CE

SPORTON LAB.

Certificate No: C971417-03

CERTIFICATE

EQUIPMENT : AC/DC Adapter
MODEL NO. : GT-21131
APPLICANT : GLOBTEK INC.
186 VETERANS DR NORTHVALE NJ 07647

SPORTON LAB.

CERTIFY THAT:

THE MEASUREMENTS SHOWN IN THIS TEST REPORT WERE MADE IN ACCORDANCE WITH THE PROCEDURES GIVEN IN **EUROPEAN COUNCIL DIRECTIVE 89/336/EEC.** THE EQUIPMENT WAS **PASSED** THE TEST PERFORMED ACCORDING TO **EUROPEAN STANDARD EN55022:1994/A1:1995/A2:1997 Class B, EN61000-3-2:1995, EN61000-3-3:1995 and EN50082-1:1997 (EN61000-4-2:1995, EN61000-4-3:1996, EN61000-4-4:1995).** THE TEST WAS CARRIED OUT ON **Jul. 15, 1999** AT **SPORTON INTERNATIONAL INC.** LAB.

K. J. Lin
Manager

CE TEST REPORT

according to

European Standard EN55022:1994/A1:1995/A2:1997 Class B
EN61000-3-2:1995, EN61000-3-3:1995
and EN50082-1:1997
EN61000-4-2:1995, EN61000-4-3:1996, EN61000-4-4:1995

Equipment : AC/DC Adapter

Model No. : GT-21131

Applicant : **GLOBTEK INC.**
186 VETERANS DR NORTHVALE NJ 07647

- The test result refers exclusively to the test presented test model / sample.
- Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

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

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History of this test report

Original Report Issue Date: Mar. 29, 2002

■ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

Certificate No. : C971417-03

CERTIFICATE OF COMPLIANCE

according to

European Standard EN55022:1994/A1:1995/A2:1997 Class B EN61000-3-2:1995, EN61000-3-3:1995 and EN50082-1:1997 EN61000-4-2:1995, EN61000-4-3:1996, EN61000-4-4:1995

Equipment : AC/DC Adapter

Model No. : GT-21131

Applicant : **GLOBTEK INC.**
186 VETERANS DR NORTHVALE NJ 07647

I **HEREBY** CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **EUROPEAN COUNCIL DIRECTIVE 89/336/EEC.** The equipment was ***passed*** the test performed according to **European Standard EN55022:1994/A1:1995/A2:1997 Class B and EN61000-3-2:1995, EN61000-3-3:1995 and EN50082-1:1997 (EN61000-4-2:1995, EN61000-4-3:1996, EN61000-4-4:1995).** The test was carried out on Jul. 15, 1999 at **SPORTON International Inc.** LAB. in Lin Kou.

Apr. 01, 2002

K. J. Lin
Manager

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

GLOBTK INC.
186 VETERANS DR NORTHVALE NJ 07647

1.2. Manufacturer

Same as 1.1.

1.3. Basic Description of Equipment under Test

Equipment	: AC/DC Adapter
Model No.	: GT-21131
Trade Name	: GLOBTEK
Power Supply Type	: Switching
Power input cable	: Non-Shielded,1.7m, 3 pin
Power output cable	: Non-Shielded,1.5m, 4 pin

1.4. Feature of Equipment under Test

- IMPUT: 100-240Vac, 1.2A MAX, 47-63Hz
- OUTPUT: +12Vdc/5.0A

2. Test Configuration of Equipment under Test

2.1. Test Manner

a. During testing, the interface cables and equipment positions were varied according to European Standard EN 55022.
b. The Dummy Load was connected to the EUT for EMI test.
c. The Dummy Load and BROTHER Multi-meter were connected to the EUT for EMS test.
d. Frequency range investigated: conduction 150 KHz to 30 MHz, radiation 30 MHz to 1000MHz.

2.2. Description of Test System

< EMI >

Support Unit 1. – Dummy Load
Spc. : 2.4 ohm (300W)

< EMS >

Support Unit 1. – Dummy Load
Spc. : 2.4 ohm (300W)

Support Unit 2. – Multi-meter (Brother)
Model. : YH-370

3. Test Software

No test software was used during testing.

4. General Information of Test

4.1. Test Facility

This test was carried out by SPORTON International Inc.

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

EMI Test (conduction and radiation)	: European Standard EN 55 022 Class B.
Harmonics Test	: European Standard EN 61000-3-2.
Voltage Fluctuations Test	: European Standard EN 61000-3-3.
EMS Test (ESD, RS and EFT)	: EN 50 082-1:1997 EN 61 000-4-2:1995, EN 61 000-4-3:1996, EN 61 000-4-4:1995

4.3. Test in Compliance with

EMI Test (conduction and radiation)	: European Standard EN 55022 Class B
Harmonics Test	: European Standard EN 61000-3-2.
Voltage Fluctuations Test	: European Standard EN 61000-3-3.
EMS Test (ESD, RS and EFT)	: EN 50 082-1:1997 EN 61 000-4-2:1995, EN 61 000-4-3:1996, EN 61 000-4-4:1995

4.4. Frequency Range Investigated

a. Conducted emission test: from 150 kHz to 30 MHz
b. Radiated emission test: from 30 MHz to 1,000 MHz
c. Radio frequency electromagnetic field immunity test : 80-1000 MHz.

4.5. Test Distance

The test distance of radiated emission test from antenna to EUT is 10 M.
The test distance of radio frequency electromagnetic field immunity test from antenna to EUT is 3 M.

5. Test of Conducted Powerline

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 kHz on the 230V AC power and return leads of the EUT according to the methods defined in European Standard EN 55022 Clause 9. 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 producing maximum conducted emissions.

5.1. Description of Major Test Instruments

Test Receiver	HP 8591EM
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

5.2. Test Procedures

a. The EUT was placed on a desk 0.8 meters height from the metal ground plane and 0.4 meter from the conducting wall of the shielding room and it was kept at least 0.8 meters 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 CISPR states that a 50 ohm , 50 microhenry LISN should be used.

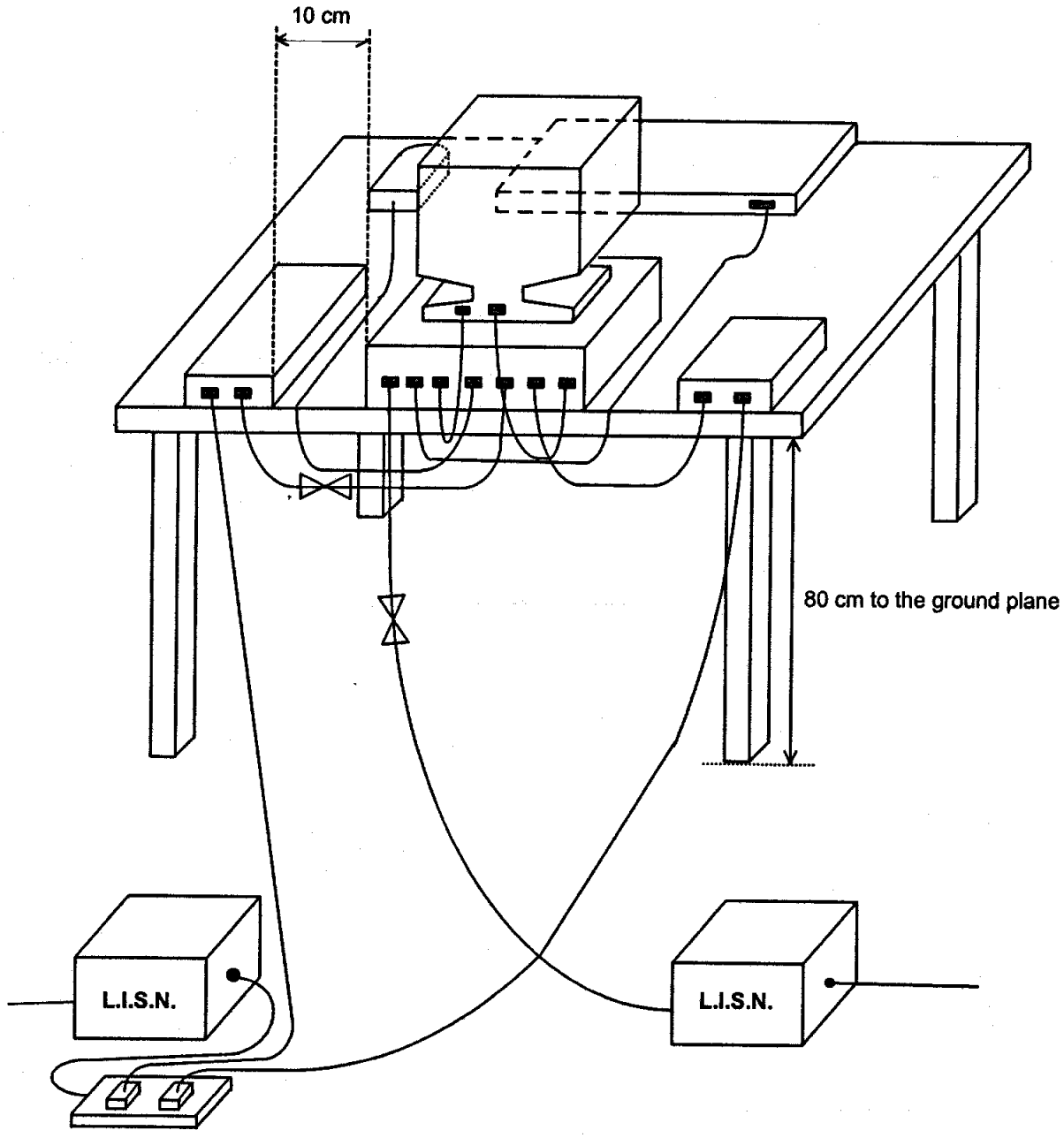
f. Both sides of AC line were checked for maximum conducted interference.

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/or average methods and reported.

5.3. Typical Test Setup Layout of Conducted Powerline



5.4. Test Result of AC Powerline Conducted Emission

- Equipment meets the technical specifications of EN 55022:1994/A1:1995/A2:1997
- Frequency Range of Test : from 150 kHz to 30 MHz
- Temperature : 29°C
- Relative Humidity : 68 %
- Test Date : Jul. 12, 1999

The Conducted Emission test was passed at minimum margin LINE 12.759 MHz / 54.80 dBuV.

