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ADT CORP.

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ADT CORP.

# 致產品行銷歐洲之客戶 (CE Marking)

自 1996 年 1 月 1 日起，銷歐產品必需符合歐聯 EMC 指令之後才能上市。自 1997 年 1 月 1 日起，銷歐產品必須同時符合 EMC 指令和低電壓指令 (LVD－Safety) 之後才能上市。

技術檔案在行銷前必須準備齊全，以備歐聯國家機構隨時抽查，其內容至少包含：

1. Declaration of Conformity (DoC) Form － 必須由歐洲分公司或進口商簽名負責 (見附件樣本)。
2. EMC 測試報告和 SAFETY 測試報告 － 可由實驗室核發或透過認證機構。
3. 原始之設計圖稿及規格書 (如:線路圖、方塊圖、PCB Layout 圖、User's Manual 和 Service Manual 等)。
4. 敘述製造時之生產檢查程序，以確保 EMC 和 SAFETY 特性之維持。
5. 任何會影響到 EMC 和 SAFETY 的變更敘述和必要之測試記錄。

附註：* 產品上要貼上歐聯指令要求之 Label 標示，如右。
* DoC 簽名負責之廠商，有責任確保銷售之產品在 EMC 方面仍符合規定。
* 以上文件必需一份置於 DoC 簽名負責人手中備查。

CE

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ADT CORP.

# CE Declaration of Conformity

For the following equipment:

(Product Name)

(Model Designation)

is herewith ccnfirmed to comply with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility (89/336/EEC), Low-voltage Directive (73/23/EEC) and the Amendment Directive (93/68/EEC). For the evaluation regarding the Directives, the following standards were applied:

The following importer/manufacturer is responsible for this declaration:

(Company Name, Importer)

(Company Address, Importer)

Person responsible for this declaration:

(Name, Surname, Importer)

(Position/Title)

(Legal Signature)

(Place) (Date)

(Company Name, Manufacturer)

(Company Address, Manufacturer)

Person responsible for this declaration:

(Name, Surname, Manufacturer)

(Position/Title)

(Legal Signature)

(Place) (Date)

# Certificate of Compliance

We, **ADVANCE DATA TECHNOLOGY CORP.**, hereby certify that:

The product : INDUSTRIAL PANEL COMPUTER

Trade Name : AAEON

Model No. : G3-15AX-00, G3-12AX-00, G3-10AX-00
(The "X" could be R or M depending on EUT's keyboard function)

Applicant : AAEON TECHNOLOGY INC.

Three samples (model: G3-15AM-00, G3-12AM-00, G3-10AR-00) of the designation have been tested in our facility from April 4 to 20, 2001. The test record, data evaluation and Equipment Under Test (EUT) configuration represented in our report No.: **CE90040203**, are in compliance with the following standards:

**EN 55022: 1998,Class A**
**EN 61000-3-2: 1995+A1: 1998+A2: 1998 , Class A**
**EN 61000-3-3: 1995**

**EN 50082-2: 1995**
EN 61000-4-2: 1995
EN 61000-4-3: 1996
EN 61000-4-4: 1995
EN 61000-4-6: 1996
EN 61000-4-8: 1993
ENV 50204: 1995

Mike Su / Manager

Issue Date: April 25, 2001

**ADVANCE DATA TECHNOLOGY CORP.**
ADT CORP.
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# CE EMC TEST REPORT

**REPORT NO.:** CE90040203

**MODEL NO.:** G3-15AX-00, G3-12AX-00, G3-10AX-00

**RECEIVED:** April 2, 2001

**TESTED:** April 4 ~ 20, 2001

**APPLICANT:** AAEON TECHNOLOGY INC.

**ADDRESS:** 1F, NO. 6, ALLEY 6, LANE 45, PAO-HSIN RD., HSIN-TIEN CITY, TAIPEI , TAIWAN, R.O.C.

**ISSUED BY:** Advance Data Technology Corporation

**LAB LOCATION:** 47 14th Lin, Chiapau Tsun, Linko, Taipei, Taiwan, R.O.C.



0528

Lab Code: 200102-0

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# 1 CERTIFICATION

| | | |
|---|---|---|
| **PRODUCT:** | INDUSTRIAL PANEL COMPUTER | |
| **BRAND NAME:** | AAEON | |
| **MODEL NO:** | G3-15AX-00, G3-12AX-00, G3-10AX-00 | |
| **TEST ITEM:** | ENGINEERING SAMPLE | |
| **APPLICANT:** | AAEON TECHNOLOGY INC. | |
| **STANDARDS:** | **EN 55022:1998, Class A** | **EN 50082-2: 1995** |
| | **EN 61000-3-2:1995+A1:1998** | EN 61000-4-2:1995 |
| | **+A2:1998, Class A** | EN 61000-4-3:1996 |
| | **EN 61000-3-3:1995** | EN 61000-4-4:1995 |
| | | EN 61000-4-6:1996 |
| | | EN 61000-4-8:1993 |
| | | ENV 50204:1995 |

We, **Advance Data Technology Corporation**, hereby certify that three samples (model: G3-15AM-00, G3-12AM-00, G3-10AR-00) of the designation have been tested in our facility from April 4 to 20, 2001. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions herein specified.

**CHECKED BY:** _____ , **DATE:** 4/25/2001
( Yemmy Soong )

**APPROVED BY:** _____ , **DATE:** 4/25/2001
(Mike Su, Manager )

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| EMISSION | | | |
|---|---|---|---|
| **Standard** | **Test Type** | **Result** | **Remarks** |
| EN 55022:1998 | Conducted Test | PASS | Meets Class A Limit Minimum passing margin is –21.51 dB at 0.534 MHz |
| | Conducted Test Telecom port | PASS | Meets Class A Limit Minimum passing margin is –2.01 dB at 10.001 MHz |
| | Radiated Test | PASS | Meets Class A Limit Minimum passing margin is –2.1 dB at 98.34 MHz |
| EN61000-3-2:1995 +A1:1998+A2:1998, Class A | Harmonic current emissions | PASS | Meets Class A Limit |
| EN61000-3-3:1995 | Voltage fluctuations & flicker | PASS | Meets the requirements. |

| IMMUNITY (EN 50082-2:1995) | | | |
|---|---|---|---|
| **Standard** | **Test Type** | **Result** | **Remarks** |
| EN 61000-4-2: 1995 | Electrostatic discharge immunity test | PASS | Meets the requirements of Performance Criterion A |
| EN 61000-4-3: 1996 | Radiated, radio-frequency, electromagnetic field immunity test | PASS | Meets the requirements of Performance Criterion A |
| EN 61000-4-4: 1995 | Electrical fast transient / burst immunity test. | PASS | Meets the requirements of Performance Criterion A |
| EN 61000-4-6: 1996 | Immunity to conducted disturbances, induced by radio-frequency fields | PASS | Meets the requirements of Performance Criterion A |
| EN 61000-4-8: 1993 | Power frequency magnetic field immunity test. | PASS | Meets the requirements of Performance Criterion A |
| ENV 50204: 1995 | Radio-Frequency Electromagnetic Field test. | PASS | Meets the requirements of Performance Criterion A |

# 3 GENERAL INFORMATION

## 3.1 GENERAL DESCRIPTION OF EUT

| | |
|---|---|
| **PRODUCT** | INDUSTRIAL PANEL COMPUTER |
| **MODEL NO.** | G3-15AX-00, G3-12AX-00, G3-10AX-00 |
| **POWER SUPPLY** | Switching<br>Power Cord:<br>Non-shielded, AC 3-pin (1.8m) |
| **DATA CABLE** | NA |

**NOTE**: The EUT has three model names, which are identical to each other except for their LCD panel and keyboard functions as the following:

- Model: G3-15AX-00: G-3000 PC Box + 15.0" LCD Panel
- Model: G3-12AX-00: G-3000 PC Box + 12.1" LCD Panel
- Model: G3-10AX-00: G-3000 PC Box + 10.4" LCD Panel

The "X" in model names could be "M" or "R" depending on the EUT's keyboard functions. "M" is to define EUT with membrane keyboard on its panel and "R" is to define EUT with touch screen type.

The EUT was configured with **G-3000 PC Box**, which consists of the following components:

| Components | Model & Brand Name |
|---|---|
| MOTHER BOARD | AAEON, model: PCM-6890 |
| CPU | Intel Celeron 400MHz |
| RAM | PC100 SDRAM, 64MB |
| FDD | NEC, model: FD1238T, 1.4MB |
| CD-ROM | NEC, model CD2800D, 24x |
| HDD | TOSHIBA, model: MK2109MA |

For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

## 3.2 DESCRIPTION OF TEST MODES

The EUT were pre-tested with the following six conditions:

| Condition | Model name | LCD Panel | Keyboard function |
|---|---|---|---|
| 1 | G3-15-AR-00 | HYUNDAI 15" LCD Panel, model: HT15X22-100 (resolution: 1024x768) | Touch screen, model: Dynapro 9584A |
| 2 | G3-15-AM-00 | HYUNDAI 15" LCD Panel, model: HT15X22-100 (resolution: 1024x768) | Membrane keyboard |
| 3 | G3-12-AR-00 | TOSHIBA 12.1" LCD Panel, model: LTM12C275A (resolution: 800x600) | Touch screen, model: Dynapro 9584A |
| 4 | G3-12-AM-00 | TOSHIBA 12.1" LCD Panel, model: LTM12C275A (resolution: 800x600) | Membrane keyboard |
| 5 | G3-10-AR-00 | NEC 10.4" LCD Panel, model: NL6448AC33-18 (resolution: 640x480) | Touch screen, model: Dynapro 9584A |
| 6 | G3-10-AM-00 | NEC 10.4" LCD Panel, model: NL6448AC33-18 (resolution: 640x480) | Membrane keyboard |

The worst emission level was found when the EUT were tested under the following three modes and their data are recorded in this report.

**MODE 1** – Model: G3-15AM-00
**MODE 2** – Model: G3-12AM-00
**MODE 3** – Model: G3-10AR-00

## 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a kind of ITE equipment and, according to the specifications of the manufacturers, must comply with the requirements of the following standards:

**EN 55022:1998, Class A**
**EN 61000-3-2:1995+ A1:1998+A2:1998, Class A**
**EN 61000-3-3:1995**

**EN 50082-2: 1995**
EN 61000-4-2:1995
EN 61000-4-3:1996
EN 61000-4-4:1995
EN 61000-4-6:1996
EN 61000-4-8:1993
ENV 50204:1995

All tests have been performed and recorded as per the above standards.

## 3.4 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 were used to form a representative test configuration during the tests.

