

FCC TEST REPORT

for

CISPR PUB. 22 Class B

Equipment : Monitor
Model No. : 15T
FCC ID : NPU15T
Filing Type : Certification
Applicant : **ARISTEC, INC.**
3FL., NO. 100, MIN-CHUAN ROAD,
HSIN TIEN CITY, TAIPEI, TAIWAN, R.O.C.

- The test result refers exclusively to the test presented test model / sample.
- Without the written authorization of the test lab., the Test Report may not be copied.

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

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CERTIFICATE OF COMPLIANCE

for

CISPR PUB. 22 Class B

Equipment : Monitor

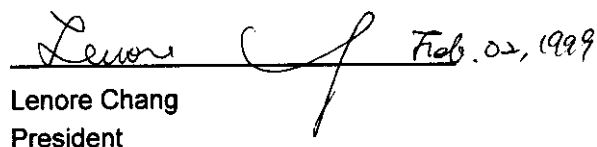
Model No. : 15T

FCC ID : NPU15T

Applicant : **ARISTEC, INC.**
3FL., NO. 100, MIN-CHUAN ROAD,
HSIN TIEN CITY, TAIPEI, TAIWAN, R.O.C.

HEREBY CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4 - 1992** and the energy emitted by this equipment was **passed CISPR PUB. 22** both radiated and conducted emission class B limits. Testing was carried out on Jan. 18, 1999 at **SPORTON International Inc. LAB.** in Lin Kou.


Lenore Chang
President

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

1. General Description of Equipment under Test

1.1. Applicant

ARIESTEC, INC.
3FL., NO. 100, MIN-CHUAN ROAD,
HSIN TIEN CITY, TAIPEI, TAIWAN, R.O.C.

1.2. Manufacturer

Same as 1.1.

1.3. Basic Description of Equipment under Test

Equipment	: Monitor
Model No.	: 15T
FCC ID	: NPU15T
Trade Name	: ARIESTEC
VGA DATA CABLE	: Double-Shielded
USB DATA CABLE	: Double-Shielded
Power Supply Type	: Switching
Power Cord	: Non-Shielded

1.4. Feature of Equipment under Test

- CRT :
 - Size (Display Size) : 15.0" TFT.
- Input :
 - Video Signal : 0.7Vp-p Analog (75ohm).
- Scanning frequency :
 - Horizontal : 31.5-60KHz.
 - Vertical : 60-75Hz.
- Resolution : 1024 x 768 @75Hz.
- Video bandwidth : 75MHz.
- Power supply : AC/DC Adapter 100-250V, 50/60Hz.
- Power management : 8W (off mode).
- External connections : 15 pin D-sub.
- Special function : Speaker 1W x 2, Earphone, USB HUB (Option).

2. Test Configuration of Equipment under Test

2.1. Test Manner

- a. The EUT has been associated with personal computer and peripherals pursuant to ANSI C63.4-1992 and configuration operated in a manner which tended to maximize its emission characteristics in a typical application.
- b. The DELL PS/2 Keyboard, four WINIC USB Mouse, HP Printer, ACEEX Modem, AIWA Stereo Cassette Player, J&S Earphone, JOYTECH VGA card and EUT were connected to the FIC PC for EMI test.
- c. The Following display resolution were investigated during the compliance test:
 1. Horizontal frequency (640x480 to 1,024x768, 31.5 KHz to 60 KHz)
 2. Vertical frequency (60 Hz to 75 Hz)
- d. According to the above tests, we listed the following display modes as the worst cases:
 1. 1,024x768 (non-interlanced 60 KHz), refresh rate 75 Hz.
 2. 800x600 (non-interlanced 48 KHz), refresh rate 72 Hz.
- e. Frequency range investigated: conduction 150 KHz to 30 MHz, radiation 30 MHz to 1,000 MHz.