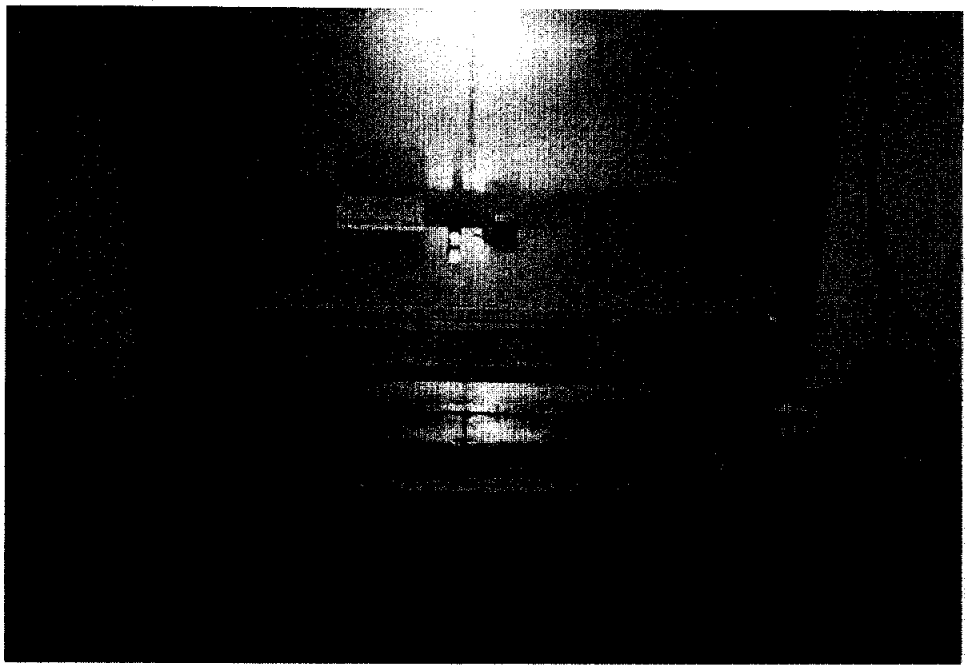
Freq.	Line	Meter Reading				Limits				Margin	
	or	Q.P.	A.V.	Q.P.	A.V.	Q.P.	A.V.	Q.P.	A.V.	Q.P.	A.V.
(MHz)	Neutral	(dBuV)	(dBuV)	(uV)	(uV)	(dBuV)	(dBuV)	(uV)	(uV)	(dB)	(dB)
0.216	L	49.30	40.50	291.74	105.93	62.95	52.95	1404.77	444.23	-13.65	-12.45
12.759	L	54.80	34.60	549.54	53.70	60.00	50.00	1000.00	316.23	-5.20	-15.40
0.216	N	49.40	41.50	295.12	118.85	62.97	52.97	1407.35	445.04	-13.57	-11.47
0.647	N	37.50	36.80	74.99	69.18	56.00	46.00	630.96	199.53	-18.50	-9.20
12.344	N	49.30	39.80	291.74	97.72	60.00	50.00	1000.00	316.23	-10.70	-10.20
15.847	N	44.30	38.00	164.06	79.43	60.00	50.00	1000.00	316.23	-15.70	-12.00

Test Engineer : Kenny
KENNY CHUANG

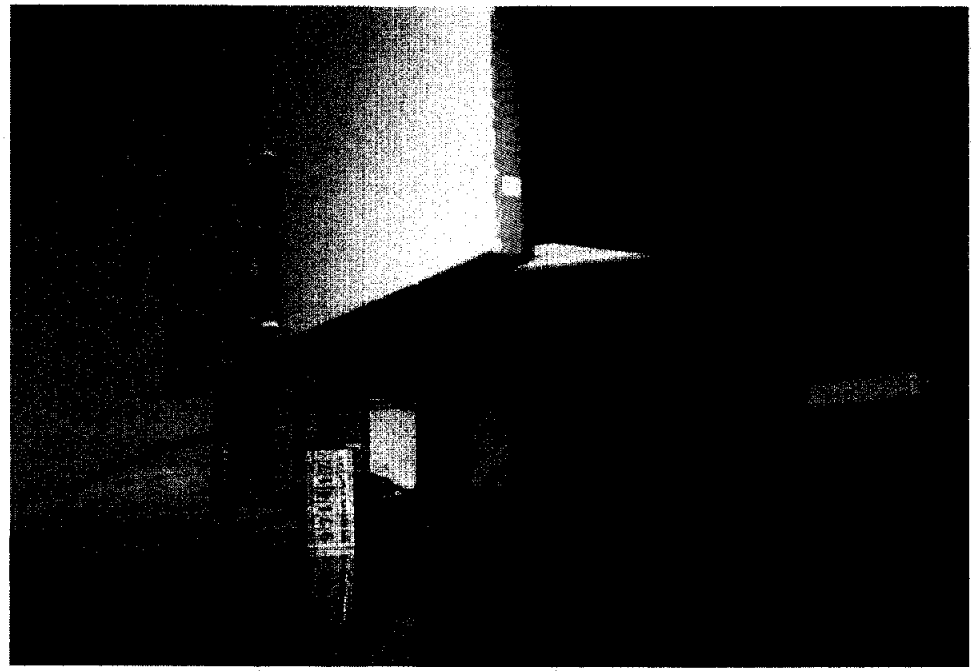
5.5. Photographs of Counducted Powerline Test Configuration

- The photographs show the configuration that generates the maximum emission.

FRONT VIEW



REAR VIEW



6. Test of Radiated Emission

Radiated emissions from 30 MHz to 1000 MHz were measured with a bandwidth of 120 kHz according to the methods defines in European Standard EN 55022, Clause 10. 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. Description of Major Test Instruments

Amplifier	(HP 8447D)
Attenuation	10 dB
RF Gain	25 dB
Signal Input	0.1 MHz to 1.3 GHz
Spectrum Analyzer	(HP 8560E)
Attenuation	10 dB
Start Frequency	30 MHz
Stop Frequency	1,000 MHz
Video Bandwidth	1 MHz
Signal Input	30 Hz to 2.9 GHz
Test Receiver	(R&S ESVP)
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.

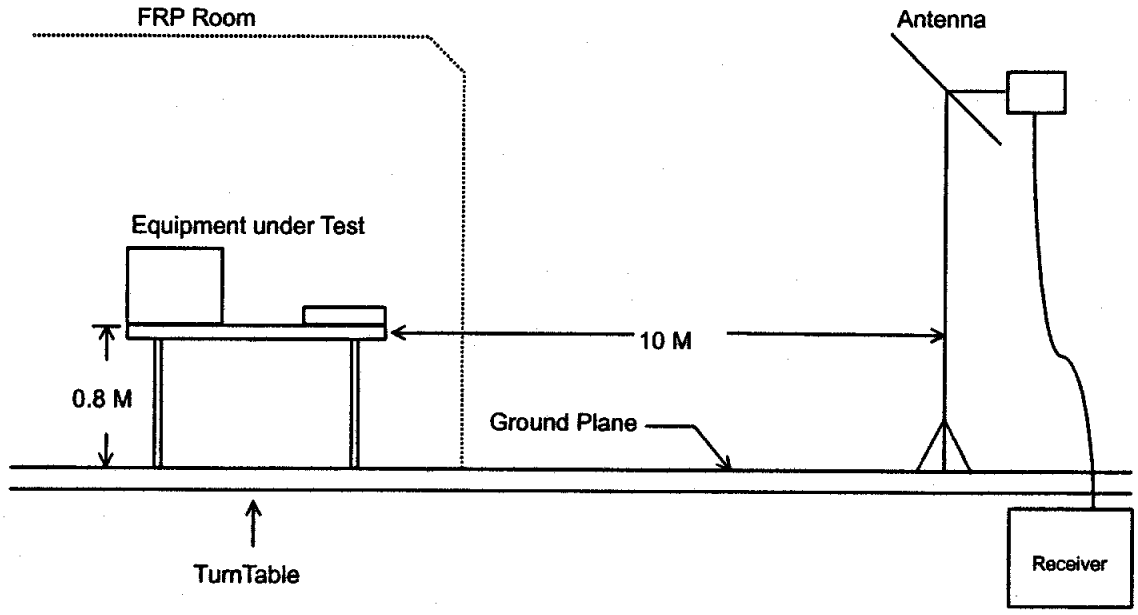
d. The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.

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

- Equipment meets the technical specifications of EN 55022:1994/A1:1995/A2:1997
- Frequency Range of Test : from 30 MHz to 1000 MHz
- Test Distance : 10 M
- Temperature : 31°C
- Relative Humidity : 60 %
- Test Date : Jul. 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:

VERTICAL 45.390 MHz / 26.67 dBuV Antenna Height 1 Meter , Turntable Degree 270 °.

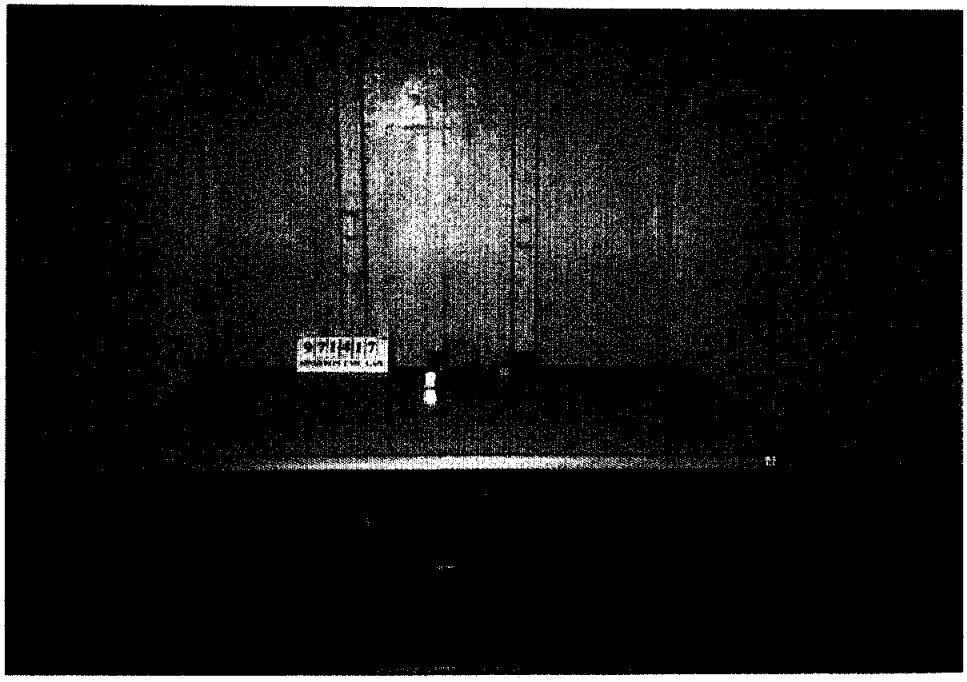
Frequency (MHz)	Polarity	Antenna Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Limits (dBuV)	Limits (uV)	Emission (dBuV)	Level (uV)	Margin (dB)
111.310	H	11.30	1.33	6.76	30.00	31.62	19.39	9.32	-10.61
45.390	V	9.40	0.67	16.60	30.00	31.62	26.67	21.55	-3.33
55.630	V	5.80	0.83	15.71	30.00	31.62	22.34	13.09	-7.66
71.992	V	5.30	1.00	18.34	30.00	31.62	24.64	17.06	-5.36
85.072	V	7.90	1.00	12.84	30.00	31.62	21.74	12.22	-8.26
110.700	V	11.30	1.33	10.55	30.00	31.62	23.18	14.42	-6.82

Test Engineer : Jack
JACK DENG

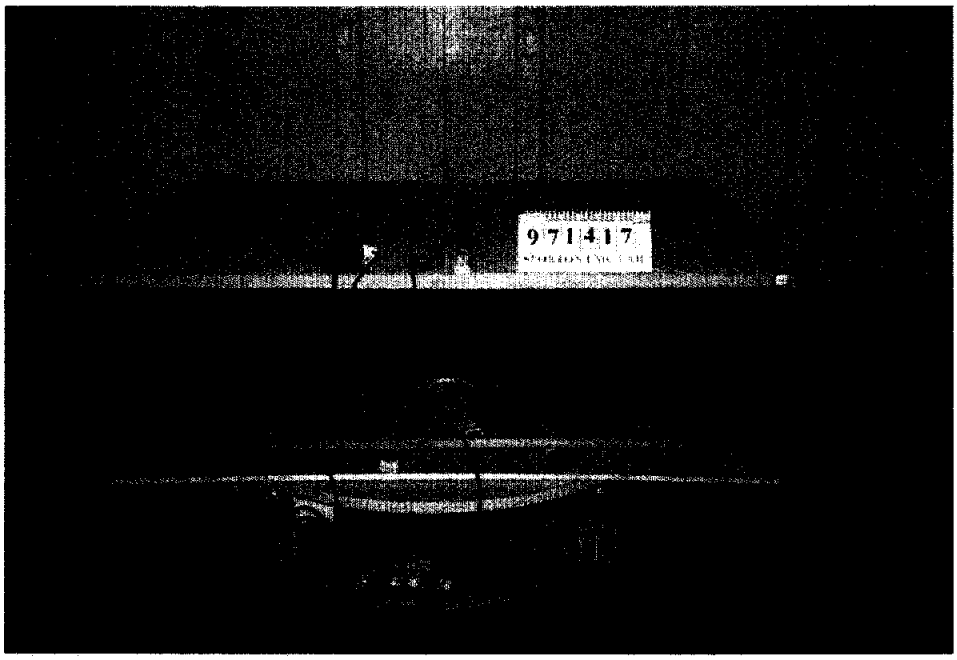
6.5. Photographs of Radiated Emission Test Configuration

- The photographs show the configuration that generates the maximum emission.