### 3.4.1 FOR EMISSION TEST

| NO. | PRODUCT | BRAND | MODEL NO. | SERIAL NO. | FCC ID |
|---|---|---|---|---|---|
| 1 | 19"COLOR MONITOR | HP | D2842A | KR93473118 | BEJCB910 |
| 2 | PRINTER | HP | 2225C+ | 2936S56294 | DSI6XU2225 |
| 3 | MODEM | ACEEX | 1414 | 980020536 | IFAXDM1414 |
| 4 | MODEM | ACEEX | 1414 | 980020538 | IFAXDM1414 |
| 5 | MODEM | ACEEX | 1414 | 980020527 | IFAXDM1414 |
| 6 | KEYBOARD | FORWARD | FDA-104GA | FDKB8110116 | F4ZDA-104G |
| 7 | MOUSE | LOGITECH | M-S43 | LZE000703160 | DZL211106 |
| 8 | USB KEYBOARD | SiliconGraphis | SK-2502U | M990207207 | GYUR58SK |
| 9 | USB MOUSE | DEXIN | A2U800A | 71001825 | NIYA2U800A |
| 10 | CASSETTE PLAYER | ADITION | BS-722A | C0102026 | NA |
| 11 | MICROPHONE | CAROL | MUD-329 | M501012 | NA |
| 12 | SPEAKER | JAZZ HIPSTER | J-008 | J80391997 | NA |
| 13 | INDUSTRIAL PANEL COMPUTER | AAEON | P3-15AX-00 | NA | VERIFICATION |

| NO. | SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS |
|---|---|
| 1 | 1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core. |
| 2 | 1.2m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core. |
| 3 | 1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core. |
| 4 | 1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core. |
| 5 | 1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core. |
| 6 | 1.5 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core. |
| 7 | 1.8 m foil shielded wire, terminated with PS2 connector via drain wire, w/o core. |
| 8 | 2.9 m braid shielded wire, terminated with USB connector via drain wire, w/o core. |
| 9 | 1.5 m foil shielded wire, terminated with USB connector via drain wire, w/o core. |

| | |
|---|---|
| 10 | 1.8 m wrapped shield wire, terminated via drain wire, with 3.5 mm phone plug x 2, w/o core. |
| 11 | 2.8 m wrapped shielded wire, terminated via drain wire, with 3.5 mm phone plug, w/o core. |
| 12 | 1.1 m wrapped shielded wire, terminated via drain wire, with 3.5 mm phone plug, w/o core. |
| 13 | NA |

**NOTE:** 1. All power cords of the above support units are non shielded (1.8m).
2. The EUT acted as SERVER PC and communicated with support units 13 which acted as WORKSTATION and partners of communication system via a STP cable (10m)

## 3.4.2 FOR HARMONICS / FLICKER / IMMUNITY TEST

| NO. | PRODUCT | BRAND | MODEL NO. | SERIAL NO. | FCC ID |
|---|---|---|---|---|---|
| 1 | COLOR MONITOR | ACER | 7254e | 9171602008 | JVP7254E |
| 2 | PRINTER | HP | C2145A | SG59N16035 | B94C2145X |
| 3 | MODEM | GVC | F-1114V/R6 | 853E100 | DK4F1114VR6 |
| 4 | MODEM | GVC | F-1128V1R6 | 96-191-113004 | DK4F1128VR6 |
| 5 | MODEM | GVC | F-1128V1R6 | 96-191-113003 | DK4F1128VR6 |
| 6 | USB KEYBOARD | SiliconGraphis | SK-2502U | M990207208 | GYUR58SK |
| 7 | USB MOUSE | LOGITECH | M-BB48 | LZE93051102 | FCC DoC Approved |
| 8 | KEYBOARD (For Mode 3) | BTC | 5121W | A00800775 | E5XKB5121WTH0110 |
| 9 | PS/2 MOUSE (For Mode 3) | LOGITECH | M-S43 | LZE93501869 | DZL211106 |
| 10 | CASSETTE RECORDER | Panasonic | RQ-L309GT | C1-01-012 | NA |
| 11 | MICROPHONE | L | UDM-535 | M501011 | NA |
| 12 | Personal Computer | HP | BRIO BA410 | SG10602695 | FCC DoC Approved |
| 13 | MONITOR | ADI | 937G | 649015T00102094A | BR8937G |
| 14 | PS/2 KEYBOARD | HP | C3758A | C3758-60223 | CIGE03633 |
| 15 | MOUSE | LOGITECH | M-S43 | LZE00703283 | DZL211106 |
| 16 | LAN CARD | HP | EN1270D-TX-4A-18 | ACC000214435 | FCC DoC Approved |

| NO. | SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS |
|---|---|
| 1 | 1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core. |
| 2 | 1.2m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core. |
| 3 | 1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, |

| | |
|---|---|
| | w/o core. |
| 4 | 1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core. |
| 5 | 1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core. |
| 6 | 2.5 m braid shielded wire, terminated with USB connector via drain wire, w/o core. |
| 7 | 1.8 m foil shielded wire, terminated with USB connector via drain wire, w/o core. |
| 8 | 1.6 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core. |
| 9 | 1.8 m foil shielded wire, terminated with PS2 connector via drain wire, w/o core. |
| 10 | 1.5 m wrapped shield wire, terminated via drain wire, with 3.5 mm phone plug x 2, w/o core. |
| 11 | 2.2 m wrapped shielded wire, terminated via drain wire, with 3.5 mm phone plug, w/o core. |
| 12 | NA |
| 13 | 1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core. |
| 14 | 1.5 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core. |
| 15 | 1.5 m foil shielded wire, terminated with PS2 connector via drain wire, w/o core. |
| 16 | NA |

**NOTE:** 1. All power cords of the above support units are non shielded (1.8m).

2. The EUT acted as SERVER PC and communicated with support units 12 which acted as WORKSTATION and partners of communication system via a STP cable (10m)

# 4 EMISSION TEST

## 4.1 CONDUCTED EMISSION MEASUREMENT

### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

| 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 in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

(3) All emanations 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.

### 4.1.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|---|---|---|
| ROHDE & SCHWARZ Test Receiver | ESCS30 | 834115/016 | Feb. 21, 2002 |
| ROHDE & SCHWARZ Artificial Mains Network (For EUT) | ESH2-Z5 | 892107/003 | July 11, 2001 |
| ROHDE & SCHWARZ 4-wire ISN | ENY41 | 838119/028 | Dec. 12, 2001 |
| ROHDE & SCHWARZ 2-wire ISN | ENY22 | 837497/018 | Dec. 3, 2001 |
| EMCO L.I.S.N. (For peripherals) | 3825/2 | 9504-2359 | July 11, 2001 |
| Software | Cond-V2e | NA | NA |
| RF cable (JYEBAO) | RG-58A/U | Cable-C03.01 | July 11, 2001 |
| Terminator (For EMCO LISN) | NA | E1-01-300 | Feb. 20, 2002 |
| Terminator (For EMCO LISN) | NA | E1-01-301 | Feb. 20, 2002 |
| Shielded Room | Site 3 | ADT-C03 | NA |
| VCCI Site Registration No. | Site 3 | C-274 | NA |

**NOTE:** 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the 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.

## 4.1.3 TEST PROCEDURE

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

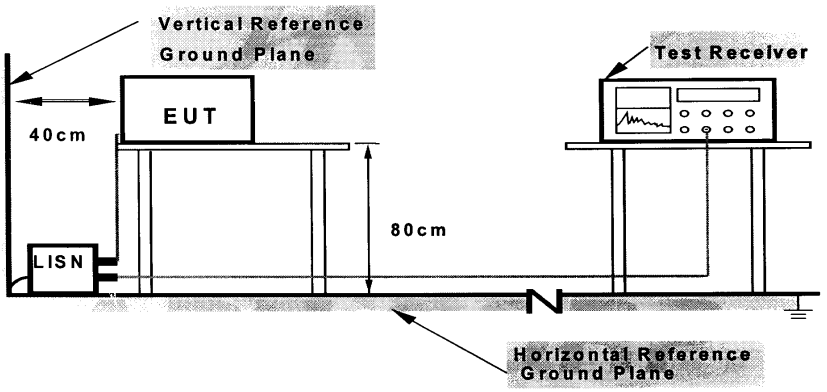
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported.

## 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

## 4.1.5 TEST SETUP




Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

### 4.1.6 EUT OPERATING CONDITIONS

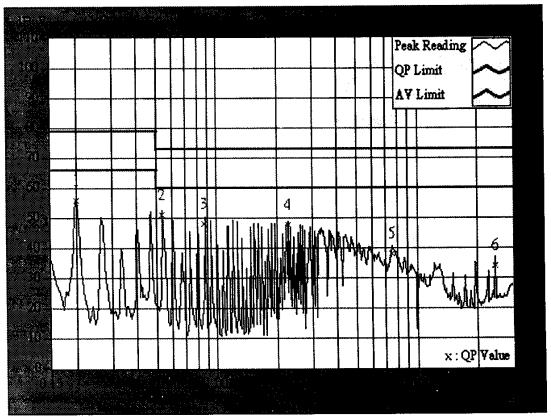
a. Turn on the power of all equipment.
b. INDUSTRIAL PANEL COMPUTER (EUT) and communication PC run a test program to enable all functions.
c. EUT transmits/and receives messages from the communication PC via STP cable, which connected EUT and communication PC.
d. EUT sends "H" messages to monitor and monitor displayed "H" patterns on screen.
e. EUT sends "H" messages to printer, then printer printed them on paper.
f. EUT sends "H" messages to modem.
g. EUT sends audio messages to speaker.
h. Repeat steps c-h.

## 4.1.7 TEST RESULTS (A)

| EUT | INDUSTRIAL PANEL COMPUTER | MODEL | G3-15AM-00 |
|---|---|---|---|
| MODE | 1 | 6dB BANDWIDTH | 10 kHz |
| INPUT POWER | 230Vac, 50 Hz | PHASE | Line (L) |
| ENVIRONMENTAL CONDITIONS | 20 deg. C, 80 % RH, 1050 hPa | TESTED BY: | JN Chen |

| No | Freq. | Corr. Factor | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.201 | 0.20 | 55.92 | - | 56.12 | - | 79.00 | 66.00 | -22.88 | - |
| 2 | 0.534 | 0.22 | 51.27 | - | 51.49 | - | 73.00 | 60.00 | -21.51 | - |
| 3 | 0.869 | 0.28 | 48.26 | - | 48.54 | - | 73.00 | 60.00 | -24.46 | - |
| 4 | 2.276 | 0.31 | 47.67 | - | 47.98 | - | 73.00 | 60.00 | -25.02 | - |
| 5 | 7.505 | 0.52 | 38.22 | - | 38.74 | - | 73.00 | 60.00 | -34.26 | - |
| 6 | 24.580 | 1.18 | 34.12 | - | 35.30 | - | 73.00 | 60.00 | -37.70 | - |