2.2. Description of Test System

Support Unit 1. -- PS/2 Keyboard (DELL)

FCC ID : GYUM92SK
Model No. : AT101(DE8M)
Power Supply Type : N/A
Serial No. : SP0054
Data Cable : Shielded, 360 degree via metal backshells, 1.9m

Support Unit 2. -- USB Mouse (WINIC)

FCC ID : F4ZFDM-A50
Model No. : FDM-A50
Serial No. : SP0092
Data Cable : Shielded, 1.5m

Support Unit 3. -- Printer (HP)

FCC ID : B94C2642X
Model No. : DeskJet 400
Power Supply Type : Linear
Serial No. : SP0048
Data Cable : Shielded, 360 degree via metal backshells, 1.35m

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Support Unit 4. -- Modem (ACEEX)

FCC ID : IFAXDM1414
Model No. : DM1414
Power Supply Type : Linear
Power Cord : N/A
Serial No. : SP0059
Data Cable : Shielded, 360 degree via metal backshells, 1.15m

Support Unit 5. -- Stereo Cassette Player (AIWA)

FCC ID : N/A
Model No. : HS-J36
Power Supply Type : Linear
Power Cord : N/A
Serial No. : SP0032
Data Cable : Non-Shielded

Support Unit 6. -- Earphone (J&S)

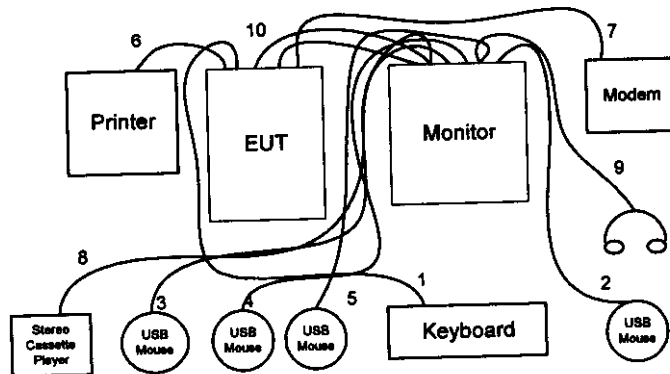
FCC ID : N/A
Model No. : HS-102
Serial No. : SP0123
Data Cable : Non-Shielded, 1.2m

Support Unit 7. -- VGA card (Joytech)

FCC ID : JDF-765PCI-001
Model No. : 988
Serial No. : SP0069
Data Cable : Shielded, 1.7m

Support Unit 8. -- Personal Computer (FIC)

FCC ID : N/A
Model No. : P2L97
Power Supply Type : Switching
Power Cord : Non-Shielded
Serial No. : SP0006
Data Cable : Shielded
Remark : This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

2.3. Connection Diagram of Test System

1. The I/O cable is connected from PC to the support unit 1.
2. The I/O cable is connected from EUT to the support unit 2.
3. The I/O cable is connected from EUT to the support unit 2.
4. The I/O cable is connected from EUT to the support unit 2.
5. The I/O cable is connected from EUT to the support unit 2.
6. The I/O cable is connected from PC to the support unit 3.
7. The I/O cable is connected from PC to the support unit 4.
8. The I/O cable is connected from EUT to the support unit 5.
9. The I/O cable is connected from EUT to the support unit 6.
10. The I/O cables(VGA and USB) are connected from EUT to the support unit 7.

4. General Information of Test

4.1. Test Facility

This test was carried out by SPORTON International Inc. in an openarea test site.
Openarea Test Site Location : No. 30-2, Lin 6, Diing-Fwu Tsuen, Lin-Kou-Hsiang,
Taipei Hsien, Taiwan, R.O.C.
TEL : 886-2-2601-1640
FAX : 886-2-2601-1695

4.2. Standard for Methods of Measurement

ANSI C63.4-1992

4.3. Test in Compliance with

CISPR PUB. 22 Class B

4.4. Frequency Range Investigated

- a. Conduction: from 150 kHz to 30 MHz
- b. Radiation : from 30 MHz to 1,000 MHz

4.5. Test Distance

The test distance of radiated emission from antenna to EUT is 10 M.