FRONT VIEW



REAR VIEW



7. HARMONICS TEST

7.1. STANDARD

- Product Standard : EN 61000-3-2 (1995)

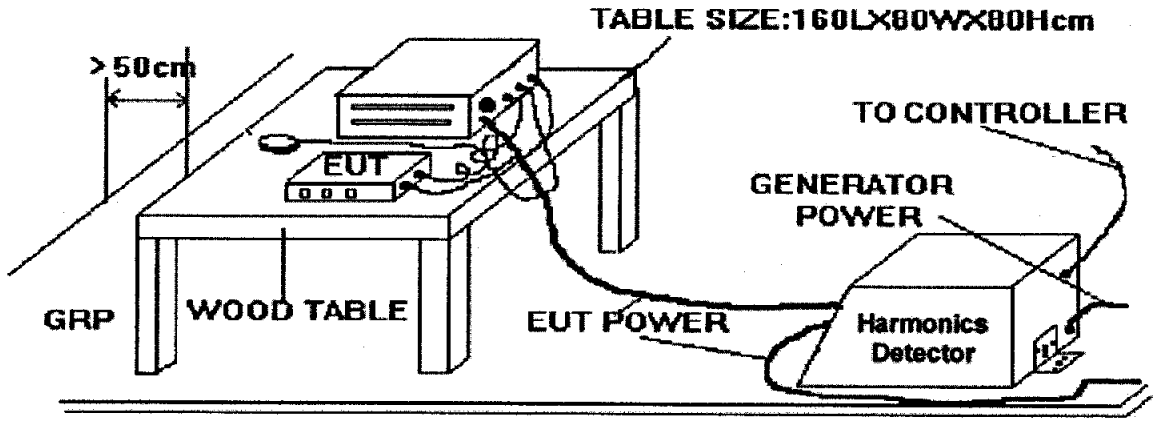
7.2. TEST PROCEDURE

The measured values of the harmonics components of the input current, including line current and neutral current, shall be compared with the limits given in Clause 4.

7.3. TEST EQUIPMENT SETTINGS :

- Line Voltage : 230 V
- Line Frequency : 50 Hz
- Device Class : A
- Current Measurement Range : High
- Measurement Delay : 10.0 seconds
- Test Duration : 2.00 minutes
- Class determination Pre-test Duration : 10.00 seconds

7.4. TEST SETUP



7.5. CURRENT HARMONICS TEST

7.5.1. TEST DATA OF CURRENT HARMONICS

- FINAL TEST RESULT : ***PASS***
- Fundamental Current : 0.267 A
- Real Power : 58.6 W
- Power Factor : 0.453
- Percent in Envelope : 100.0 %
- Temperature : 26 ℃
- Relative Humidity : 52% RH
- Test Date : July. 15, 1999

Harmonic Number	Standard Limit (A rms)	Max. Span Values (A rms)	Harmonic Number	Standard Limit (A rms)	Max. Span Values (A rms)
1	Fund	0.2674	21	0.1070	0.0265
2	1.0800	0.0021	22	0.0840	0.0010
3	2.3000	0.2456	23	0.0980	0.0152
4	0.4300	0.0019	24	0.0770	0.0009
5	1.1400	0.2304	25	0.0900	0.0143
6	0.3000	0.0015	26	0.0710	0.0008
7	0.7700	0.2098	27	0.0830	0.0171
8	0.2300	0.0014	28	0.0660	0.0006
9	0.4000	0.1836	29	0.0780	0.0182
10	0.1840	0.0009	30	0.0610	0.0005
11	0.3300	0.1551	31	0.0730	0.0171
12	0.1530	0.0008	32	0.0580	0.0004
13	0.2100	0.1255	33	0.0680	0.0141
14	0.1310	0.0005	34	0.0540	0.0004
15	0.1500	0.0961	35	0.0640	0.0100
16	0.1150	0.0014	36	0.0510	0.0005
17	0.1320	0.0689	37	0.0610	0.0055
18	0.1020	0.0008	38	0.0480	0.0004
19	0.1180	0.0452	39	0.0580	0.0021
20	0.0920	0.0008	40	0.0460	0.0005

Test Engineer : Bruce
Bruce Huang

8. VOLTAGE FLUCTUATIONS TEST

8.1. STANDARD

- Product Standard : EN 61000-3-3 (1995)

8.2. TEST PROCEDURE

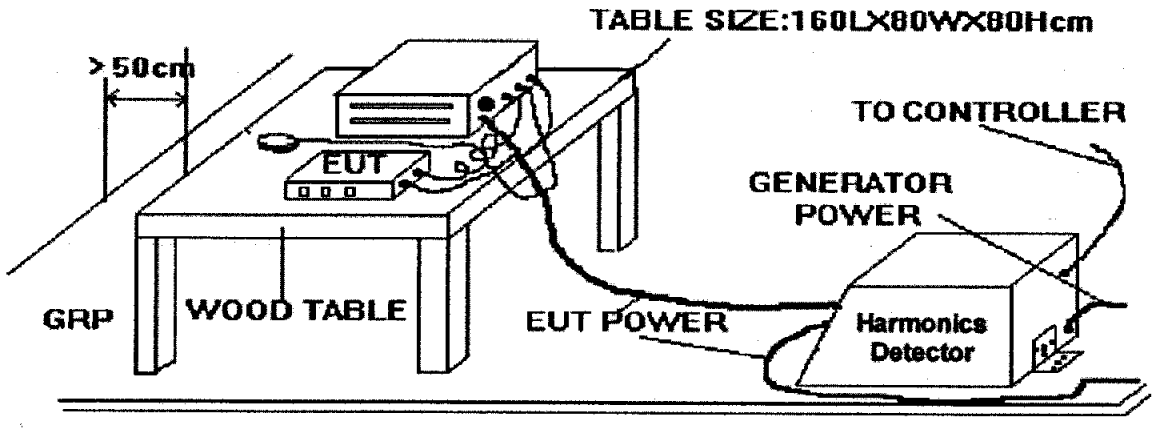
The equipment shall be tested under the conditions of **Clause 5.**

The total impedance of the test circuit, excluding the appliance under test, but including the internal impedance of the supply source, shall be equal to the reference impedance. The stability and tolerance of the reference impedance shall be adequate to ensure that the overall accuracy of ±8% is achieved during the whole assessment procedure.

8.3. TEST EQUIPMENT SETTINGS :

- Line Voltage : 230 V
- Line Frequency : 50 Hz
- Measurement Delay : 10.0 seconds
- Pst Integration Time : 10 minutes
- Pst Integration Periods : 1
- Test Duration : 00:10:00 minutes

8.4. TEST SETUP



8.5. TEST RESULT OF VOLTAGE FLUCTUATION AND FLICKER TEST

8.5.1. TEST DATA OF VOLTAGE FLUCTUATION AND FLICKER

- FINAL TEST RESULT : ***PASS***
- Temperature : 26 ℃
- Relative Humidity : 52% RH
- Test Date : July. 15, 1999

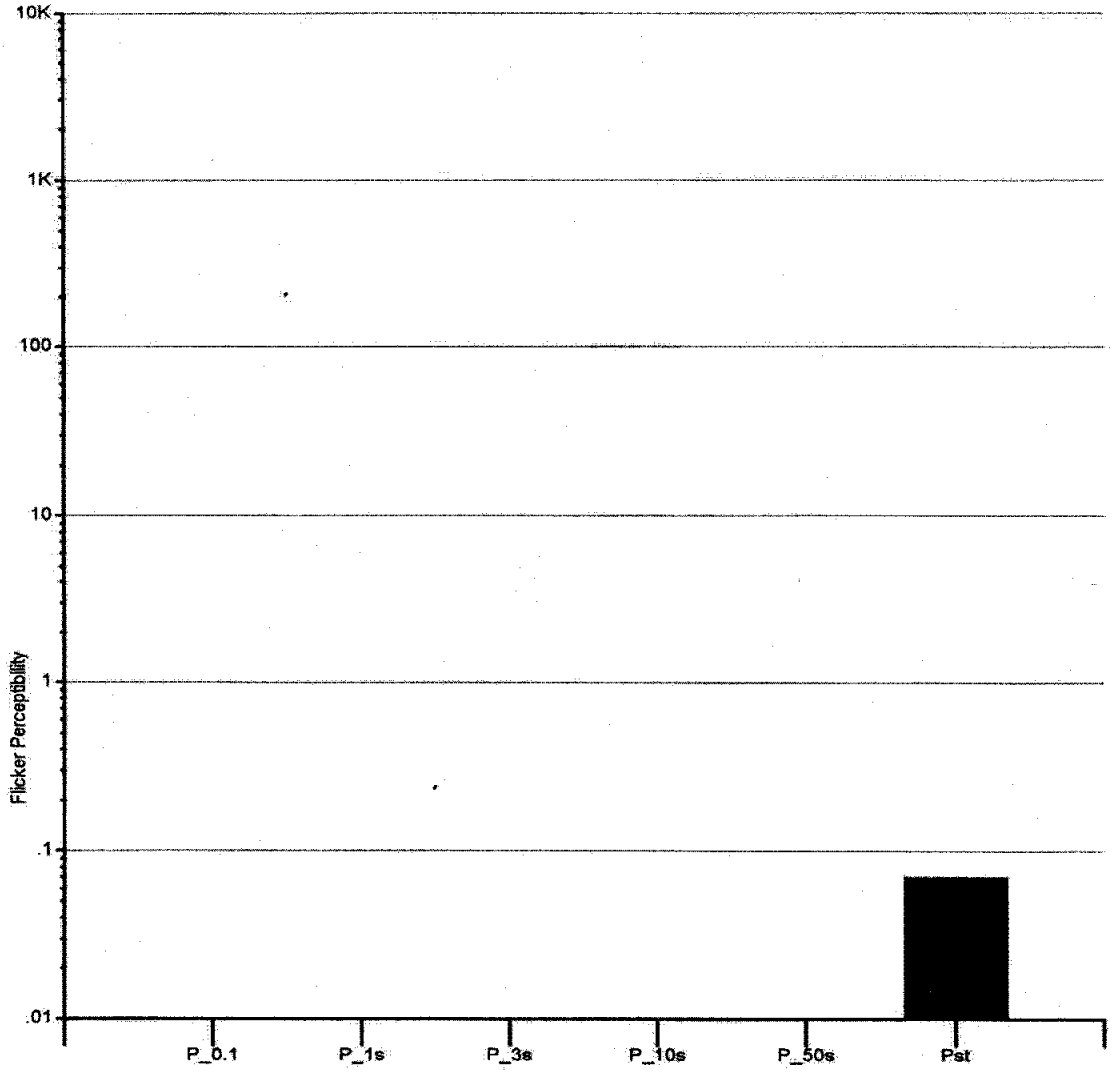
	Pst	Plt	Dc (%)	Dmax (%)	Dt (%)
Reading	0.070	0.00	0.00	0.00	0.00
Limit	0.65	1.0	3.0	4.0	3.0