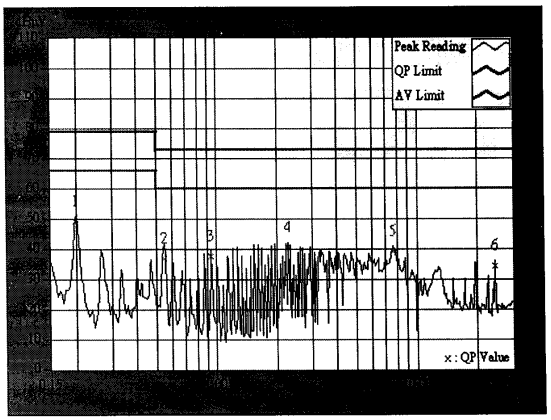
**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



| | | | |
|---|---|---|---|
| **EUT** | INDUSTRIAL PANEL COMPUTER | **MODEL** | G3-15AM-00 |
| **MODE** | 1 | **6dB BANDWIDTH** | 10 kHz |
| **INPUT POWER** | 230Vac, 50 Hz | **PHASE** | Neutral (N) |
| **ENVIRONMENTAL CONDITIONS** | 20 deg. C, 80 % RH, 1050 hPa | **TESTED BY:** | JN Chen |

| No | Freq. | Corr. Factor | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.199 | 0.20 | 49.33 | - | 49.53 | - | 79.00 | 66.00 | -29.47 | - |
| 2 | 0.551 | 0.23 | 36.96 | - | 37.19 | - | 73.00 | 60.00 | -35.81 | - |
| 3 | 0.937 | 0.29 | 37.70 | - | 37.99 | - | 73.00 | 60.00 | -35.01 | - |
| 4 | 2.276 | 0.31 | 40.58 | - | 40.89 | - | 73.00 | 60.00 | -32.11 | - |
| 5 | 7.565 | 0.46 | 39.12 | - | 39.58 | - | 73.00 | 60.00 | -33.42 | - |
| 6 | 24.581 | 0.79 | 34.38 | - | 35.17 | - | 73.00 | 60.00 | -37.83 | - |

**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.

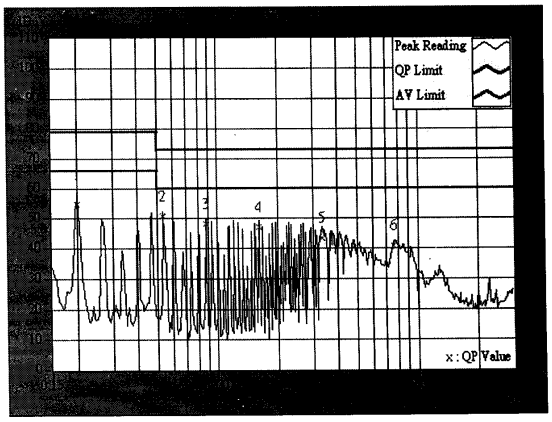


## 4.1.8 TEST RESULTS (B)

| EUT | INDUSTRIAL PANEL COMPUTER | MODEL | G3-12AM-00 |
|---|---|---|---|
| MODE | 2 | 6dB BANDWIDTH | 10 kHz |
| INPUT POWER | 230Vac, 50 Hz | PHASE | Line (L) |
| ENVIRONMENTAL CONDITIONS | 20 deg. C, 80 % RH, 1050 hPa | TESTED BY: | JN Chen |

| No | Freq. | Corr. Factor | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.201 | 0.20 | 54.81 | - | 55.01 | - | 79.00 | 66.00 | -23.99 | - |
| 2 | 0.537 | 0.22 | 50.82 | - | 51.04 | - | 73.00 | 60.00 | -21.96 | - |
| 3 | 0.873 | 0.28 | 48.17 | - | 48.45 | - | 73.00 | 60.00 | -24.55 | - |
| 4 | 1.609 | 0.30 | 47.16 | - | 47.46 | - | 73.00 | 60.00 | -25.54 | - |
| 5 | 3.352 | 0.37 | 43.32 | - | 43.69 | - | 73.00 | 60.00 | -29.31 | - |
| 6 | 7.566 | 0.52 | 40.73 | - | 41.25 | - | 73.00 | 60.00 | -31.75 | - |

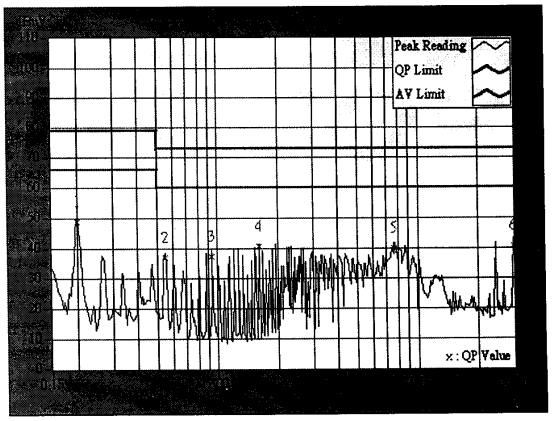
**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



| | | | |
|---|---|---|---|
| **EUT** | INDUSTRIAL PANEL COMPUTER | **MODEL** | G3-12AM-00 |
| **MODE** | 2 | **6dB BANDWIDTH** | 10 kHz |
| **INPUT POWER** | 230Vac, 50 Hz | **PHASE** | Neutral (N) |
| **ENVIRONMENTAL CONDITIONS** | 20 deg. C, 80 % RH, 1050 hPa | **TESTED BY:** | JN Chen |

| No | Freq. | Corr. Factor | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.201 | 0.20 | 48.82 | - | 49.02 | - | 79.00 | 66.00 | -29.98 | - |
| 2 | 0.548 | 0.22 | 37.15 | - | 37.37 | - | 73.00 | 60.00 | -35.63 | - |
| 3 | 0.939 | 0.29 | 37.37 | - | 37.66 | - | 73.00 | 60.00 | -35.34 | - |
| 4 | 1.609 | 0.30 | 40.71 | - | 41.01 | - | 73.00 | 60.00 | -31.99 | - |
| 5 | 7.566 | 0.46 | 39.87 | - | 40.33 | - | 73.00 | 60.00 | -32.67 | - |
| 6 | 30.000 | 0.70 | 40.89 | - | 41.59 | - | 73.00 | 60.00 | -31.41 | - |

**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.

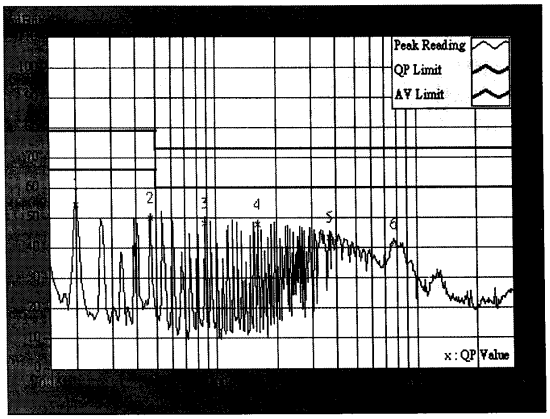


## 4.1.9 TEST RESULTS (C)

| EUT | INDUSTRIAL PANEL COMPUTER | MODEL | G3-10AR-00 |
|---|---|---|---|
| MODE | 3 | 6dB BANDWIDTH | 10 kHz |
| INPUT POWER | 230Vac, 50 Hz | PHASE | Line (L) |
| ENVIRONMENTAL CONDITIONS | 20 deg. C, 80 % RH, 1050 hPa | TESTED BY: | JN Chen |

| No | Freq. | Corr. Factor | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.201 | 0.20 | 54.29 | - | 54.49 | - | 79.00 | 66.00 | -24.51 | - |
| 2 | 0.470 | 0.21 | 50.16 | - | 50.37 | - | 79.00 | 66.00 | -28.63 | - |
| 3 | 0.873 | 0.28 | 48.13 | - | 48.41 | - | 73.00 | 60.00 | -24.59 | - |
| 4 | 1.609 | 0.30 | 47.66 | - | 47.96 | - | 73.00 | 60.00 | -25.04 | - |
| 5 | 3.688 | 0.38 | 43.20 | - | 43.58 | - | 73.00 | 60.00 | -29.42 | - |
| 6 | 7.746 | 0.52 | 41.19 | - | 41.71 | - | 73.00 | 60.00 | -31.29 | - |

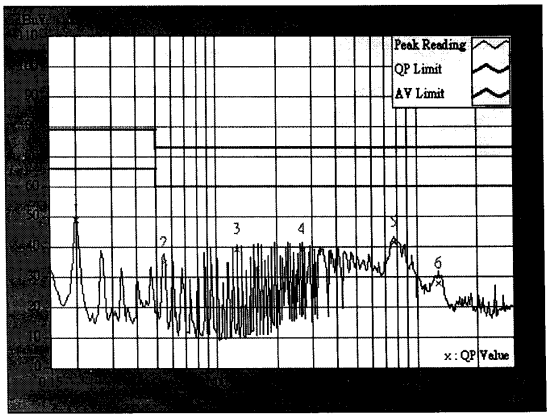
**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



| | | | |
|---|---|---|---|
| **EUT** | INDUSTRIAL PANEL COMPUTER | **MODEL** | G3-10AR-00 |
| **MODE** | 3 | **6dB BANDWIDTH** | 10 kHz |
| **INPUT POWER** | 230Vac, 50 Hz | **PHASE** | Neutral (N) |
| **ENVIRONMENTAL CONDITIONS** | 20 deg. C, 80 % RH, 1050 hPa | **TESTED BY:** | JN Chen |

| No | Freq. | Corr. Factor | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.201 | 0.20 | 49.05 | - | 49.25 | - | 79.00 | 66.00 | -29.75 | - |
| 2 | 0.548 | 0.22 | 34.71 | - | 34.93 | - | 73.00 | 60.00 | -38.07 | - |
| 3 | 1.273 | 0.30 | 39.27 | - | 39.57 | - | 73.00 | 60.00 | -33.43 | - |
| 4 | 2.680 | 0.33 | 39.31 | - | 39.64 | - | 73.00 | 60.00 | -33.36 | - |
| 5 | 7.746 | 0.46 | 41.31 | - | 41.77 | - | 73.00 | 60.00 | -31.23 | - |
| 6 | 12.793 | 0.50 | 27.67 | - | 28.17 | - | 73.00 | 60.00 | -44.83 | - |

**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



## 4.2 CONDUCTED EMISSION MEASUREMENT AT TELECOMMUNICATION PORTS

### 4.2.1 LIMIT OF CONDUCTED COMMON MODE DISTURBANCE AT TELECOMMUNICATION PORTS

**FOR CLASS A EQUIPMENT**

| FREQUENCY (MHz) | Voltage Limit (dBuV) | | Current Limit (dBuA) | |
|---|---|---|---|---|
| | Quasi-peak | Average | Quasi-peak | Average |
| 0.15 - 0.5 | 97 – 87 | 84 - 74 | 53 – 43 | 40 – 30 |
| 0.5 - 30.0 | 87 | 74 | 43 | 30 |

**FOR CLASS B EQUIPMENT**

| FREQUENCY (MHz) | Voltage Limit (dBuV) | | Current Limit (dBuA) | |
|---|---|---|---|---|
| | Quasi-peak | Average | Quasi-peak | Average |
| 0.15 - 0.5 | 84 - 74 | 74 - 64 | 40 – 30 | 30 – 20 |
| 0.5 - 30.0 | 74 | 64 | 30 | 20 |

**NOTE:** (1) The limits decrease linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

## 4.2.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|---|---|---|
| ROHDE & SCHWARZ Test Receiver | ESCS30 | 834115/016 | Feb. 21, 2002 |
| ROHDE & SCHWARZ Artificial Mains Network (For EUT) | ESH2-Z5 | 892107/003 | July 11, 2001 |
| ROHDE & SCHWARZ 4-wire ISN | ENY41 | 838119/028 | Dec. 12, 2001 |
| ROHDE & SCHWARZ 2-wire ISN | ENY22 | 837497/018 | Dec. 3, 2001 |
| EMCO L.I.S.N. (For peripherals) | 3825/2 | 9504-2359 | July 11, 2001 |
| Software | Cond-V2e | NA | NA |
| RF cable (JYEBAO) | RG-58A/U | Cable-C03.01 | July 11, 2001 |
| Terminator (For EMCO LISN) | NA | E1-01-300 | Feb. 20, 2002 |
| Terminator (For EMCO LISN) | NA | E1-01-301 | Feb. 20, 2002 |
| Shielded Room | Site 3 | ADT-C03 | NA |
| VCCI Site Registration No. | Site 3 | C-274 | NA |

**NOTE:** 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the 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.