5. Test of Conducted Powerline

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 115 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4-1992 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 5.3. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

5.1. Major Measuring Instruments

Test Receiver	HP 8591EM
Attenuation	0 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
Step MHz	0.007 MHz
IF Bandwidth	9 kHz

5.2. Test Procedures

- a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- c. All the support units are connect to the other LISN.
- d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- e. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
- f. Both sides of AC line were checked for maximum conducted interference.
- g. The frequency range from 150 kHz to 30 MHz was searched.
- h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- i. If the emission level of the EUT in peak mode was 6 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 6 dB margin will be retested one by one using the quasi-peak method and reported.

5.4. Test Result of AC Powerline Conducted Emission

5.4.1. Test mode : 1024x768 60K/75Hz

- Temperature : 18°C
- Relative Humidity : 78 %
- Test Date : Jan. 18, 1999

The Conducted Emission test was passed at minimum margin

LINE 23.999 MHz / 47.70 dBuV.

Freq. (MHz)	Line or Neutral	Meter Reading				Limits				Margin	
		Q.P. (dBuV)	A.V. (dBuV)	Q.P. (uV)	A.V. (uV)	Q.P. (dBuV)	A.V. (dBuV)	Q.P. (uV)	A.V. (uV)	Q.P. (dB)	A.V. (dB)
0.249	L	46.80	40.70	218.78	108.39	63.17	53.17	1440.69	455.59	-16.37	-12.47
0.994	L	39.70	38.50	96.61	84.14	56.00	46.00	630.96	199.53	-16.30	-7.50
4.098	L	39.70	35.80	96.61	61.66	56.00	46.00	630.96	199.53	-16.30	-10.20
23.999	L	47.70	45.80	242.66	194.98	60.00	50.00	1000.00	316.23	-12.30	-4.20
0.249	N	47.60	41.60	239.88	120.23	63.17	53.17	1440.69	455.59	-15.57	-11.57
23.999	N	47.50	45.50	237.14	188.36	60.00	50.00	1000.00	316.23	-12.50	-4.50

Test Engineer :

Kenny Chuang
KENNY CHUANG

5.4.2. Test mode : 800x600 48K/72Hz

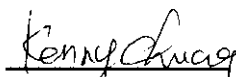
- Temperature : 18°C
- Relative Humidity : 78 %
- Test Date : Jan. 18, 1999

The Conducted Emission test was passed at minimum margin

LINE 23.999 MHz / 47.70 dBuV.

Freq. (MHz)	Line or Neutral	Meter Reading				Limits				Margin	
		Q.P. (dBuV)	A.V. (dBuV)	Q.P. (uV)	A.V. (uV)	Q.P. (dBuV)	A.V. (dBuV)	Q.P. (uV)	A.V. (uV)	Q.P. (dB)	A.V. (dB)
0.248	L	46.60	40.70	213.80	108.39	63.20	53.20	1445.44	457.09	-16.60	-12.50
1.676	L	39.80	38.60	97.72	85.11	56.00	46.00	630.96	199.53	-16.20	-7.40
3.973	L	39.80	34.30	97.72	51.88	56.00	46.00	630.96	199.53	-16.20	-11.70
23.999	L	47.70	45.90	242.66	197.24	60.00	50.00	1000.00	316.23	-12.30	-4.10
0.248	N	46.40	41.40	208.93	117.49	63.20	53.20	1445.44	457.09	-16.80	-11.80
23.999	N	47.70	45.90	242.66	197.24	60.00	50.00	1000.00	316.23	-12.30	-4.10

Test Engineer :


KENNY CHUANG

6. Test of Radiated Emission

Radiated emissions from 30 MHz to 1,000 MHz were measured with a bandwidth of 120 kHz according to the methods defines in ANSI C63.4-1992. The EUT was placed on a nonmetallic stand in the open-field site, 0.8 meter above the ground plane, as shown in section 6.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