Test Engineer : Bruce

Bruce Huang

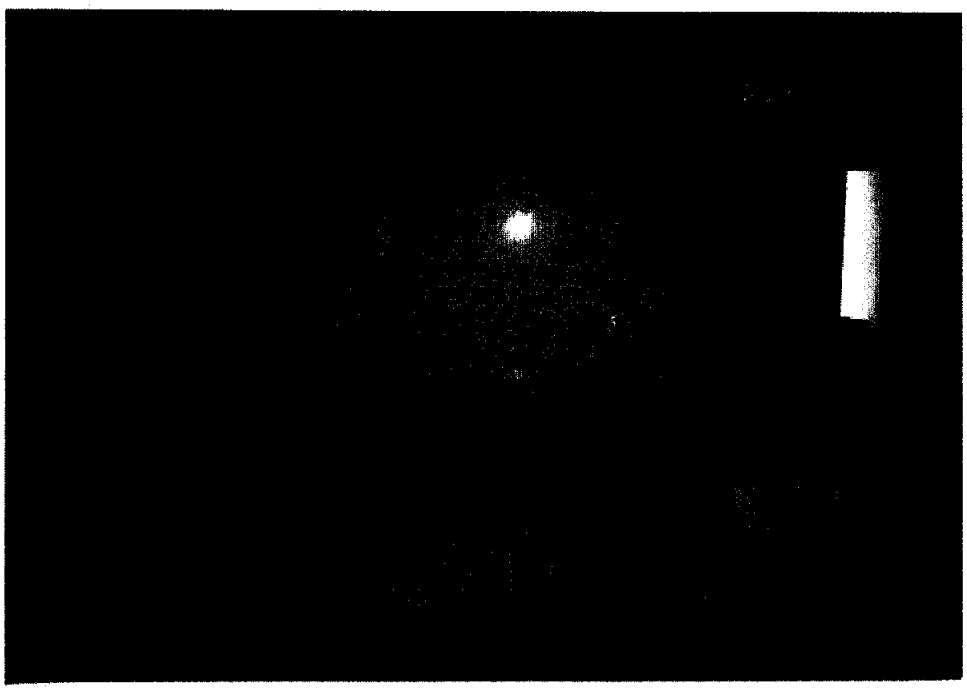
8.5.2. TEST GRAPH OF VOLTAGE FLUCTUATION AND FLICKER

Pst Histogram

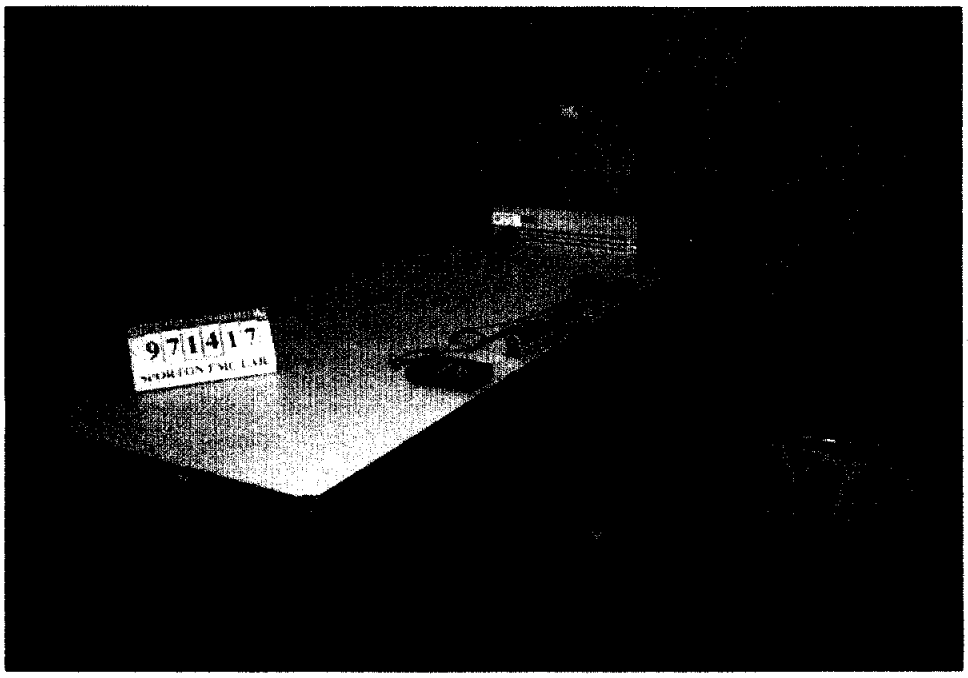


8.6. PHOTOGRAPHS OF HARMONICS TEST, VOLTAGE FLUCTUATION AND FLICKER TEST

FRONT VIEW



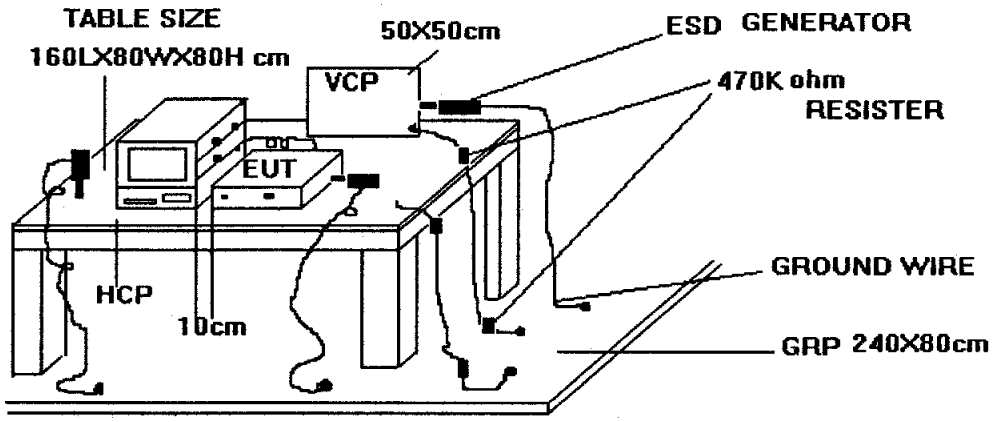
REAR VIEW



9. Electrostatic Discharge Immunity Test (ESD)

- Pass Performance Criteria : B
- Remark : During testing at air discharge +-8KV on DC-in jack, the DC voltage of the EUT decreased about 15%.
- Basic Standard : EN 61 000-4-2:1995
- Generic Standard : EN 50 082-1:1997
- Level : 3 for air discharge,
  : 2 for contact discharge
- Tested voltage : ±2 / ±4 / ±8 KV for air discharge,
  : ±2 / ±4 KV for contact discharge
- Temperature : 25 °C
- Relative Humidity : 53 %
- Test Date : Jul. 15, 1999

9.1. Test setup



The test setup consists of the test generator, EUT and auxiliary instrumentation necessary to perform DIRECT and INDIRECT application of discharges to the EUT as applicable, in the follow manner :

a. CONTACT DISCHARGE to the conductive surfaces and to coupling plane;
b. AIR DISCHARGE at insulating surfaces.

The preferred test method is that of type tests performed in laboratories and the only accepted method of demonstrating conformance with this standard. The EUT was arranged as closely as possible to arrangement in final installed conditions.

9.2. Test Setup for Tests Performed in Laboratory

A ground reference plane was provided on the floor of the test site. It was a metallic sheet (copper or aluminum) of 0.25 mm, minimum thickness; other metallic may be used but they shall have at least 0.65 mm thickness. In the SPORTON EMC LAB., we provided 1 mm thickness aluminum ground reference plane or 1 mm thickness stainless steel ground reference plane. The minimum size of the ground reference plane is 1 m x 1 m, the exact size depending on the dimensions of the EUT. It was connected to the protective grounding system.

The EUT was arranged and connected according to its functional requirements. A distance of 1m minimum was provided between the EUT and the wall of the lab. and any other metallic structure. In cases where this length exceeds the length necessary to apply the discharges to the selected points, the excess length shall, where possible, be placed non-inductively off the ground reference plane and shall not come closer than 0.2m to other conductive parts in the test setup.

Where the EUT is installed on a metal table, the table was connected to the reference plane via a cable with a 470k ohm resister located at each end, to prevent a build-up of charge. The test setup was consist a wooden table, 0.8m high, standing on the ground reference plane. A HCP, 1.6 m x 0.8 m, was placed on the table. The EUT and cables was isolated from the HCP by an insulating support 0.5 mm thick. The VCP size, 0.5 m x 0.5 m.

9.3. ESD Test Procedure

a. In the case of air discharge testing the climatic conditions shall be within the following ranges:
   - ambient temperature: 15℃ to 35℃;
   - relative humidity : 30% to 60%;
   - atmospheric pressure : 68 KPa (680 mbar) to 106 KPa (1060 mbar).

b. Test programs and software shall be chosen so as to exercise all normal modes of operation of the EUT. The use of special exercising software is encouraged, but permitted only where it can be shown that the EUT is being comprehensively exercised.

c. The test voltage shall be increased from the minimum to the selected test severity level, in order to determine any threshold of failure. The final severity level should not exceed the product specification value in order to avoid damage to the equipment.

d. The test shall be performed with single discharges. On preselected points at least ten single discharges (in the most sensitive polarity) shall be applied.

e. For the time interval between successive single discharges an initial value of one second is recommended. Longer intervals may be necessary to determine whether a system failure has occurred.

f. In the case of contact discharges, the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

g. In the case of painted surface covering a conducting substrate, the following procedure shall be adopted :
   - If the coating is not declared to be an insulating coating by the equipment manufacturer, then the pointed tip of the generator shall penetrate the coating so as to make contact with the conducting substrate.
   - Coating declared as insulating by the manufacturer shall only be submitted to the air discharge.
   - The contact discharge test shall not be applied to such surfaces.

h. In the case of air discharges, the round discharge tip of the discharge electrode shall be approached as fast as possible (without causing mechanical damage) to touch the EUT . After each discharge, the ESD generator (discharge electrode) shall be removed from the EUT. The generator is then retriggered for a new single discharge. This procedure shall be repeated until the discharges are completed. In the case of an air discharge test, the discharge switch, which is used for contact discharge, shall be closed.

