768.

The EUT has four model names, which are identical to each other except for their CRT size and tube:

- ◆ Model: 5Elr, CRT size: 15" with low radiation CRT
- ◆ Model: 4V, CRT size: 14" without low radiation CRT
- ◆ Model: 4Vlr, CRT size: 14" with low radiation CRT
- ◆ Model: 5E, CRT size: 15" without low radiation CRT

From the above model names, model: **4Vlr (mode 1)**, **5Elr (mode 2)** were selected as the representative for the test and their data is recorded in this report.

There is a ferrite core on the video cable outside both monitors.

For more detailed features description, please refer to manufacturer's specification or 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	PIII-450T	FCC DoC approved	Nonshielded Power (1.8 m)
2.	KEYBOARD	FORWARD	FDA-104GA	F4ZDA-104G	Shielded signal (1.4 m)
3.	MOUSE	LOGITECH	M-S43	DZL211106	Shielded signal (1.5 m)
4.	PRINTER	HP	2225C+	DSI6XU2225	Shielded Signal (1.4 m) Nonshielded Power (1.9 m)
5.	MODEM	ACEEX	1414	IFAXDM1414	Shielded signal (1.2 m) Nonshielded Power (1.9 m)
6.	VGA CARD	GORDIA	DSV3365V2	ICUVGA-GW710	NA

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)

CONDUCTED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ Test Receiver	ESH3	893495/006	July 7, 2000
ROHDE & SCHWARZ Spectrum Monitor	EZM	893787/013	July 8, 2000
ROHDE & SCHWARZ Artificial Mains Network	ESH3-Z5	839135/006	July 7, 2000
EMCO-L.I.S.N.	3825/2	9204-1964	July 7, 2000
Shielded Room	Site 2	ADT-C02	NA

Note: 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMAS 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.

RADIATED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	8590L	3544A01042	April 6, 2001
HP Preamplifier	8447D	2944A08313	Sept. 19, 2000
HP Preamplifier	8347A	3307A01088	Aug. 30, 2000
HP Preamplifier	8449B	3008A01201	Dec. 14, 2000
ROHDE & SCHWARZ TEST RECEIVER	ESVS 30	841977/008	Oct. 5, 2000
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 23, 2000
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Aug. 30, 2000
EMCO Double Ridged Guide Antenna	3115	9312-4192	March 29, 2001
CHASE BILOG Antenna	CBL6111A	1647	July 3, 2000
EMCO Turn Table	1016	1722	NA
EMCO Tower	1051	1825	NA
Open Field Test Site	Site 4	ADT-R04	June 11, 2000

Note: 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMAS 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

* Detector Function: Quasi-Peak

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

FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	Peak	Average	Peak	Average
Above 1000	80.0	60.0	74.0	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	:	23 Degree C
Humidity	:	81 %
Atmospheric Pressure	:	1000 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -5.9 dB at 19.532 MHz Minimum passing margin of radiated emission: -2.8 dB at 45.62, 52.14 MHz

Note: The EUT was pre-tested under the following resolution & horizontal synchronization speed mode:

- * 1024x768 mode (48 kHz)
- * 800x600 mode (54 kHz),
- * 640x480 mode (31.5 kHz)

The worst emission levels were found under 1024x768 (48 kHz) and therefore the test data of only this mode is recorded.

4.2 EUT OPERATION CONDITION

1. Turn on the power of all equipment.
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 then 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.



4.3 TEST DATA OF CONDUCTED EMISSION (A)

EUT: 14" COLOR MONITORMODEL: 4VlrMODE: 1024x768 (48 kHz)PHASE: LINE (L)6 dB Bandwidth: 10 kHz

Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
		[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.192	0.2	52.2	-	52.4	-	63.8	53.8	-11.4	-
0.241	0.2	46.4	-	46.6	-	59.2	49.2	-12.6	-
4.311	0.2	41.3	-	41.5	-	56.0	46.0	-14.5	-
9.015	0.7	47.3	36.5	48.0	37.2	56.0	46.0	-8.0	-8.8
13.039	1.0	45.7	-	46.7	-	60.0	50.0	-13.3	-
19.532	1.0	49.2	43.1	50.2	44.1	60.0	50.0	-9.8	-5.9

- Remarks:
1. "*": Undetectable
 2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 3. "-": The Quasi-peak emission level 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
 6. Emission Level = Correction Factor + Reading Value.



TEST DATA OF CONDUCTED EMISSION (A)

EUT: 14" COLOR MONITORMODEL: 4VlrMODE: 1024x768 (48 kHz)PHASE: NEUTRAL (N)6 dB Bandwidth: 10 kHz

Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.192	0.2	50.7	-	50.9	-	63.8	53.8	-12.9	-
0.241	0.2	45.0	-	45.2	-	59.2	49.2	-14.0	-
4.311	0.4	41.8	-	42.2	-	56.0	46.0	-13.8	-
9.015	0.6	47.7	37.0	48.3	37.6	56.0	46.0	-7.7	-8.4
13.039	0.8	46.4	-	47.2	-	60.0	50.0	-12.8	-
19.532	0.9	48.7	42.3	49.6	43.2	60.0	50.0	-10.4	-6.8

- Remarks:
1. "*": Undetectable
 2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 3. "-": The Quasi-peak emission level 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
 6. Emission Level = Correction Factor + Reading Value.