## 4.2.3 TEST PROCEDURE

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room and connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN.

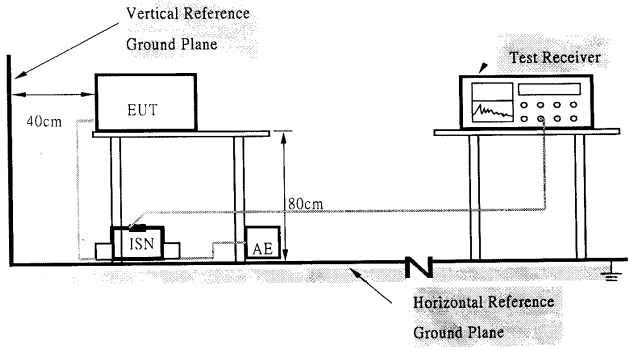
b. Voltage at the measurement port of the ISN was detected, the reading was corrected by adding the voltage division factor of the ISN, and was compared to the voltage limits.

c. The disturbance levels and the frequencies of at least six highest disturbances were recorded from each telecommunication port which comprises the EUT.

## 4.2.4 DEVIATION FROM TEST STANDARD

No deviation

## 4.2.5 TEST SETUP




Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) and ISN are 80 cm from EUT and at least 80 cm from other units and other metal planes support units.

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

**NOTE**:

1. The methods of conformance testing were selected according to the Alternative 1 (EN 55022: 1998, section: 9.5.1.1) or Alternative 2 (EN 55022: 1998, section: 9.5.1.2) of measurement method using an ISN with a longitudinal conversion loss (LCL) as defined in rule.
2. When measurements were performed on a single unscreened balanced pair, an adequate ISN for two wires were used; when performed on unscreened cables containing two balanced pairs, an adequate ISN for four wires were used.
3. The communication function of EUT was executed and ISN was connected between EUT and associated equipment and the ISN was connected directly to reference ground plane.

## 4.2.6 EUT OPERATING CONDITIONS

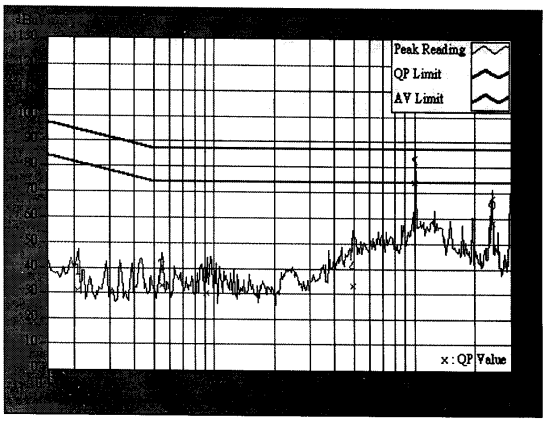
Same as 4.1.6.

## 4.2.7 TEST RESULTS (A)

| | | | |
|---|---|---|---|
| **EUT** | INDUSTRIAL PANEL COMPUTER | **MODEL** | G3-15AM-00 |
| **MODE** | 1 | **6dB BANDWIDTH** | 10 kHz |
| **INPUT POWER** | 230Vac, 50 Hz | **PHASE** | RJ45 TELECOM PORT (10 Mbps) |
| **ENVIRONMENTAL CONDITIONS** | 20 deg. C, 80 % RH, 1050 hPa | **TESTED BY:** | JN Chen |

| No | Freq. | Corr. Factor | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.208 | 10.54 | 30.89 | - | 41.43 | - | 94.30 | 81.30 | -52.87 | - |
| 2 | 0.547 | 10.54 | 33.33 | - | 43.87 | - | 87.00 | 74.00 | -43.13 | - |
| 3 | 0.916 | 10.51 | 30.00 | - | 40.51 | - | 87.00 | 74.00 | -46.49 | - |
| 4 | 4.920 | 10.57 | 33.29 | - | 43.86 | - | 87.00 | 74.00 | -43.14 | - |
| 5 | 10.001 | 10.65 | 74.09 | 51.17 | 84.74 | 61.82 | 87.00 | 74.00 | -2.26 | -12.18 |
| 6 | 24.578 | 10.88 | 58.43 | - | 69.31 | - | 87.00 | 74.00 | -17.69 | - |

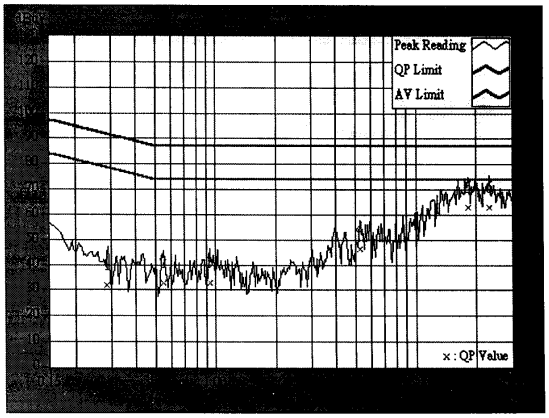
**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



| | | | |
|---|---|---|---|
| **EUT** | INDUSTRIAL PANEL COMPUTER | **MODEL** | G3-15AM-00 |
| **MODE** | 1 | **6dB BANDWIDTH** | 10 kHz |
| **INPUT POWER** | 230Vac, 50 Hz | **PHASE** | RJ45 TELECOM PORT (100 Mbps) |
| **ENVIRONMENTAL CONDITIONS** | 20 deg. C, 80 % RH, 1050 hPa | **TESTED BY:** | JN Chen |

| No | Freq. | Corr. Factor | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.288 | 10.54 | 31.79 | - | 42.33 | - | 91.58 | 78.58 | -49.25 | - |
| 2 | 0.549 | 10.54 | 32.97 | - | 43.51 | - | 87.00 | 74.00 | -43.49 | - |
| 3 | 0.933 | 10.51 | 32.61 | - | 43.12 | - | 87.00 | 74.00 | -43.88 | - |
| 4 | 5.237 | 10.57 | 46.56 | - | 57.13 | - | 87.00 | 74.00 | -29.87 | - |
| 5 | 18.243 | 10.73 | 63.07 | - | 73.80 | - | 87.00 | 74.00 | -13.20 | - |
| 6 | 23.131 | 10.85 | 63.05 | - | 73.90 | - | 87.00 | 74.00 | -13.10 | - |

**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.

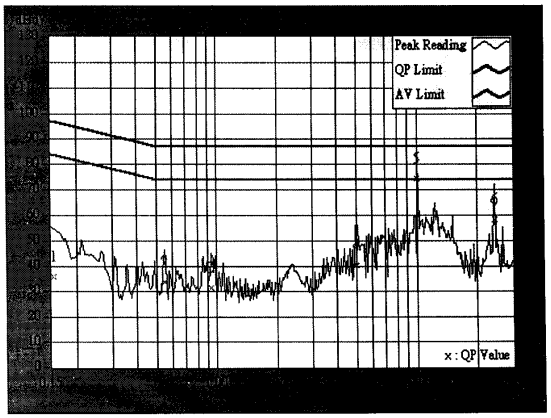


## 4.2.8 TEST RESULTS (B)

| | | | |
|---|---|---|---|
| **EUT** | INDUSTRIAL PANEL COMPUTER | **MODEL** | G3-12AM-00 |
| **MODE** | 2 | **6dB BANDWIDTH** | 10 kHz |
| **INPUT POWER** | 230Vac, 50 Hz | **PHASE** | RJ45 TELECOM PORT (10 Mbps) |
| **ENVIRONMENTAL CONDITIONS** | 20 deg. C, 80 % RH, 1050 hPa | **TESTED BY:** | JN Chen |

| No | Freq. | Corr. Factor | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.153 | 10.49 | 35.90 | - | 46.39 | - | 96.83 | 83.83 | -50.43 | - |
| 2 | 0.550 | 10.54 | 33.67 | - | 44.21 | - | 87.00 | 74.00 | -42.79 | - |
| 3 | 0.938 | 10.50 | 31.61 | - | 42.11 | - | 87.00 | 74.00 | -44.89 | - |
| 4 | 5.000 | 10.57 | 40.44 | - | 51.01 | - | 87.00 | 74.00 | -35.99 | - |
| 5 | 10.001 | 10.65 | 74.34 | 58.84 | 84.99 | 69.49 | 87.00 | 74.00 | -2.01 | -4.51 |
| 6 | 24.583 | 10.88 | 58.05 | - | 68.93 | - | 87.00 | 74.00 | -18.07 | - |

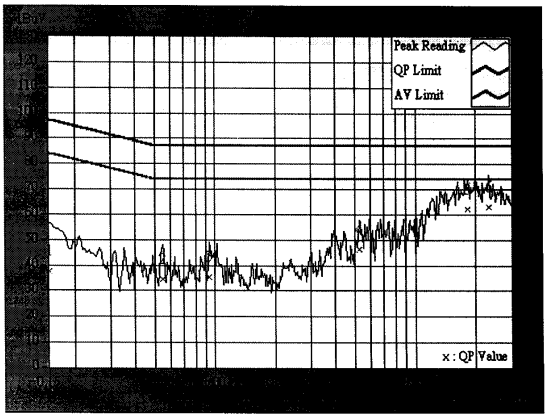
**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



| | | | |
|---|---|---|---|
| **EUT** | INDUSTRIAL PANEL COMPUTER | **MODEL** | G3-12AM-00 |
| **MODE** | 2 | **6dB BANDWIDTH** | 10 kHz |
| **INPUT POWER** | 230Vac, 50 Hz | **PHASE** | RJ45 TELECOM PORT (100 Mbps) |
| **ENVIRONMENTAL CONDITIONS** | 20 deg. C, 80 % RH, 1050 hPa | **TESTED BY:** | JN Chen |

| No | Freq. | Corr. Factor | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.150 | 10.49 | 37.65 | - | 48.14 | - | 97.00 | 84.00 | -48.86 | - |
| 2 | 0.547 | 10.54 | 34.59 | - | 45.13 | - | 87.00 | 74.00 | -41.87 | - |
| 3 | 0.933 | 10.51 | 35.56 | - | 46.07 | - | 87.00 | 74.00 | -40.93 | - |
| 4 | 5.235 | 10.57 | 46.46 | - | 57.03 | - | 87.00 | 74.00 | -29.97 | - |
| 5 | 18.242 | 10.73 | 62.01 | - | 72.74 | - | 87.00 | 74.00 | -14.26 | - |
| 6 | 23.130 | 10.85 | 63.13 | - | 73.98 | - | 87.00 | 74.00 | -13.02 | - |