9.4. Test Severity Levels

9.4.1. Contact Discharge

Level	Test Voltage (KV) of Contact discharge
1	±2
2	±4
3	±6
4	±8
X	Specified

Remark : "X" is an open level.

9.4.2. Air Discharge

Level	Test Voltage (KV) of Air Discharge
1	±2
2	±4
3	±8
4	±15
X	Specified

Remark : "X" is an open level.

9.5. Test Points

9.5.1. Test Result of Air Discharge

Test Point	Voltage	Tested No.	Observation	Result
Case	±2 / ±4 / ±8 KV	BY 10	NORMAL	*PASS*
LED	±2 / ±4 / ±8 KV	BY 10	NORMAL	*PASS*

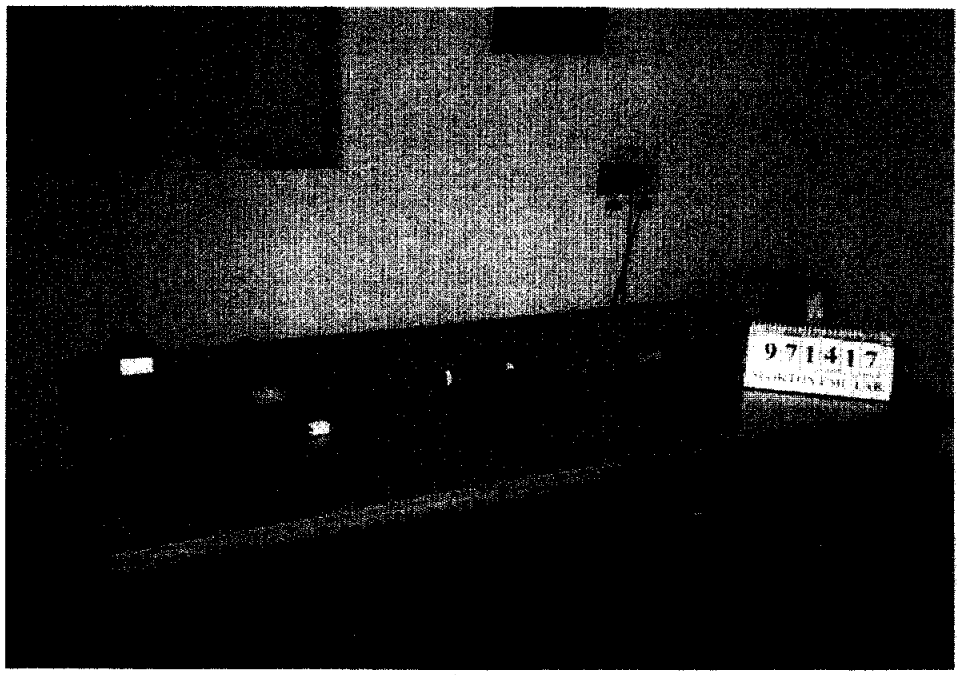
9.5.2. Test Result of Contact Discharge

Polarity	Voltage	Tested No.	Observation	Result
Horizontal(At Front)	±2 / ±4 KV	BY 10	NORMAL	*PASS*
Horizontal (At Left)	±2 / ±4 KV	BY 10	NORMAL	*PASS*
Horizontal (At Right)	±2 / ±4 KV	BY 10	NORMAL	*PASS*
Horizontal (At Rear)	±2 / ±4 KV	BY 10	NORMAL	*PASS*
Vertical (At Front)	±2 / ±4 KV	BY 10	NORMAL	*PASS*
Vertical (At Left)	±2 / ±4 KV	BY 10	NORMAL	*PASS*
Vertical (At Right)	±2 / ±4 KV	BY 10	NORMAL	*PASS*
Vertical (At Rear)	±2 / ±4 KV	BY 10	NORMAL	*PASS*

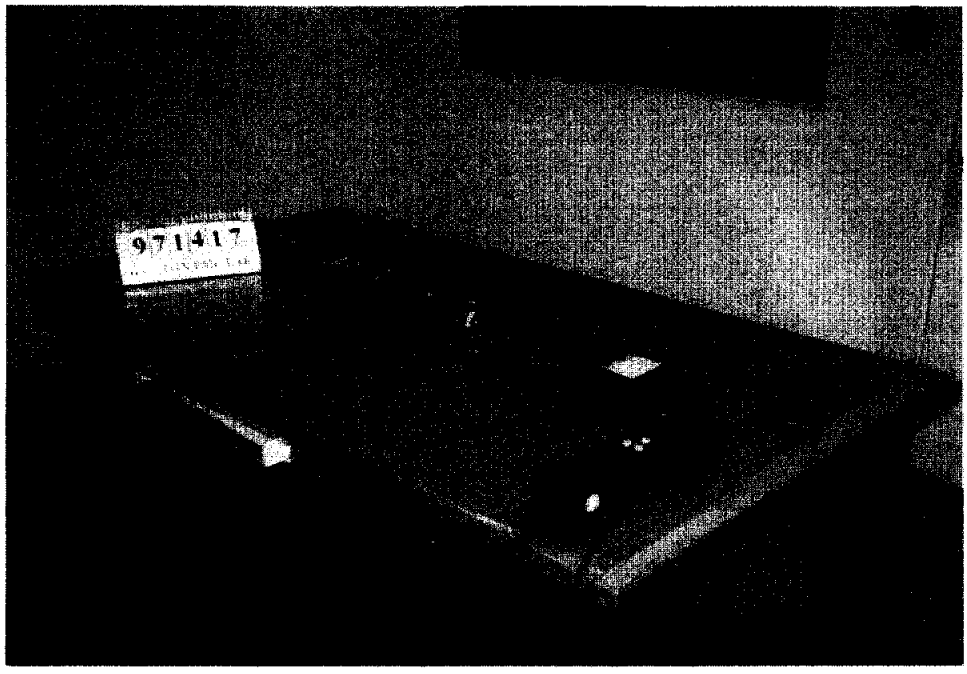
Test Engineer : Bruce
BRUCE HUANG

9.6. Photographs of Electrostatic Discharge Immunity Test

FRONT VIEW



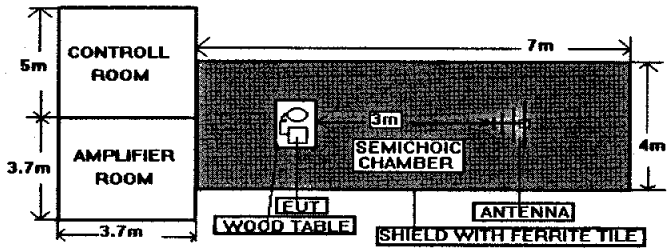
REAR VIEW



10. Radio Frequency Electromagnetic Field Immunity Test (RS)

- Pass Performance Criteria : A
- Basic Standard : EN 61 000-4-3:1996
- Generic Standard : EN 50 082-1:1997
- Level : 2
- Frequency Range : 80-1000 MHz
- Field Strength : 3 V/m (Modulated 80% AM)
- Temperature : 25 °C
- Relative Humidity : 55 %
- Test Date : Jul. 15, 1999

10.1. Test setup



NOTE : The SPORTON 7m x 4m x 4m semichoic chamber is compliance with the sixteen points uniform field requirement as stated in IEC 1000-4-3 Section 6.2.

The procedure defined in this part requires the generation of electromagnetic fields within which the test sample is placed and its operation observed. To generate fields that are useful for simulation of actual (field) conditions may require significant antenna drive power and the resultant high field strength levels. To comply with local regulations and to prevent biological hazards to the testing personnel, it is recommended that these tests be carried out in a shielded enclosure or semichoic chamber.

10.2. Test Procedure

a. The equipment to be tested is placed in the center of the enclosure on a wooden table. The equipment is then connected to power and signal leads according to pertinent installation instructions.

b. The bilog antenna which is enabling the complete frequency range of 80-1000 MHz is placed 3m away from the equipment. The required field strength is determined by placing the field strength meter(s) on top of or directly alongside the equipment under test and monitoring the field strength meter via a remote field strength indicator outside the enclosure while adjusting the continuous-wave to the applicable antennae.

c. The test is normally performed with the antenna facing the most sensitive side of the EUT. The polarization of the field generated by the biconical antenna necessitates testing each position twice, once with the antenna positioned vertically and again with the antenna positioned horizontally. The circular polarization of the field from the log-spiral antenna makes a change of position of the antenna unnecessary.

d. At each of the above conditions, the frequency range is swept 80-1000 MHz, pausing to adjust the R.F. signal level or to switch oscillators and antenna. The rate of sweep is in the order of 1.5*10-3 decades/s. The sensitive frequencies or frequencies of dominant interest may be discretely analyzed.

10.3. Test Severity Levels

Frequency Band : 80-1000 MHz

Level	Test field strength (V/m)
1	1
2	3
3	10
X	Specified

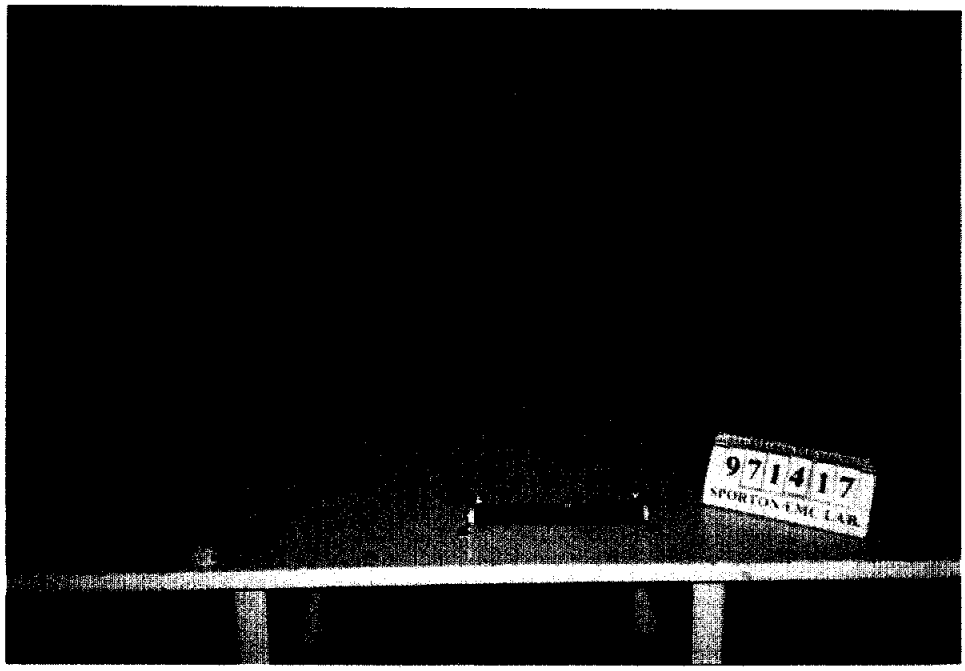
Remark : "X" is an open class.