4.4 TEST DATA OF CONDUCTED EMISSION (B)

EUT: 15" COLOR MONITORMODEL: 5ELrMODE: 1024x768 (48 kHz)PHASE: LINE (L)6 dB Bandwidth: 10 kHz

Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
		[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.192	0.2	51.5	-	51.7	-	63.9	53.9	-12.2	-
0.339	0.2	40.9	-	41.1	-	59.2	49.2	-18.1	-
0.969	0.2	36.0	-	36.2	-	56.0	46.0	-19.8	-
4.023	0.4	42.2	-	42.6	-	56.0	46.0	-13.4	-
8.045	0.7	44.3	-	45.0	-	60.0	50.0	-15.0	-
10.178	0.7	43.4	-	44.1	-	60.0	50.0	-15.9	-
19.534	1.0	48.2	-	49.2	-	60.0	50.0	-15.9	-

- Remarks:
1. "*": Undetectable
 2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 3. "-": The Quasi-peak emission level 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
 6. Emission Level = Correction Factor + Reading Value.



TEST DATA OF CONDUCTED EMISSION (B)

EUT: 15" COLOR MONITORMODEL: 5ElrMODE: 1024x768 (48 kHz)PHASE: NEUTRAL (N)6 dB Bandwidth: 10 kHz

Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.192	0.2	50.3	-	50.5	-	63.9	53.9	-13.4	-
0.339	0.2	41.3	-	41.5	-	59.2	49.2	-17.7	-
0.969	0.2	38.3	-	38.5	-	56.0	46.0	-17.5	-
4.023	0.4	43.3	-	43.7	-	56.0	46.0	-12.3	-
8.045	0.6	45.6	-	46.2	-	60.0	50.0	-13.8	-
10.178	0.6	45.4	-	46.0	-	60.0	50.0	-14.0	-
19.534	0.9	47.9	-	48.8	-	60.0	50.0	-14.0	-

- Remarks:
1. "*": Undetectable
 2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 3. "-": The Quasi-peak emission level 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
 6. Emission Level = Correction Factor + Reading Value.



4.5 TEST DATA OF RADIATED EMISSION (A)

EUT: **14" COLOR MONITOR**

MODEL: **4Vlr**

MODE: **1024x768 (48 kHz)**

ANT. POLARITY: **Horizontal**

DETECTOR FUNCTION: **Quasi-peak**

6 dB BANDWIDTH: **120 kHz**

FREQUENCY RANGE: **30-1000 MHz**

MEASURED DISTANCE: **10 M**

Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
62.09	6.4	16.4	22.8	30.0	-7.2	400	294
112.50	12.0	10.4	22.4	30.0	-7.6	400	257
139.65	13.3	7.9	21.2	30.0	-8.8	400	77
164.85	11.7	10.5	22.2	30.0	-7.8	400	72
182.65	11.0	14.7	25.7	30.0	-4.3	400	321
208.40	10.9	8.1	19.0	30.0	-11.0	400	325
215.00	11.4	9.3	20.7	30.0	-9.3	400	300
228.01	12.4	11.5	23.9	30.0	-6.1	261	272

- REMARKS:
1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
 2. Correction Factor (dB) = Ant. Factor (dB)+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 (A)

EUT: 14" COLOR MONITORMODEL: 4VlrMODE: 1024x768 (48 kHz)ANT. POLARITY: VerticalDETECTOR FUNCTION: Quasi-peak6 dB BANDWIDTH: 120 kHzFREQUENCY RANGE: 30-1000 MHzMEASURED DISTANCE: 10 M

Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
45.62	13.0	14.2	27.2	30.0	-2.8	100	340
52.15	9.5	15.3	24.8	30.0	-5.2	100	6
73.82	7.6	15.0	22.6	30.0	-7.4	174	110
112.98	12.1	10.2	22.3	30.0	-7.7	100	332
136.55	13.1	10.8	23.9	30.0	-6.1	100	71
182.35	11.0	15.1	26.1	30.0	-3.9	100	352
208.40	10.9	9.4	20.3	30.0	-9.7	100	27
215.00	11.4	12.8	24.2	30.0	-5.8	100	98
228.13	12.4	10.3	22.7	30.0	-7.3	100	237

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



4.6 TEST DATA OF RADIATED EMISSION (B)

EUT: 15" COLOR MONITOR

MODEL: 5Elr

MODE: 1024x768 (48 kHz)

ANT. POLARITY: Horizontal

DETECTOR FUNCTION: Quasi-peak

6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz

MEASURED DISTANCE: 10 M

Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
52.18	9.5	15.1	24.6	30.0	-5.4	400	47
114.93	12.2	10.7	22.9	30.0	-7.1	400	13
136.40	13.1	8.9	22.0	30.0	-8.0	400	342
150.73	12.5	12.0	24.5	30.0	-5.5	400	64
182.33	11.0	8.4	19.4	30.0	-10.6	400	94
208.48	10.9	12.1	23.0	30.0	-7.0	400	282
215.00	11.4	13.0	24.4	30.0	-5.6	400	321
228.05	12.4	9.7	22.1	30.0	-7.9	400	346