**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.

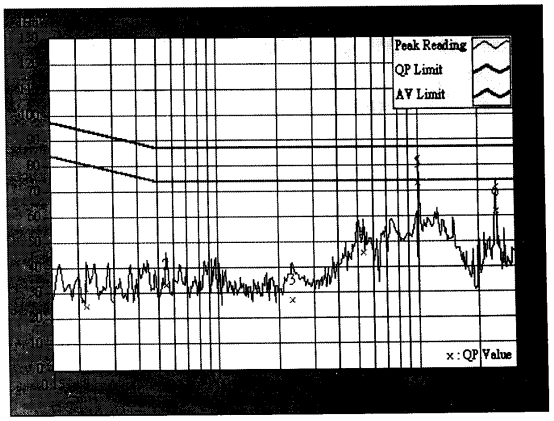


## 4.2.9 TEST RESULTS (C)

| EUT | INDUSTRIAL PANEL COMPUTER | MODEL | G3-10AR-00 |
|---|---|---|---|
| MODE | 3 | 6dB BANDWIDTH | 10 kHz |
| INPUT POWER | 230Vac, 50 Hz | PHASE | RJ45 TELECOM PORT (10 Mbps) |
| ENVIRONMENTAL CONDITIONS | 20 deg. C, 80 % RH, 1050 hPa | TESTED BY: | IN Chen |

| No | Freq. | Corr. Factor | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.220 | 10.54 | 24.93 | - | 35.47 | - | 93.81 | 80.81 | -58.34 | - |
| 2 | 0.550 | 10.54 | 33.34 | - | 43.88 | - | 87.00 | 74.00 | -43.12 | - |
| 3 | 2.342 | 10.48 | 27.14 | - | 37.62 | - | 87.00 | 74.00 | -49.38 | - |
| 4 | 5.329 | 10.57 | 45.68 | - | 56.25 | - | 87.00 | 74.00 | -30.75 | - |
| 5 | 10.001 | 10.65 | 73.14 | 53.67 | 83.79 | 64.32 | 87.00 | 74.00 | -3.21 | -9.68 |
| 6 | 24.580 | 10.88 | 61.88 | - | 72.76 | - | 87.00 | 74.00 | -14.24 | - |

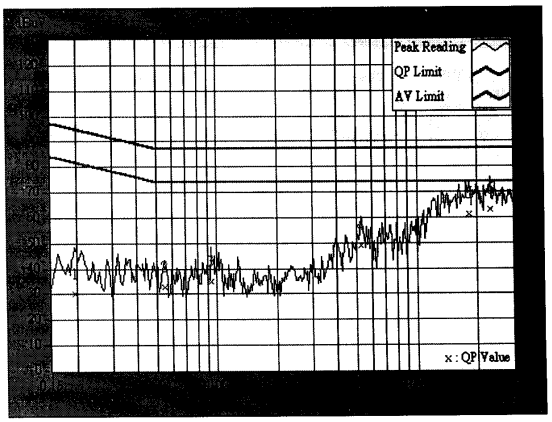
**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



| | | | |
|---|---|---|---|
| **EUT** | INDUSTRIAL PANEL COMPUTER | **MODEL** | G3-10AR-00 |
| **MODE** | 3 | **6dB BANDWIDTH** | 10 kHz |
| **INPUT POWER** | 230Vac, 50 Hz | **PHASE** | RJ45 TELECOM PORT (100 Mbps) |
| **ENVIRONMENTAL CONDITIONS** | 20 deg. C, 80 % RH, 1050 hPa | **TESTED BY:** | JN Chen |

| No | Freq. | Corr. Factor | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.197 | 10.54 | 30.32 | - | 40.86 | - | 94.74 | 81.74 | -53.88 | - |
| 2 | 0.548 | 10.54 | 32.93 | - | 43.47 | - | 87.00 | 74.00 | -43.53 | - |
| 3 | 0.931 | 10.51 | 34.91 | - | 45.42 | - | 87.00 | 74.00 | -41.58 | - |
| 4 | 5.237 | 10.57 | 49.17 | - | 59.74 | - | 87.00 | 74.00 | -27.26 | - |
| 5 | 18.242 | 10.73 | 61.45 | - | 72.18 | - | 87.00 | 74.00 | -14.82 | - |
| 6 | 23.130 | 10.85 | 63.10 | - | 73.95 | - | 87.00 | 74.00 | -13.05 | - |

**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



## 4.3 RADIATED EMISSION MEASUREMENT

### 4.3.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

**NOTE**: (1) The lower limit shall apply at the transition frequencies.
(2) Emission level (dBuV/m) = 20 log Emission level (uV/m).
(3) All emanations 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.

### 4.3.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|---|---|---|
| HP Spectrum Analyzer | 8594E | 3520A01861 | Feb. 12, 2002 |
| HP Preamplifier | 8447D | 2944A08118 | June 5, 2001 |
| * HP Preamplifier | 8449B | 3008A01201 | Dec. 13, 2001 |
| * ROHDE & SCHWARZ TEST RECEIVER | ESVS 10 | 840241/010 | Sept. 7, 2001 |
| SCHWARZBECK Tunable Dipole Antenna | VHA 9103<br>UHA 9105 | E101051<br>E101055 | Nov. 23, 2001 |
| * ROHDE & SCHWARZ TEST RECEIVER | ESMI | 839013/007<br>839379/002 | Jan. 25, 2002 |
| * CHASE BILOG Antenna | CBL6111A | 1501 | July 17, 2001 |
| * SCHWARZBECK Horn Antenna | BBHA9120-D1 | D130 | July 9, 2001 |
| * CHANCE Turn Table | U200 | 9701 | NA |
| * CHANCE Tower | AT-100 | CM-A003 | NA |
| * Software | AS61D | NA | NA |
| * ANRITSU RF Switches | MP59B | 6100034537 | July 17, 2001 |
| * TIMES RF cable | LMR-600 | CABLE-ST3-01 | July 17, 2001 |
| Open Field Test Site | Site 3 | ADT-R03 | July 14, 2001 |
| VCCI Site Registration No. | Site 3 | R-269 | NA |

**NOTE:** 1.The measurement uncertainty is less than +/- 3.0dB, which is calculated as per the 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. "*" = These equipment are used for the final measurement.

### 4.3.3 TEST PROCEDURE

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10-meter open field site. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarization of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the turn table was turned from 0 degrees to 360 degrees to find the maximum reading.

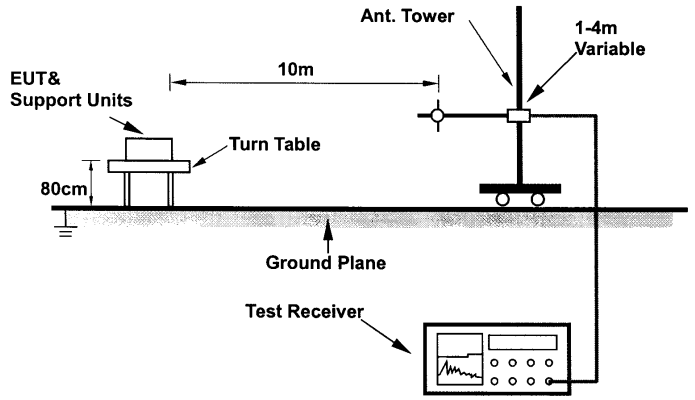
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using the quasi- peak method or average method as specified and then reported In Data sheet peak mode and QP mode.

### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation

## 4.3.5 TEST SETUP




For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

## 4.3.6 EUT OPERATING CONDITIONS

Same as 4.1.6.

## 4.3.7 TEST RESULTS (A)

| | | | |
|---|---|---|---|
| **EUT** | INDUSTRIAL PANEL COMPUTER | **MODEL** | G3-15AM-00 |
| **MODE** | 1 | **FREQUENCY RANGE** | 30-1000 MHz |
| **INPUT POWER** | 230Vac, 50 Hz | **DETECTOR FUNCTION & BANDWIDTH** | Quasi-Peak, 120kHz |
| **ENVIRONMENTAL CONDITIONS** | 20 deg. C, 80 % RH, 1050 hPa | **TESTED BY:** | JN Chen |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 10 M | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB/m) |
| 1 | 49.17 | 25.3 QP | 40.00 | -14.70 | 4.00H | 341 | 15.06 | 8.81 | 1.40 | 0.00 | -10.21 |
| 2 | 98.32 | 27.8 QP | 40.00 | -12.20 | 4.00H | 136 | 16.69 | 9.57 | 1.49 | 0.00 | -11.06 |
| 3 | 110.45 | 25.1 QP | 40.00 | -14.90 | 4.00H | 334 | 13.16 | 10.34 | 1.61 | 0.00 | -11.95 |
| 4 | 116.95 | 28.9 QP | 40.00 | -11.10 | 4.00H | 177 | 16.67 | 10.59 | 1.68 | 0.00 | -12.27 |
| 5 | 153.88 | 28.6 QP | 40.00 | -11.40 | 4.00H | 0 | 17.25 | 9.60 | 1.78 | 0.00 | -11.38. |
| 6 | 195.00 | 24.1 QP | 40.00 | -15.90 | 4.00H | 24 | 14.21 | 8.01 | 1.93 | 0.00 | -9.94. |
| 7 | 200.44 | 26.7 QP | 40.00 | -13.30 | 4.00H | 283 | 16.74 | 8.03 | 1.94 | 0.00 | -9.97 |
| 8 | 218.83 | 31.2 QP | 40.00 | -8.80 | 4.00H | 117 | 19.80 | 9.45 | 1.98 | 0.00 | -11.43 |
| 9 | 227.45 | 34.9 QP | 40.00 | -5.10 | 4.00H | 76 | 22.86 | 9.99 | 2.00 | 0.00 | -11.99 |
| 10 | 236.09 | 33.3 QP | 47.00 | -13.70 | 4.00H | 252 | 20.53 | 10.71 | 2.02 | 0.00 | -12.73 |
| 11 | 316.25 | 35.0 QP | 47.00 | -12.00 | 4.00H | 240 | 19.69 | 13.06 | 2.31 | 0.00 | -15.36 |
| 12 | 496.10 | 33.5 QP | 47.00 | -13.50 | 1.64H | 307 | 13.27 | 17.65 | 2.58 | 0.00 | -20.22 |
| 13 | 601.28 | 33.5 QP | 47.00 | -13.50 | 1.00H | 342 | 11.38 | 19.60 | 2.52 | 0.00 | -22.11 |

**REMARKS**:
1. Emission level(dBuV/m)=Raw Value(dBuV) – Correction Factor(dB)
2. Correction Factor(dB/m) = Pre-Amplifier Factor (dB) - Antenna Factor (dB/m) - Cable Factor (dB)
3. Pre-Amplifier Factor (dB) = 0, when the test receiver is used to read the value and because it did not use the Pre-Amplifier.
4. The other emission levels were very low against the limit.
5. Margin value = Emission level – Limit value.