Test Engineer : Bruce

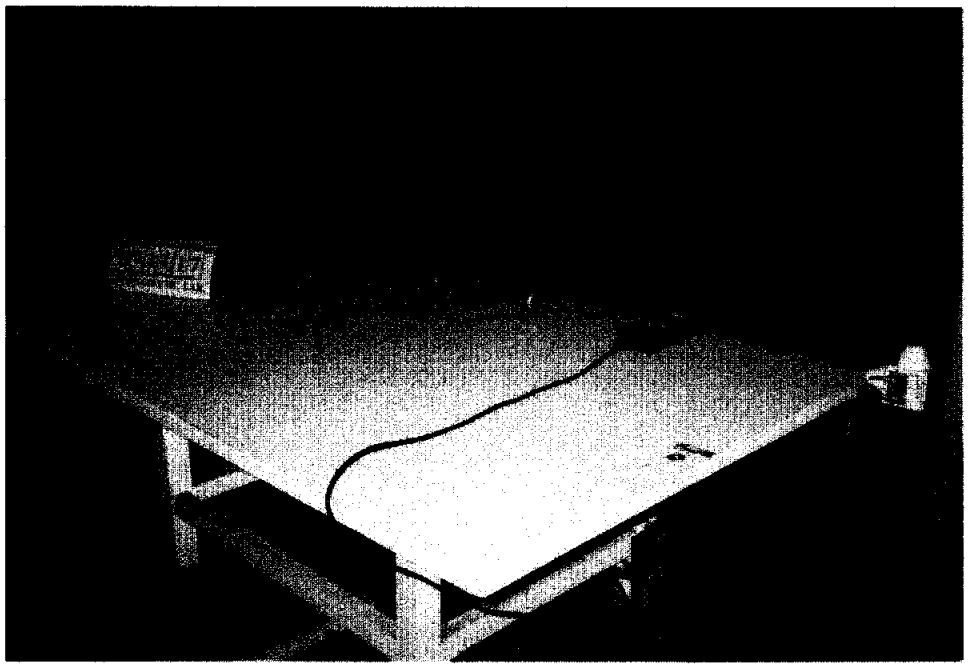
BRUCE HUANG

10.4. Photographs of Radio Frequency Electromagnetic Field Immunity Test

FRONT VIEW



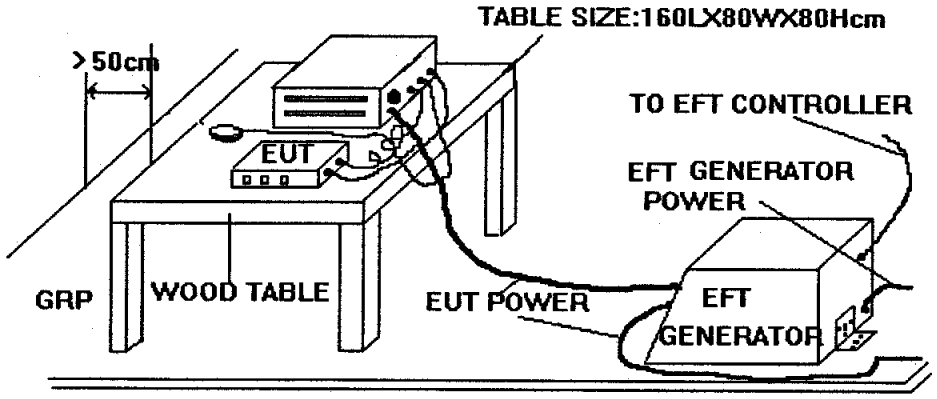
REAR VIEW



11. Electrical Fast Transient/Burst Immunity Test (EFT/BURST)

- Pass Performance Criteria : B
- Remark : During testing at +-1KV, the DC voltage of the EUT decreased about 10%.
- Basic Standard : EN 61 000-4-4:1995
- Generic Standard : EN 50 082-1:1997
- Level : on Power Supply -- 2
- Tested voltage : on Power Supply -- 0.5/1.0 KV
- Temperature : 26°C
- Relative Humidity : 52%
- Test Date : Jul. 15, 1999

11.1. Test setup



The EUT was placed on a ground reference plane and was insulated from it by an insulating support about 0.1m thick. If the EUT is table-top equipment, it was located approximately 0.8m above the GRP.. The GRP. Was a metallic sheet (copper or aluminum) of 0.25 mm ,minimum thickness; other metallic may be used but they shall have at least 0.65 mm thickness. It shall project beyond the EUT by at least 0.1m on all sides and connected to the protective earth. In the SPORTON EMC LAB. We provided 1 mm thickness aluminum ground reference plane or 1 mm thickness stainless steel ground reference plane. The minimum size of the ground reference plane is 1 m x 1 m, the exact size depending on the dimensions of the EUT. It was connected to the protective grounding system. The EUT was arranged and connected according to its functional requirements. The minimum distance between the EUT and other conductive structures, except the GRP. Beneath the EUT, was more than 0.5 m. Using the coupling clamp, the minimum distance between the coupling plates and all other conductive structures, except the GRP. Beneath the EUT, was more than 0.5 m. The length of the signal and power lines between the coupling device and the EUT was 1m or less.

11.2. Test on Power Line

a. The EFT/B-generator was located on the GRP.. The length from the EFT/B-generator to the EUT as not exceed 1 m.

b. The EFT/B-generator provides the ability to apply the test voltage in a non-symmetrical condition to the power supply input terminals of the EUT.

11.3. Test on Communication Lines

a. The coupling clamp is composed of a clamp unit for housing the cable (length more than 3 m), and was placed on the GRP..

b. The coupling clamp provides the ability of coupling the fast transient/bursts to the cable under test.

11.4. Test Procedure

a. In order to minimize the effect of environmental parameters on test results, the climatic conditions when test is carrying out shall comply with the following requirements:
- ambient temperature: 15℃ to 35℃;
- relative humidity : 45% to 75%;
- atmospheric pressure : 68 Kpa (680 mbar) to 106 Kpa (1060 mbar).

b. In order to minimize the effect of environmental parameters on test results, the electromagnetic environment of the laboratory shall not influence the test results.

c. The variety and diversity of equipment and systems to be tested make it difficult to establish general criteria for the evaluation of the effects of fast transients/bursts on equipment and systems.

d. The test results may be classified on the basic of the operating conditions and the functional specification of the equipment under test, according to the following performance criteria :
- Normal performance within the specification limits.
- Temporary degradation or loss of function or performance which is self-recoverable.
- Temporary degradation or loss of function or performance which requires operator intervention or system reset.
- Degradation or loss of function which is not recoverable due to damage of equipment (components).

11.5. Test Severity Levels

The following test severity levels are recommended for the fast transient/burst test :

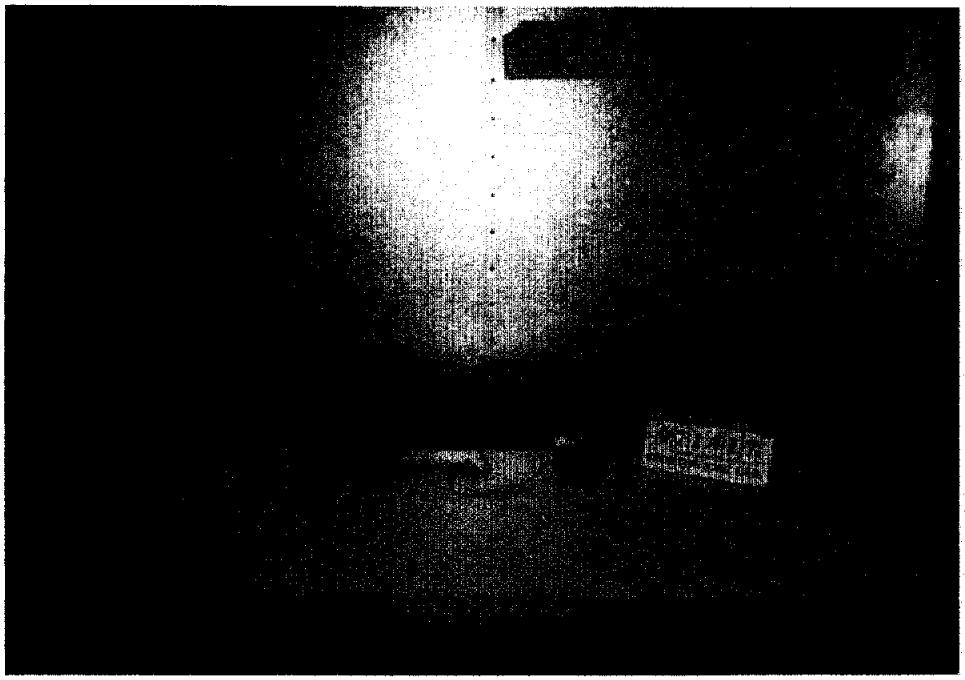
Open circuit output test voltage ± 10%		
Level	On Power Supply	On I/O signal, data and control line
1	0.5 KV	0.25 KV
2	1.0 KV	0.50 KV
3	2.0 KV	1.00 KV
4	4.0 KV	2.00 KV
X	Specified	Specified

Remark : " X " is an open level. The level is subject to negotiation between the user and the manufacturer or is specified by the manufacturer.

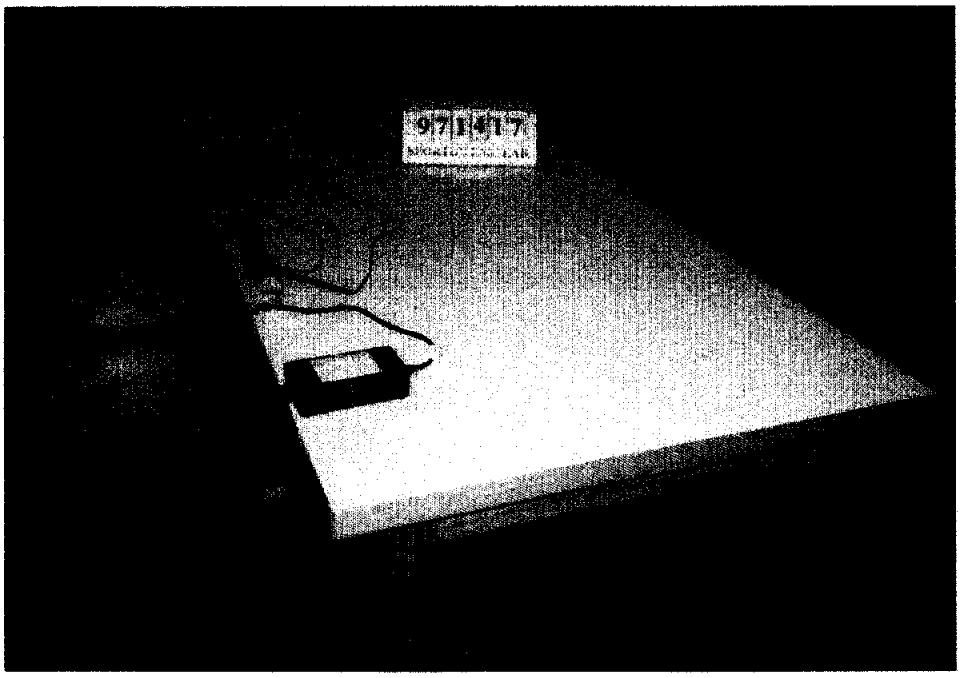
Test Engineer : Bruce
BRUCE HUANG

11.6. Photographs of Electrical Fast Transient/BURST Immunity Test

FRONT VIEW



REAR VIEW



12. Antenna Factor & Cable Loss

Frequency (Mhz)	Antenna Factor (dB)	Cable Loss (dB)
30	1.78	0.5
35	14.8	0.8
40	12.6	0.7
45	9.4	0.7
50	7.7	1.0
55	5.8	0.8
60	5.1	0.8
65	4.9	1.0
70	5.1	1.0
75	6.0	1.0
80	6.7	1.2
85	7.9	1.0
90	8.9	1.1
95	9.6	1.0
100	10.2	1.2
110	11.3	1.3
120	11.6	1.3
130	11.4	1.2
140	10.8	1.5
150	10.2	1.5
160	9.2	1.5
170	9.1	1.7
180	8.2	1.7
190	8.4	1.7
200	8.9	1.7
220	8.7	1.8
240	10.9	1.8
260	13.3	1.8
280	12.5	2.2
300	13.0	2.2
320	13.6	2.3
340	13.9	2.3
360	14.5	2.3
380	14.9	2.4
400	16.0	2.5
450	16.5	2.7
500	17.5	2.8
550	18.7	3.0
600	18.6	3.0
650	18.9	3.5
700	19.1	3.7
750	19.8	3.3
800	19.9	3.7
850	20.5	4.0
900	20.4	4.3
950	21.0	4.2
1000	21.2	4.3