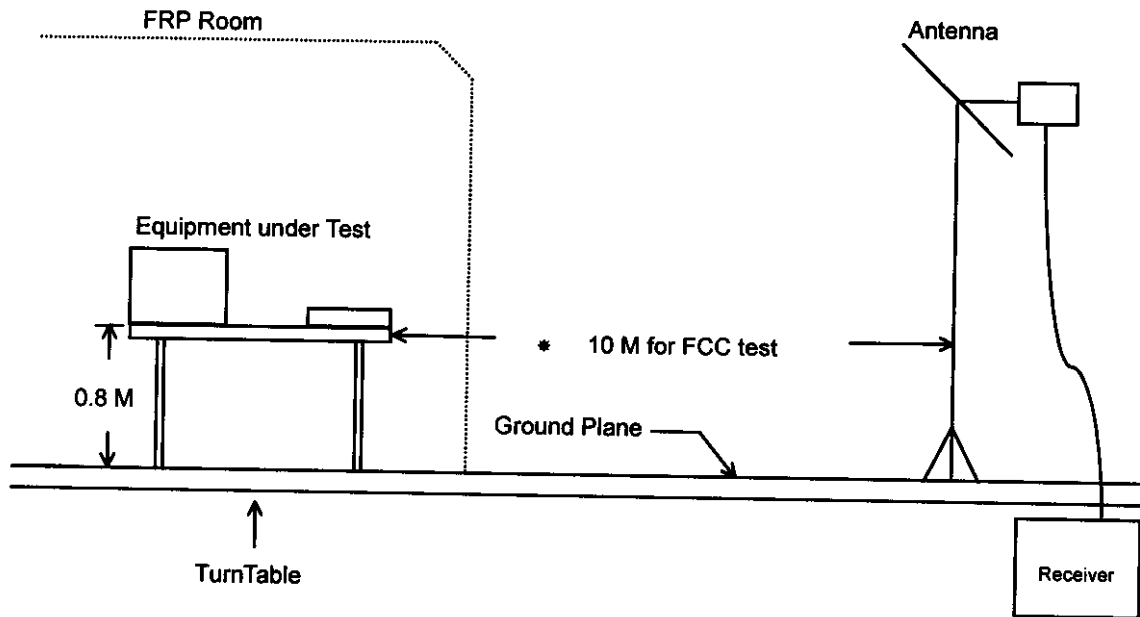
6.1. Major Measuring Instruments

Amplifier	(HP 8447D)
Attenuation	0 dB
RF Gain	25 dB
Signal Input	0.1 MHz to 1.3 GHz
Spectrum Analyzer	(HP 8568B)
Attenuation	0 dB
Start Frequency	30 MHz
Stop Frequency	1,000 MHz
Resolution Bandwidth	1 MHz
Video Bandwidth	1 MHz
Signal Input	100 Hz to 1.5 GHz
Quasi-Peak Adapter	(85650A)
Resolution Bandwidth	120 KHz
Frequency Band	30 MHz to 1 GHz
Quasi-Peak Detector	ON for Quasi-Peak Mode OFF for Peak Mode

6.2. Test Procedures

- a. The EUT was placed on a rotatable table top 0.8 meter above ground.
- b. The EUT was set 10 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The antenna is a half wave dipole and its 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.
- e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- f. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 6 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 6 dB margin will be repeated one by one using the quasi-peak method and reported.

6.3. Typical Test Setup Layout of Radiated Emission



6.4. Test Result of Radiated Emission**6.4.1. Test mode : 1024x768 60K/75Hz**

- Test Distance : 10 M
- Temperature : 15°C
- Relative Humidity : 81 %
- Test Date : Jan. 14, 1999
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Antenna Factor + Cable Loss + Reading = Emission

The Radiated Emission test was passed at minimum margin

464.000 MHz / 33.85 dBuV (VERTICAL) Antenna Height 2.8 Meter, Turntable Degree 149 °

Frequency (MHz)	Polarity	Antenna Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Limits		Emission (dBuV)	Level (uV)	Margin (dB)
					(dBuV)	(uV)			
47.994	V	9.08	1.12	15.98	30.00	31.62	26.18	20.37	-3.82
464.000	V	16.68	3.50	13.67	37.00	70.79	33.85	49.26	-3.15
479.200	V	16.78	3.50	12.99	37.00	70.79	33.27	46.08	-3.73
667.200	V	18.38	4.37	10.89	37.00	70.79	33.64	48.08	-3.36
191.966	H	9.14	2.30	14.65	30.00	31.62	26.09	20.16	-3.91
227.200	H	10.87	2.50	12.99	30.00	31.62	26.36	20.80	-3.64