| | | | |
|---|---|---|---|
| **EUT** | INDUSTRIAL PANEL COMPUTER | **MODEL** | G3-15AM-00 |
| **MODE** | 1 | **FREQUENCY RANGE** | 30-1000 MHz |
| **INPUT POWER** | 230Vac, 50 Hz | **DETECTOR FUNCTION & BANDWIDTH** | Quasi-Peak, 120kHz |
| **ENVIRONMENTAL CONDITIONS** | 20 deg. C, 80 % RH, 1050 hPa | **TESTED BY:** | JN Chen |

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 10 M**

| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB/m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 49.17 | 37.7 QP | 40.00 | -2.30 | 1.21V | 5 | 27.49 | 8.81 | 1.40 | 0.00 | -10.21 |
| 2 | 98.34 | 37.9 QP | 40.00 | -2.10 | 1.00V | 254 | 26.84 | 9.57 | 1.49 | 0.00 | -11.06 |
| 3 | 110.47 | 32.2 QP | 40.00 | -7.80 | 1.00V | 74 | 20.25 | 10.34 | 1.61 | 0.00 | -11.95 |
| 4 | 153.79 | 30.2 QP | 40.00 | -9.80 | 1.00V | 322 | 18.82 | 9.60 | 1.78 | 0.00 | -11.38 |
| 5 | 167.03 | 24.2 QP | 40.00 | -15.80 | 1.00V | 26 | 13.77 | 8.61 | 1.83 | 0.00 | -10.43 |
| 6 | 200.40 | 23.3 QP | 40.00 | -16.70 | 1.00V | 14 | 13.33 | 8.03 | 1.94 | 0.00 | -9.97 |
| 7 | 218.77 | 35.2 QP | 40.00 | -4.80 | 1.00V | 356 | 23.77 | 9.45 | 1.98 | 0.00 | -11.43 |
| 8 | 227.44 | 33.4 QP | 40.00 | -6.60 | 1.00V | 306 | 21.41 | 9.99 | 2.00 | 0.00 | -11.99 |
| 9 | 235.95 | 34.3 QP | 47.00 | -12.70 | 1.00V | 317 | 21.57 | 10.71 | 2.02 | 0.00 | -12.73 |
| 10 | 464.26 | 35.3 QP | 47.00 | -11.70 | 2.98V | 1 | 16.19 | 16.76 | 2.34 | 0.00 | -19.11 |

**REMARKS**:
1. Emission level(dBuV/m)=Raw Value(dBuV) – Correction Factor(dB)
2. Correction Factor(dB/m) = Pre-Amplifier Factor (dB) - Antenna Factor (dB/m) - Cable Factor (dB)
3. Pre-Amplifier Factor (dB) = 0, when the test receiver is used to read the value and because it did not use the Pre-Amplifier.
4. The other emission levels were very low against the limit.
5. Margin value = Emission level – Limit value.

## 4.3.8 TEST RESULTS (B)

| | | | |
|---|---|---|---|
| **EUT** | INDUSTRIAL PANEL COMPUTER | **MODEL** | G3-12AM-00 |
| **MODE** | 2 | **FREQUENCY RANGE** | 30-1000 MHz |
| **INPUT POWER** | 230Vac, 50 Hz | **DETECTOR FUNCTION & BANDWIDTH** | Quasi-Peak, 120kHz |
| **ENVIRONMENTAL CONDITIONS** | 20 deg. C, 80 % RH, 1050 hPa | **TESTED BY:** | JN Chen |

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 10 M**

| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB/m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 49.16 | 32.7 QP | 40.00 | -7.30 | 4.00H | 345 | 22.51 | 8.81 | 1.40 | 0.00 | -10.21 |
| 2 | 98.32 | 29.3 QP | 40.00 | -10.70 | 4.00H | 342 | 18.27 | 9.57 | 1.49 | 0.00 | -11.06 |
| 3 | 138.07 | 32.6 QP | 40.00 | -7.40 | 4.00H | 109 | 20.13 | 10.74 | 1.79 | 0.00 | -12.52 |
| 4 | 153.41 | 21.4 QP | 40.00 | -18.60 | 4.00H | 251 | 10.01 | 9.60 | 1.78 | 0.00 | -11.38 |
| 5 | 195.60 | 26.2 QP | 40.00 | -13.80 | 4.00H | 59 | 16.27 | 8.01 | 1.93 | 0.00 | -9.94 |
| 6 | 200.43 | 25.1 QP | 40.00 | -14.90 | 4.00H | 326 | 15.14 | 8.03 | 1.94 | 0.00 | -9.98 |
| 7 | 230.10 | 25.3 QP | 47.00 | -21.70 | 4.00H | 5 | 12.90 | 10.35 | 2.01 | 0.00 | -12.36 |

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 10 M**

| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB/m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 49.17 | 37.3 QP | 40.00 | -2.70 | 2.62V | 65 | 27.13 | 8.81 | 1.40 | 0.00 | -10.21 |
| 2 | 53.70 | 36.8 QP | 40.00 | -3.20 | 2.40V | 36 | 28.47 | 6.92 | 1.40 | 0.00 | -8.33 |
| 3 | 98.31 | 35.0 QP | 40.00 | -5.00 | 1.00V | 311 | 23.94 | 9.57 | 1.49 | 0.00 | -11.06 |
| 4 | 111.24 | 30.6 QP | 40.00 | -9.40 | 1.00V | 1 | 18.58 | 10.42 | 1.63 | 0.00 | -12.05 |
| 5 | 130.39 | 28.4 QP | 40.00 | -11.60 | 1.00V | 0 | 15.91 | 10.71 | 1.74 | 0.00 | -12.47 |
| 6 | 167.03 | 29.3 QP | 40.00 | -10.70 | 1.00V | 318 | 18.88 | 8.61 | 1.83 | 0.00 | -10.43 |
| 7 | 195.60 | 24.3 QP | 40.00 | -15.70 | 1.00V | 5 | 14.35 | 8.01 | 1.93 | 0.00 | -9.94 |
| 8 | 225.73 | 23.3 QP | 40.00 | -16.70 | 1.00V | 347 | 11.33 | 9.99 | 2.00 | 0.00 | -11.99 |
| 9 | 231.93 | 26.9 QP | 47.00 | -20.10 | 1.00V | 80 | 14.59 | 10.35 | 2.01 | 0.00 | -12.36 |

**REMARKS**:
1. Emission level(dBuV/m)=Raw Value(dBuV) – Correction Factor(dB)
2. Correction Factor(dB/m) = Pre-Amplifier Factor (dB) - Antenna Factor (dB/m) - Cable Factor (dB)
3. Pre-Amplifier Factor (dB) = 0, when the test receiver is used to read the value and because it did not use the Pre-Amplifier.
4. The other emission levels were very low against the limit.
5. Margin value = Emission level – Limit value.

## 4.3.9 TEST RESULTS (C)

| | | | |
|---|---|---|---|
| **EUT** | INDUSTRIAL PANEL COMPUTER | **MODEL** | G3-10AR-00 |
| **MODE** | 3 | **FREQUENCY RANGE** | 30-1000 MHz |
| **INPUT POWER** | 230Vac, 50 Hz | **DETECTOR FUNCTION & BANDWIDTH** | Quasi-Peak, 120kHz |
| **ENVIRONMENTAL CONDITIONS** | 20 deg. C, 80 % RH, 1050 hPa | **TESTED BY:** | JN Chen |

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 10 M**

| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB/m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 49.16 | 25.5 QP | 40.00 | -14.50 | 4.00H | 330 | 15.32 | 8.81 | 1.40 | 0.00 | -10.21 |
| 2 | 98.33 | 26.9 QP | 40.00 | -13.10 | 4.00H | 84 | 15.82 | 9.57 | 1.49 | 0.00 | -11.06 |
| 3 | 122.92 | 27.1 QP | 40.00 | -12.90 | 4.00H | 268 | 14.66 | 10.70 | 1.71 | 0.00 | -12.41 |
| 4 | 159.80 | 27.1 QP | 40.00 | -12.90 | 4.00H | 66 | 16.32 | 9.02 | 1.79 | 0.00 | -10.80 |
| 5 | 223.72 | 31.8 QP | 40.00 | -8.20 | 4.00H | 358 | 19.95 | 9.81 | 1.99 | 0.00 | -11.80 |
| 6 | 270.35 | 25.7 QP | 47.00 | -21.30 | 4.00H | 52 | 11.63 | 12.04 | 2.01 | 0.00 | -14.05 |
| 7 | 351.56 | 35.2 QP | 47.00 | -11.80 | 1.63H | 334 | 18.79 | 13.91 | 2.47 | 0.00 | -16.39 |
| 8 | 368.70 | 32.7 QP | 47.00 | -14.30 | 3.23H | 308 | 15.49 | 14.67 | 2.50 | 0.00 | -17.17 |
| 9 | 415.49 | 34.4 QP | 47.00 | -12.60 | 1.56H | 90 | 15.83 | 16.14 | 2.45 | 0.00 | -18.59 |

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 10 M**

| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB/m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 49.15 | 36.6 QP | 40.00 | -3.40 | 1.00V | 5 | 26.38 | 8.81 | 1.40 | 0.00 | -10.21 |
| 2 | 98.31 | 35.6 QP | 40.00 | -4.40 | 1.00V | 262 | 24.59 | 9.57 | 1.49 | 0.00 | -11.06 |
| 3 | 122.91 | 33.8 QP | 40.00 | -6.20 | 1.00V | 73 | 21.35 | 10.70 | 1.71 | 0.00 | -12.41 |
| 4 | 159.81 | 32.3 QP | 40.00 | -7.70 | 1.00V | 321 | 21.50 | 9.02 | 1.79 | 0.00 | -10.80 |
| 5 | 223.75 | 29.7 QP | 40.00 | -10.30 | 1.00V | 116 | 17.94 | 9.81 | 1.99 | 0.00 | -11.80 |
| 6 | 270.78 | 26.9 QP | 47.00 | -20.10 | 1.00V | 265 | 12.87 | 12.04 | 2.01 | 0.00 | -14.05 |
| 7 | 351.57 | 32.2 QP | 47.00 | -14.80 | 1.00V | 257 | 15.83 | 13.91 | 2.47 | 0.00 | -16.39 |
| 8 | 368.72 | 31.7 QP | 47.00 | -15.30 | 1.00V | 132 | 14.57 | 14.67 | 2.50 | 0.00 | -17.17 |
| 9 | 415.50 | 32.4 QP | 47.00 | -14.60 | 1.00V | 288 | 13.85 | 16.14 | 2.45 | 0.00 | -18.58 |

**REMARKS**:
1. Emission level(dBuV/m)=Raw Value(dBuV) – Correction Factor(dB)
2. Correction Factor(dB/m) = Pre-Amplifier Factor (dB) - Antenna Factor (dB/m) - Cable Factor (dB)
3. Pre-Amplifier Factor (dB) = 0, when the test receiver is used to read the value and because it did not use the Pre-Amplifier.
4. The other emission levels were very low against the limit.
5. Margin value = Emission level – Limit value.