- REMARKS:
1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
 2. Correction Factor (dB) = Ant. Factor (dB)+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 (B)

EUT: 15" COLOR MONITORMODEL: 5ElrMODE: 1024x768 (48 kHz)ANT. POLARITY: VerticalDETECTOR FUNCTION: Quasi-peak6 dB BANDWIDTH: 120 kHzFREQUENCY RANGE: 30-1000 MHzMEASURED DISTANCE: 10 M

Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
45.61	13.0	14.0	27.0	30.0	-3.0	100	2
52.14	9.5	17.7	27.2	30.0	-2.8	101	295
54.22	8.7	18.3	27.0	30.0	-3.0	101	19
73.64	7.6	16.4	24.0	30.0	-6.0	218	51
78.21	8.8	15.7	24.5	30.0	-5.5	202	312
118.71	12.4	14.4	26.8	30.0	-3.2	100	259
136.50	13.1	11.4	24.5	30.0	-5.5	100	60
182.40	11.0	13.7	24.7	30.0	-5.3	100	357
208.45	10.9	11.9	22.8	30.0	-7.2	100	355
215.00	11.4	13.8	25.2	30.0	-4.8	100	346

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



**5. PHOTOGRAPHS OF THE TEST CONFIGURATION WITH
MINIMUM MARGIN**

CONDUCTED EMISSION TEST (Mode: 1)



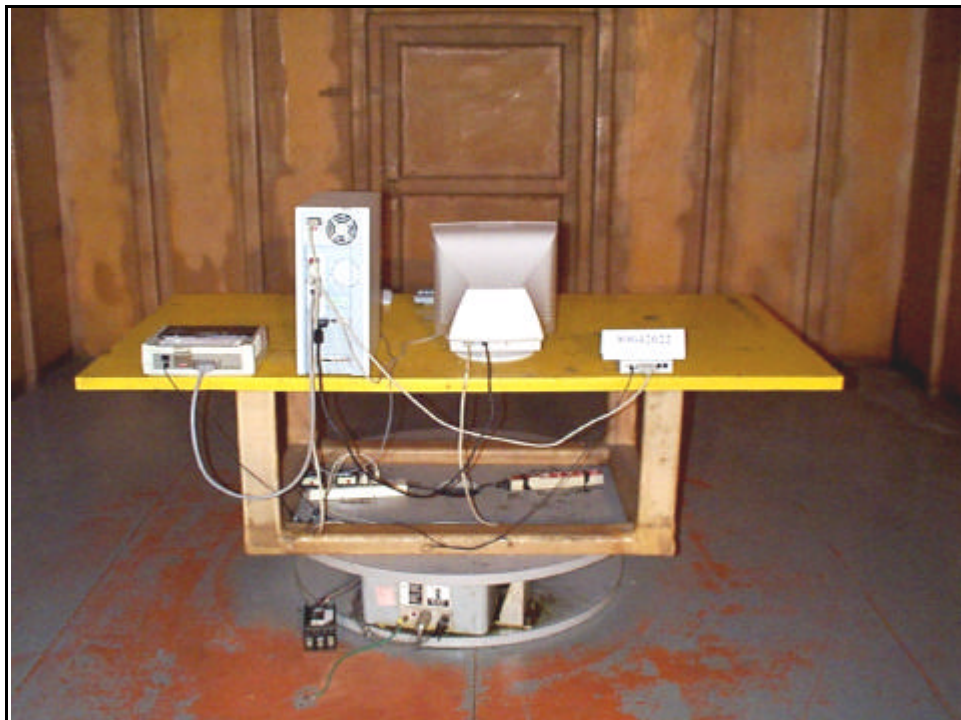


CONDUCTED EMISSION TEST (Mode: 2)





RADIATED EMISSION TEST (Mode 1)





RADIATED EMISSION TEST (Mode 2)





6. APPENDIX - INFORMATION OF THE TESTING LABORATORY

Information of the testing laboratory

We, ADT Corp., are founded in 1988, to provide our best service in EMC and Safety consultation. Our laboratory is accredited by the following approval agencies according to ISO/IEC Guide 25 or EN 45001:

- | | |
|---------------|--------------------------------------|
| ● USA | FCC, UL, NVLAP |
| ● Germany | TUV Rheinland
TUV Product Service |
| ● Japan | VCCI |
| ● New Zealand | RFS |
| ● Norway | NEMKO, DNV |
| ● U.K. | INCHCAPE |
| ● R.O.C. | BSMI |

Enclosed please find some certificates of our laboratory obtained from approval agencies. If you have any comments, please feel free to contact us with the following:

Lin Kou EMC Lab.:
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Fax: 886-2-26022943

Hsin Chu EMC Lab:
Tel: 886-35-935343
Fax: 886-35-935342

Lin Kou Safety Lab.:
Tel: 886-2-26093195
Fax: 886-2-26093184

Design Center:
Tel: 886-2-26093195
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