Test Engineer :

Terry Chang
Terry Chang

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6.4.2. Test mode : 800x600 48K/72Hz

- Test Distance : 10 M
- Temperature : 15°C
- Relative Humidity : 81 %
- Test Date : Jan. 14, 1999
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Antenna Factor + Cable Loss + Reading = Emission

The Radiated Emission test was passed at minimum margin**48.000 MHz / 26.58 dBuV (VERTICAL) Antenna Height 1 Meter, Turntable Degree 79 °.**

Frequency (MHz)	Polarity	Antenna Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Limits		Emission (dBuV)	Level (uV)	Margin (dB)
					(dBuV)	(uV)			
48.000	V	9.08	1.12	16.38	30.00	31.62	26.58	21.33	-3.42
176.547	V	9.54	2.23	13.58	30.00	31.62	25.35	18.51	-4.65
438.400	V	16.53	3.50	12.51	37.00	70.79	32.54	42.36	-4.46
450.400	V	16.60	3.50	12.14	37.00	70.79	32.24	40.93	-4.76
487.577	V	16.83	3.50	12.70	37.00	70.79	33.03	44.82	-3.97
487.560	H	16.83	3.50	13.10	37.00	70.79	33.43	46.94	-3.57

Test Engineer :

Terry Chang
Terry Chang

7. Antenna Factor & Cable Loss

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)
30	18.2	1.0
35	16.2	1.0
40	14.0	1.2
45	10.7	1.0
50	8.0	1.2
55	6.7	1.2
60	5.4	1.2
65	5.6	1.3
70	5.7	1.3
75	6.4	1.3
80	7.2	1.3
85	8.3	1.5
90	9.4	1.5
95	10.4	1.5
100	11.4	1.5
110	11.7	1.7
120	11.9	1.7
130	11.7	1.7
140	11.2	2.0
150	10.7	2.2
160	10.2	2.2
170	9.8	2.3
180	9.4	2.2
190	9.2	2.3
200	8.9	2.3
220	10.4	2.5
240	11.7	2.5
260	12.6	2.6
280	12.9	2.7
300	13.2	2.8
320	13.8	2.8
340	14.4	3.1
360	15.0	3.3
380	15.7	3.4
400	16.3	3.5
450	16.6	3.5
500	16.9	3.5
550	18.8	3.8
600	18.0	4.7
650	18.1	4.2
700	18.9	4.7
750	19.5	4.8
800	20.2	5.0
850	20.8	5.2
900	20.7	5.3
950	21.0	5.8
1000	21.2	5.8

8. List of Measuring Equipments Used

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver (site 2)	HP	8591EM	3710A01187	9 KHz - 18 GHz	Sep. 18, 1998	Conduction
LISN (EUT) (site 2)	Telemeter	NNB-2/16Z	98009	50 ohm / 50 uH	Jan. 22, 1999	Conduction
LISN (Support Unit) (site 2)	EMCO	3810/2NM	9703-1839	50 ohm / 50 uH	Jul. 06, 1998	Conduction
Quasi-peak Adapter (site 5)	HP	85650A	2521A00821	9KHz -1 GHz	Nov. 14, 1998	Radiation
Spectrum Analyzer (Site 5)	HP	8568B	2634A03000	100Hz - 1.5GHz	Nov. 14, 1998	Radiation
Amplifier (Site 5)	HP	8447D	2944A08290	0.1MHz -1.3GHz	Nov. 13, 1998	Radiation
Bilog Antenna (Site 5)	CHASE	CBL6112A	2287	30MHz -2GHz	Jan. 27, 1998	Radiation
Half-wave dipole antenna (Site 5)	EMCO	3121C	9705-1285	28 M - 1GHz	May 19, 1998	Radiation
Turn Table (site 5)	EMCO	2080	9711-2021	0 ~ 360 degree	N/A	Radiation

5.3. Typical Test Setup Layout of Conducted Powerline