## 4.4 HARMONICS CURRENT MEASUREMENT

### 4.4.1 LIMITS OF HARMONICS CURRENT MEASUREMENT

| Limits for Class A equipment | |
|---|---|
| Harmonics Order n | Max. permissible harmonics current A |
| Odd harmonics | |
| 3 | 2.30 |
| 5 | 1.14 |
| 7 | 0.77 |
| 9 | 0.40 |
| 11 | 0.33 |
| 13 | 0.21 |
| 15<=n<=39 | 0.15x15/n |
| Even harmonics | |
| 2 | 1.08 |
| 4 | 0.43 |
| 6 | 0.30 |
| 8<=n<=40 | 0.23x8/n |

| Limits for Class D equipment | | |
|---|---|---|
| Harmonics Order n | Max. permissible harmonics current per watt mA/W | Max. permissible harmonics current A |
| Odd Harmonics only | | |
| 3 | 3.4 | 2.30 |
| 5 | 1.9 | 1.14 |
| 7 | 1.0 | 0.77 |
| 9 | 0.5 | 0.40 |
| 11 | 0.35 | 0.33 |
| 13 | 0.30 | 0.21 |
| 15<=n<=39 | 3.85/n | 0.15x15/n |
| | | |
| | | |
| | | |
| | | |
| | | |

**NOTE:** 1. Class A and Class D are judged by test equipment automatically as per Section 5 of EN 61000-3-2:1995.

2. The above limits for Class D equipment are for all applications having an active input power > 75 W. No limits apply for equipment with an active input power up to and including 75 W.

### 4.4.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|---|---|---|
| KeyTek, Power Arb Waveform Generator | EP72HF | 9508346 | April 20, 2002 |
| KIKUSUI AC SWITCHING POWER SUPPLY | PCR 4000L | 9508355 | April 20, 2002 |

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

## 4.4.3 TEST PROCEDURE

a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.

b. The classification of EUT is according to section 5 of EN 61000-3-2:1995.

The EUT is classified as follows:

Class A: Balanced three-phase equipment and all other equipment, except that stated in one of the following classes.

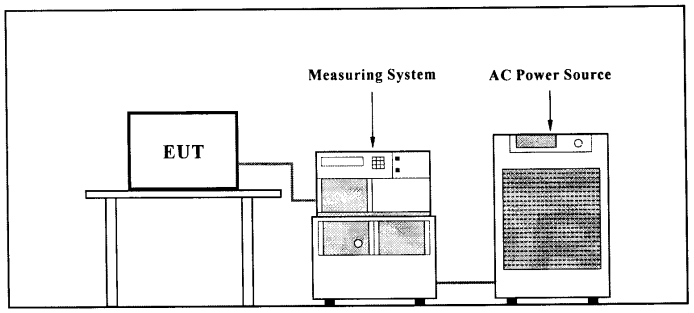
Class B: Portable tools.

Class C: Lighting equipment, including dimming devices.

Class D: Equipment having an input current with "special wave shape" and an active input power, P <= 600 W

c. The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.

## 4.4.4 TEST SETUP




For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

## 4.4.5 EUT OPERATING CONDITIONS

Same as 4.1.6.

## 4.4.6 TEST RESULTS (A)

| EUT | INDUSTRIAL PANEL COMPUTER | MODEL | G3-15AM-00 |
|---|---|---|---|
| MODE | 1 | | |
| FUNDAMENTAL VOLTAGE/AMPERE | 229.631 Vrms/ 0.614 Arms | POWER FREQUENCY | 50.000 Hz |
| POWER CONSUMPTION | 66.406 W | POWER FACTOR | 0.471 |
| ENVIRONMENTAL CONDITIONS | 20 deg. C, 50 % RH, 1050 hPa | TESTED BY: | Joyce Chen |

| Harm. Order | Reading Data (A) | Limit (A) |
|---|---|---|
| 1 | - | - |
| 3 | 0.28 | 2.30 |
| 5 | 0.26 | 1.14 |
| 7 | 0.23 | 0.77 |
| 9 | 0.20 | 0.40 |
| 11 | 0.16 | 0.33 |
| 13 | 0.13 | 0.21 |
| 15 | 0.09 | 0.15 |
| 17 | 0.06 | 0.13 |
| 19 | 0.03 | 0.12 |
| 21 | 0.02 | 0.11 |
| 23 | 0.02 | 0.10 |
| 25 | 0.02 | 0.09 |
| 27 | 0.03 | 0.08 |
| 29 | 0.02 | 0.08 |
| 31 | 0.02 | 0.07 |
| 33 | 0.02 | 0.07 |
| 35 | 0.01 | 0.06 |
| 37 | 0.00 | 0.06 |
| 39 | 0.01 | 0.06 |

| Harm. Order | Reading Data (A) | Limit (A) |
|---|---|---|
| 2 | 0.00 | 1.08 |
| 4 | 0.00 | 0.43 |
| 6 | 0.00 | 0.30 |
| 8 | 0.00 | 0.23 |
| 10 | 0.00 | 0.18 |
| 12 | 0.00 | 0.15 |
| 14 | 0.00 | 0.13 |
| 16 | 0.00 | 0.11 |
| 18 | 0.00 | 0.10 |
| 20 | 0.00 | 0.09 |
| 22 | 0.00 | 0.08 |
| 24 | 0.00 | 0.08 |
| 26 | 0.00 | 0.07 |
| 28 | 0.00 | 0.07 |
| 30 | 0.00 | 0.06 |
| 32 | 0.00 | 0.06 |
| 34 | 0.00 | 0.05 |
| 36 | 0.00 | 0.05 |
| 38 | 0.00 | 0.05 |
| 40 | 0.00 | 0.05 |

**NOTE:** Steady state values on AC mains are recorded in the table.

## 4.4.7 TEST RESULTS (B)

| EUT | INDUSTRIAL PANEL COMPUTER | MODEL | G3-12AM-00 |
|---|---|---|---|
| MODE | 2 | | |
| FUNDAMENTAL VOLTAGE/AMPERE | 229.510 Vrms/ 0.562 Arms | POWER FREQUENCY | 50.000 Hz |
| POWER CONSUMPTION | 60.839 W | POWER FACTOR | 0.472 |
| ENVIRONMENTAL CONDITIONS | 20 deg. C, 50 % RH, 1050 hPa | TESTED BY: | Joyce Chen |

| Harm. Order | Reading Data (A) | Limit (A) |
|---|---|---|
| 1 | - | - |
| 3 | 0.25 | 2.30 |
| 5 | 0.23 | 1.14 |
| 7 | 0.21 | 0.77 |
| 9 | 0.18 | 0.40 |
| 11 | 0.15 | 0.33 |
| 13 | 0.12 | 0.21 |
| 15 | 0.09 | 0.15 |
| 17 | 0.06 | 0.13 |
| 19 | 0.03 | 0.12 |
| 21 | 0.01 | 0.11 |
| 23 | 0.01 | 0.10 |
| 25 | 0.02 | 0.09 |
| 27 | 0.02 | 0.08 |
| 29 | 0.02 | 0.08 |
| 31 | 0.02 | 0.07 |
| 33 | 0.01 | 0.07 |
| 35 | 0.01 | 0.06 |
| 37 | 0.00 | 0.06 |
| 39 | 0.01 | 0.06 |

| Harm. Order | Reading Data (A) | Limit (A) |
|---|---|---|
| 2 | 0.00 | 1.08 |
| 4 | 0.00 | 0.43 |
| 6 | 0.00 | 0.30 |
| 8 | 0.00 | 0.23 |
| 10 | 0.00 | 0.18 |
| 12 | 0.00 | 0.15 |
| 14 | 0.00 | 0.13 |
| 16 | 0.00 | 0.11 |
| 18 | 0.00 | 0.10 |
| 20 | 0.00 | 0.09 |
| 22 | 0.00 | 0.08 |
| 24 | 0.00 | 0.08 |
| 26 | 0.00 | 0.07 |
| 28 | 0.00 | 0.07 |
| 30 | 0.00 | 0.06 |
| 32 | 0.00 | 0.06 |
| 34 | 0.00 | 0.05 |
| 36 | 0.00 | 0.05 |
| 38 | 0.00 | 0.05 |
| 40 | 0.00 | 0.05 |

**NOTE:** Steady state values on AC mains are recorded in the table.

## 4.4.8 TEST RESULTS (C)

| EUT | INDUSTRIAL PANEL COMPUTER | MODEL | G3-10AR-00 |
|---|---|---|---|
| MODE | 3 | | |
| FUNDAMENTAL VOLTAGE/AMPERE | 229.636 Vrms/ 0.515 Arms | POWER FREQUENCY | 50.000 Hz |
| POWER CONSUMPTION | 55.307 W | POWER FACTOR | 0.468 |
| ENVIRONMENTAL CONDITIONS | 20 deg. C, 50 % RH, 1050 hPa | TESTED BY: | Joyce Chen |

| Harm. Order | Reading Data (A) | Limit (A) |
|---|---|---|
| 1 | - | - |
| 3 | 0.22 | 2.30 |
| 5 | 0.21 | 1.14 |
| 7 | 0.19 | 0.77 |
| 9 | 0.17 | 0.40 |
| 11 | 0.14 | 0.33 |
| 13 | 0.11 | 0.21 |
| 15 | 0.08 | 0.15 |
| 17 | 0.06 | 0.13 |
| 19 | 0.03 | 0.12 |
| 21 | 0.02 | 0.11 |
| 23 | 0.01 | 0.10 |
| 25 | 0.02 | 0.09 |
| 27 | 0.02 | 0.08 |
| 29 | 0.02 | 0.08 |
| 31 | 0.02 | 0.07 |
| 33 | 0.01 | 0.07 |
| 35 | 0.01 | 0.06 |
| 37 | 0.01 | 0.06 |
| 39 | 0.00 | 0.06 |

| Harm. Order | Reading Data (A) | Limit (A) |
|---|---|---|
| 2 | 0.00 | 1.08 |
| 4 | 0.00 | 0.43 |
| 6 | 0.00 | 0.30 |
| 8 | 0.00 | 0.23 |
| 10 | 0.00 | 0.18 |
| 12 | 0.00 | 0.15 |
| 14 | 0.00 | 0.13 |
| 16 | 0.00 | 0.11 |
| 18 | 0.00 | 0.10 |
| 20 | 0.00 | 0.09 |
| 22 | 0.00 | 0.08 |
| 24 | 0.00 | 0.08 |
| 26 | 0.00 | 0.07 |
| 28 | 0.00 | 0.07 |
| 30 | 0.00 | 0.06 |
| 32 | 0.00 | 0.06 |
| 34 | 0.00 | 0.05 |
| 36 | 0.00 | 0.05 |
| 38 | 0.00 | 0.05 |
| 40 | 0.00 | 0.05 |

**NOTE:** Steady state values on AC mains are recorded in the table.

## 4.5 VOLTAGE FLUCTUATION AND FLICKS MEASUREMENT

## 4.6 LIMITS OF VOLTAGE FLUCTUATION AND FLICKS MEASUREMENT

| TEST ITEM | LIMIT | NOTE |
|---|---|---|
| $P_{st}$ | 1.0 | $P_{st}$ means short-term flicker indicator. |
| $P_{lt}$ | 0.65 | $P_{lt}$ means long-term flicker indicator. |
| $T_{dt}$ (ms) | 200 | $T_{dt}$ means maximum time that dt exceeds 3 %. |
| $d_{max}$ (%) | 4% | $d_{max}$ means maximum relative voltage change. |
| dc (%) | 3% | dc means relative steady-state voltage change |

### 4.6.1 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|---|---|---|
| KeyTek, Power Arb Waveform Generator | EP72HF | 9508346 | April 20, 2002 |
| KIKUSUI AC SWITCHING POWER SUPPLY | PCR 4000L | 9508355 | April 20, 2002 |

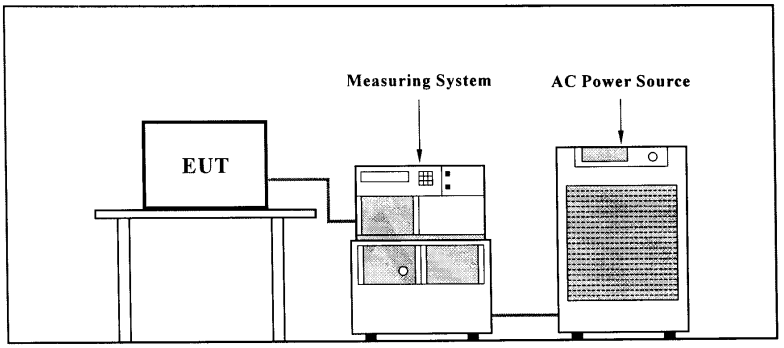
**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.6.2 TEST PROCEDURE

a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under normal operating conditions.

b. During the flick measurement, the measure time shall include that part of whole operation cycle in which the EUT produce the most unfavorable sequence of voltage changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.