13. List of Measuring Equipment Used

[EMI]

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver (site 2)	HP	8591EM	3710A01187	9 KHz – 1.8 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. 05, 1999	Conduction
Spectrum Analyzer (Site 4)	HP	8560E	3728A03185	30Hz - 2.9GHz	Sep. 09, 1998	Radiation
Amplifier (Site 4)	HP	8447D	294409072	100K -1.3GHz	Sep. 04, 1998	Radiation
Test Receiver (Site 4)	R&S	ESVP	893610/003	20MHz - 1.3GHz	April 12, 1999	Radiation
Bilog Antenna (Site 4)	CHASE	CBL6112A	2288	30MHz -2GHz	Jul. 13, 1999	Radiation
Half-wave dipole antenna (Site 4)	EMCO	3121C	9705-1285	28 M - 1GHz	May 19, 1999	Radiation
Turn Table (site 4)	EMCO	2080	9711-1090	0 ~ 360 degree	N/A	Radiation
Antenna Mast (site 4)	EMCO	2075	9711-2114	1 m- 4 m	N/A	Radiation

[EMS]

Instrument	Manufacturer	Model No.	Characteristics	Calibration Date	Remark
ESD Simulator	KEYTEK	MZ-15/EC	0 KV - 15 KV	Apr. 16, 1999	ESD
OMNI-Tip	KEYTEK	TPC-2	0 KV - 15 KV	Jul. 24, 1998	ESD
Amplifier	AR	100W 1000M3	80 MHz - 1 GHz	N/A	RS
Isotropic Field Probe	AR	FP3000A	10 KHz - 1 GHz	Jun. 20, 1999	RS
IEEE-488 Interface	AR	CP3000	N/A	N/A	RS
System Interface	EMC Automation	200	HP-IB INTERFACE	N/A	RS
Power Meter	EMC Automation	438A	100 KHz -4.2 GHz	N/A	RS
Video Camera controller	EMC Automation	VCC-01	N/A	N/A	RS
Signal Generator	HP	8648A	100 KHz - 1 GHz	Sep. 10, 1998	RS
Signal Generator	R&S	SMX	100 KHz - 1 GHz	Nov. 08, 1998	RS
Antenna	CHASE	CBL6121A	26 MHz - 1 GHz	Jun. 14, 1999	RS
Amplifier	AR	75W 75A220	25MHz - 300MHz	Jun. 14, 1999	RS
EFT Generator	KEYTEK	CE-40	0 KV - 4.4 KV	July 10, 1999	EFT
Harmonic/Flicker Test System	HP	6843A	4800VA 90A / 48A PEAK	Nov. 15, 1998	Harmonics, Flicker

14. Notice for Class A Product

Class A ITE is a category of all other ITE which satisfies the class A ITE limits but not the class B ITE limits. Such equipment should not be restricted in its sale but the following warning shall be included in the instructions for use:

Warning

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

15. Declaration of Conformity and the CE Mark

There are three possible procedures pertaining to the declaration of conformity :

15.1. Conformity Testing and Declaration of Conformity by the Manufacturer or His Authorized Representative Established within the Community or by an Importer.

- Article 10 (1) of the EMC Directive,
- § 3 (1) no. 2a of the EMC Act.

15.2. Declaration of Conformity Issued by the Manufacturer or His Authorized Representative Established within the Community or by an Importer Following Testing of the Product and Issued of an EC certificate of conformity by a competent body.

- Article 10 (2) of the EMC Directive,
- § 3 (1) no. 2b of the EMC Act.

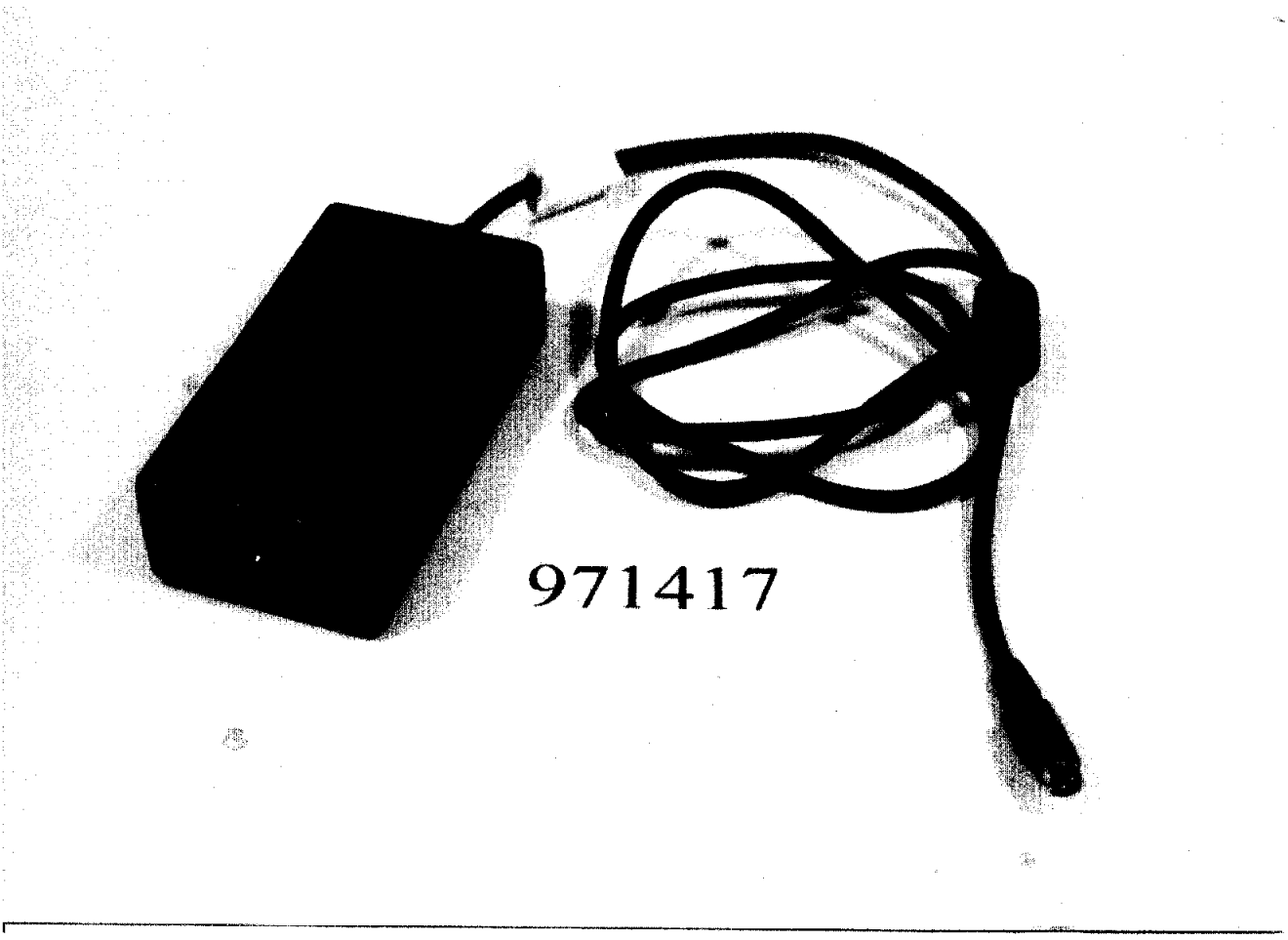
15.3. Declaration of Conformity Issued by the Manufacturer or His Authorized Representative Established within the Community or by an Importer Following Testing and Certification of the Product by a Notified Body.

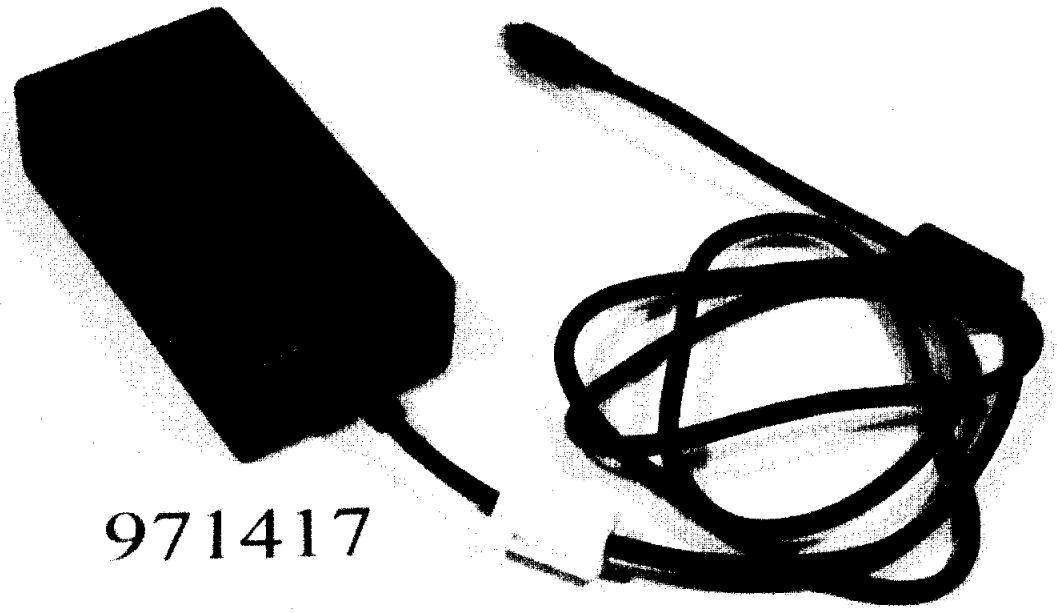
- Article 10 (5) of the EMC Directive,
- § 3 (1) no. 2b of the EMC Act (radio transmitting installations).

15.4. Specimen For The CE Marking Of Electrical / Electronical Equipment

The components of the CE marking shall have substantially the same vertical dimension, which may not be less than 5 mm.

APPENDIX A. Photographs of EUT

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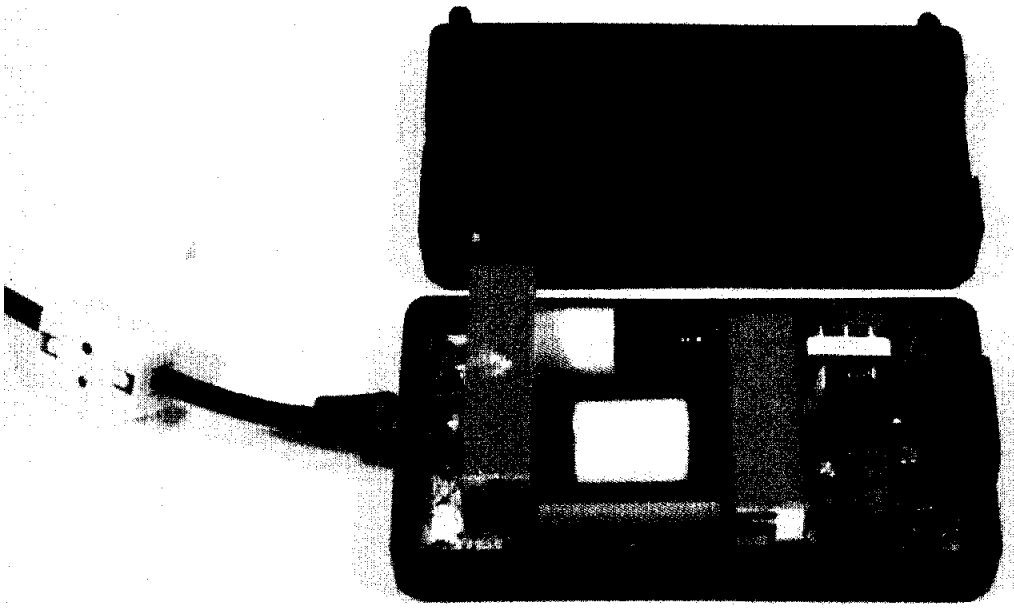

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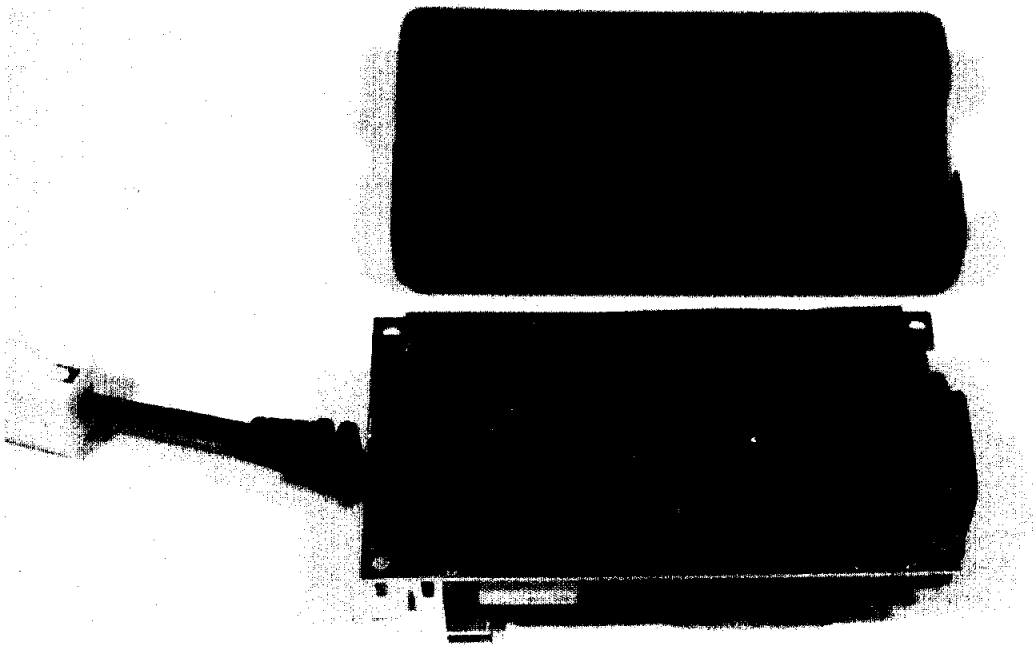

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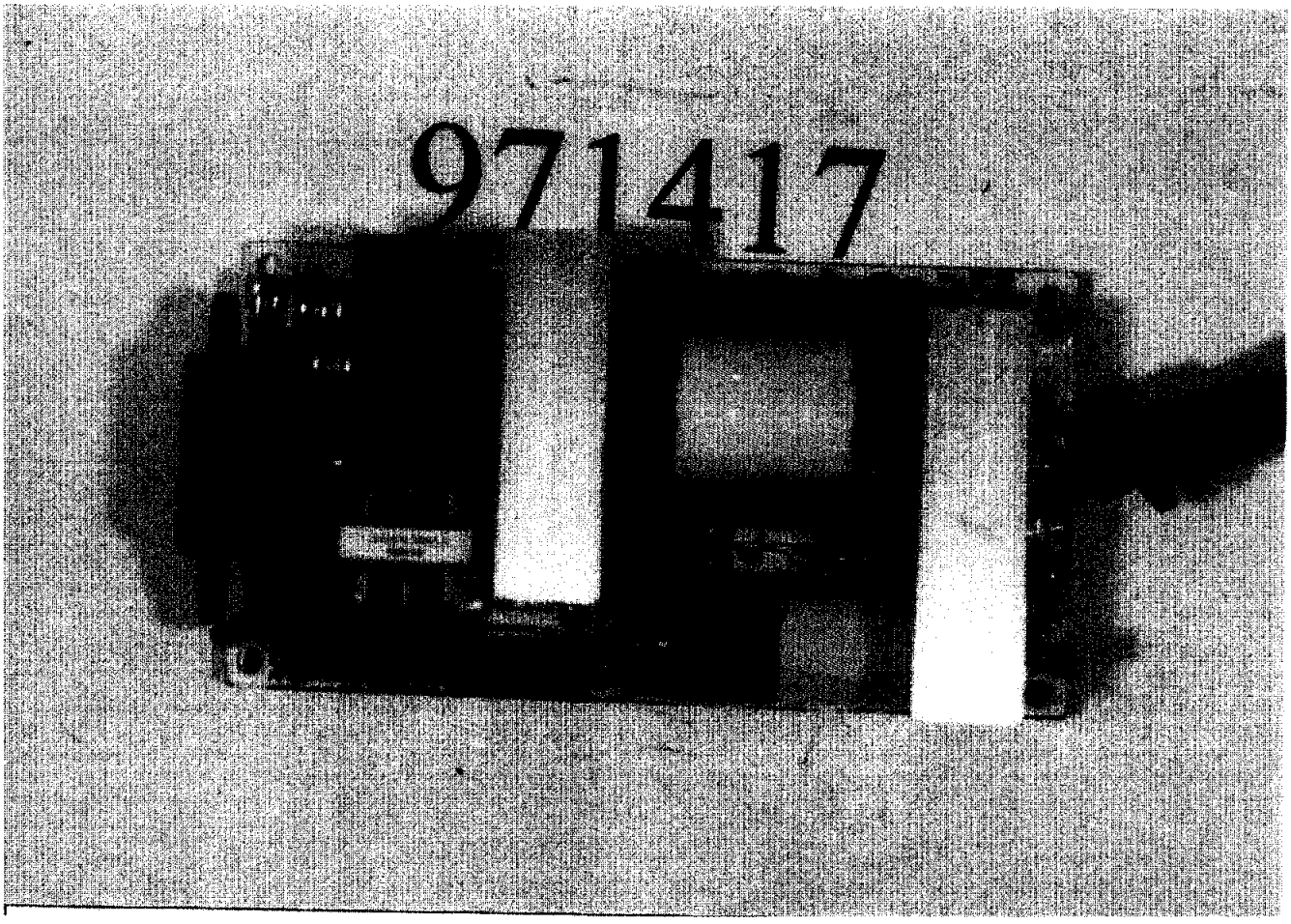
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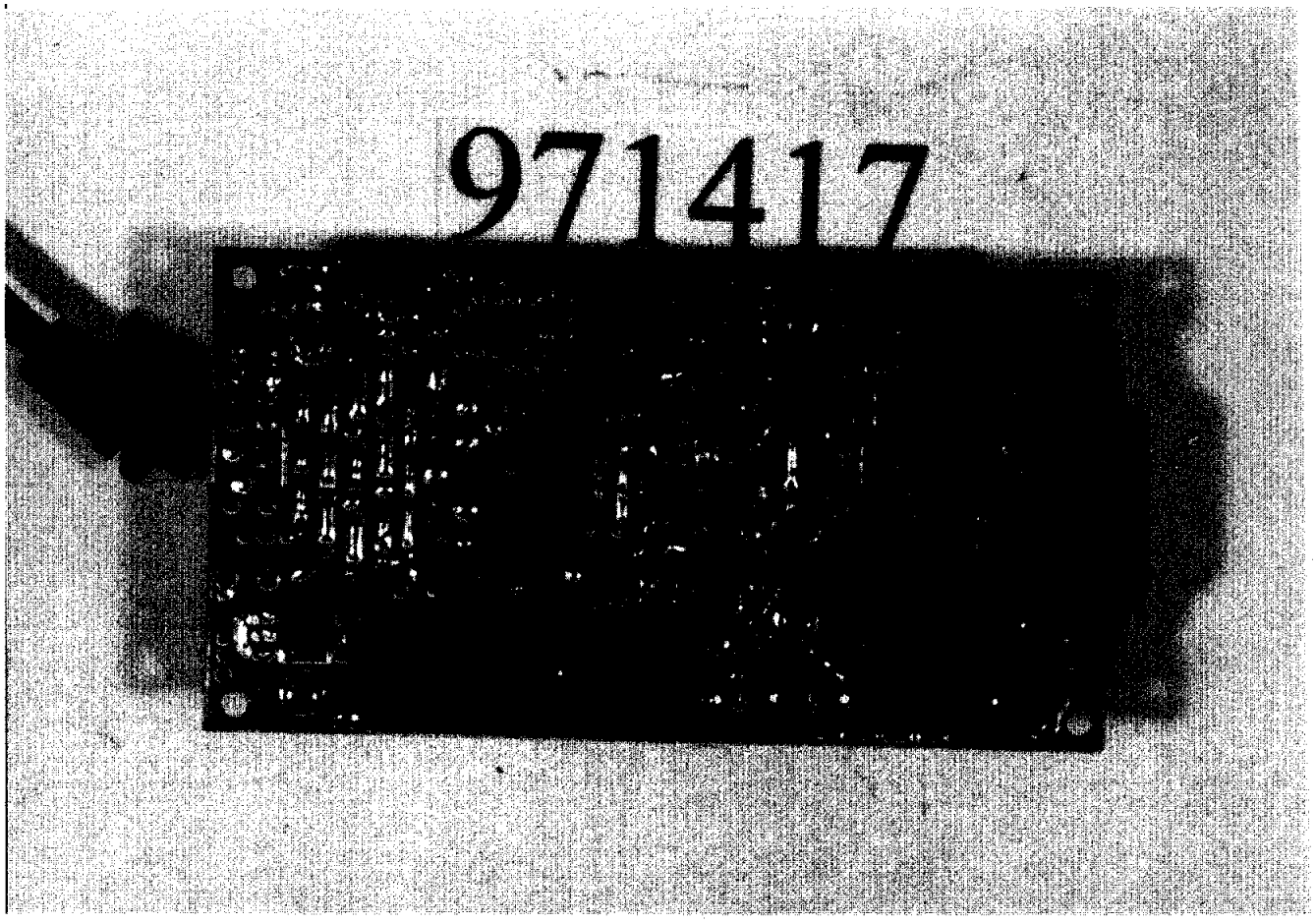
971417