## 4.6.3 TEST SETUP




For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

## 4.6.4 EUT OPERATING CONDITIONS

Same as 4.1.6.

## 4.6.5 TEST RESULTS (A)

| EUT | INDUSTRIAL PANEL COMPUTER | MODEL | G3-15AM-00 |
|---|---|---|---|
| MODE | 1 | | |
| INPUT VOLTAGE/AMPERE | 229.631 Vrms / 0.614 Arms | POWER FREQUENCY | 50.000 Hz |
| OBSERVATION PERIOD (Tp) | 2 hours | POWER FACTOR | 0.471 |
| ENVIRONMENTAL CONDITIONS | 20 deg. C, 50 % RH, 1050 hPa | TESTED BY: | Joyce Chen |

| TEST PARAMETER | MEASUREMENT VALUE | LIMIT | REMARKS |
|---|---|---|---|
| $P_{st}$ | 0.091 | 1.0 | Pass |
| $P_{lt}$ | 0.040 | 0.65 | Pass |
| $T_{dt}$ (ms) | 0 | 200 | Pass |
| $d_{max}$ (%) | 0 | 4% | Pass |
| dc (%) | 0 | 3% | Pass |

**NOTE**: (1) $P_{st}$ means short-term flicker indicator.
(2) $P_{lt}$ means long-term flicker indicator.
(3) $T_{dt}$ means maximum time that dt exceeds 3 %.
(4) $d_{max}$ means maximum relative voltage change.
(5) dc means relative steady-state voltage change.

## 4.6.6 TEST RESULTS (B)

| EUT | INDUSTRIAL PANEL COMPUTER | MODEL | G3-12AM-00 |
|---|---|---|---|
| MODE | 2 | | |
| INPUT VOLTAGE/AMPERE | 229.631 Vrms / 0.614 Arms | POWER FREQUENCY | 50.000 Hz |
| OBSERVATION PERIOD (Tp) | 2 hours | POWER FACTOR | 0.510 |
| ENVIRONMENTAL CONDITIONS | 20 deg. C, 50 % RH, 1050 hPa | TESTED BY: | Joyce Chen |

| TEST PARAMETER | MEASUREMENT VALUE | LIMIT | REMARKS |
|---|---|---|---|
| $P_{st}$ | 0.086 | 1.0 | Pass |
| $P_{lt}$ | 0.038 | 0.65 | Pass |
| $T_{dt}$ (ms) | 0 | 200 | Pass |
| $d_{max}$ (%) | 0 | 4% | Pass |
| dc (%) | 0 | 3% | Pass |

**NOTE**: (1) $P_{st}$ means short-term flicker indicator.
(2) $P_{lt}$ means long-term flicker indicator.
(3) $T_{dt}$ means maximum time that dt exceeds 3 %.
(4) $d_{max}$ means maximum relative voltage change.
(5) dc means relative steady-state voltage change.

## 4.6.7 TEST RESULTS (C)

| EUT | INDUSTRIAL PANEL COMPUTER | MODEL | G3-10AR-00 |
|---|---|---|---|
| MODE | 3 | | |
| INPUT VOLTAGE/AMPERE | 229.636 Vrms / 0.515 Arms | POWER FREQUENCY | 50.000 Hz |
| OBSERVATION PERIOD (Tp) | 2 hours | POWER FACTOR | 0.468 |
| ENVIRONMENTAL CONDITIONS | 20 deg. C, 50 % RH, 1050 hPa | TESTED BY: | Joyce Chen |

| TEST PARAMETER | MEASUREMENT VALUE | LIMIT | REMARKS |
|---|---|---|---|
| $P_{st}$ | 0.086 | 1.0 | Pass |
| $P_{lt}$ | 0.038 | 0.65 | Pass |
| $T_{dt}$ (ms) | 0 | 200 | Pass |
| $d_{max}$ (%) | 0 | 4% | Pass |
| dc (%) | 0 | 3% | Pass |

NOTE: (1) $P_{st}$ means short-term flicker indicator.
(2) $P_{lt}$ means long-term flicker indicator.
(3) $T_{dt}$ means maximum time that dt exceeds 3 %.
(4) $d_{max}$ means maximum relative voltage change.
(5) dc means relative steady-state voltage change.

# 5 IMMUNITY TEST

## 5.1 GENERAL DESCRIPTION

| **Product Standard:** | **EN 50082-2: 1995** | |
|---|---|---|
| **Basic Standard, Specification, and Performance Criteria:** | EN 61000-4-2 | Electrostatic Discharge – ESD:<br>8kV air discharge, 4kV Contact discharge,<br>Performance Criterion B |
| | EN 61000-4-3 | Radio-Frequency Electromagnetic Field Susceptibility Test – RS:<br>80-1000 MHz, 10V/m, 80% AM (1kHz),<br>Performance Criterion A |
| | EN 61000-4-4 | Electrical Fast Transient/Burst - EFT,<br>Power line: 2kV, Signal line: 1kV,<br>Performance Criterion B |
| | EN 61000-4-6 | Conducted Radio Frequency Disturbances Test – CS:<br>0.15-80 MHz, 10V, 80% AM, 1kHz,<br>Performance Criterion A |
| | EN 61000-4-8 | Power Frequency Magnetic Field Test,<br>50 Hz, 30A/m,<br>Performance Criterion A |
| | ENV 50204 | Radio-Frequency Electromagnetic Field Test, Pulse modulated, 900+/-5 MHz,10V/m, 50 % duty cycle, Rep. Frequency 200 Hz, Performance Criterion A |

## 5.2 GENERAL PERFORMANCE CRITERIA DESCRIPTION

| | |
|---|---|
| **CRITERION A** | The apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. |
| **CRITERION B** | The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. |
| **CRITERION C** | Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls. |

### 5.2.1 PARTICULAR PERFORMANCE CRITERIA DESCRIPTION FOR DATA PROCESSING FUNCTION OF EUT

| | |
|---|---|
| **CRITERION A** | Failures which do not influence the specified operation within the product specification, and which do not prevent automatic recovery are permissible. |
| **CRITERION B** | Failures which are recovered automatically but cause temporary delay in processing are permissible. |
| **CRITERION C** | Failures resulting in a delay in processing after the external disturbance is removed, but which can be recovered to normal operation by reset or reboot are permissible.<br>Failures resulting in a system abort, which can be recovered to normal operation by reset or reboot are permissible.<br>Failures which are followed by alarms and can be recovered to normal operation by the operator's intervention are permissible. |

## 5.3 EUT OPERATING CONDITION

Same as item 4.1.6.

## 5.4 ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)

### 5.4.1 TEST SPECIFICATION

| | |
|---|---|
| **Basic Standard:** | EN 61000-4-2 |
| **Discharge Impedance:** | 330 ohm / 150 pF |
| **Discharge Voltage:** | Air Discharge - 8 kV (Direct) |
| | Contact Discharge – 4kV (Direct/Indirect) |
| **Polarity:** | Positive / Negative |
| **Number of Discharge:** | Minimum 20 times at each test point |
| **Discharge Mode:** | Single Discharge |
| **Discharge Period:** | 1-second minimum |

### 5.4.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|---|---|---|
| KeyTek, ESD Test System | 2000 | 9105240/41 | Aug. 10, 2001 |
| KeyTek, ESD Simulator | MZ-15/EC | 9902287 | Feb. 26, 2002 |

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

### 5.4.3 TEST PROCEDURE

The discharges shall be applied in two ways:

a. Contact discharges to the conductive surfaces and coupling planes:

The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points. One of the test points shall be subjected to at least 50 indirect discharges to the center of the front edge of the horizontal coupling plane. The remaining three test points shall each receive at least 50 direct contact discharges. If no direct contact test points are available, then at least 200 indirect discharges shall be applied in the indirect mode. Test shall be performed at a maximum repetition rate of one discharge per second.

b. Air discharges at slots and apertures and insulating surfaces:

On those parts of the EUT where it is not possible to perform contact discharge testing, the equipment should be investigated to identify user accessible points where breakdown may occur. Such points are tested using the air discharge method. This investigation should be restricted to those area normally handled by the user. A minimum of 10 single air discharges shall be applied to the selected test point for each such area.

The basic test procedure was in accordance with EN 61000-4-2:

a. Electrostatic discharges were applied only to those points and surfaces of the EUT that are accessible to users during normal operation.

b. The test was performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.

c. The time interval between two successive single discharges was at least 1 second.

d. The ESD generator was held perpendicularly to the surface to which the discharge was applied and the return cable was at least 0.2 meters from the EUT.

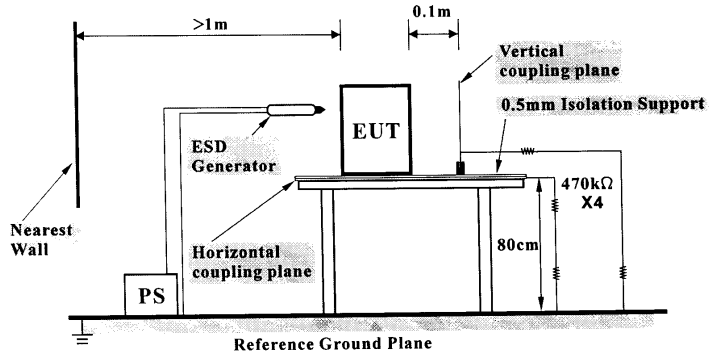
e. Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.

f. Air discharges were applied with the round discharge tip of the discharge electrode approaching the EUT as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator was removed from the EUT and re-triggered for a new single discharge. The test was repeated until all discharges were complete.

g. At least ten single discharges (in the most sensitive polarity) were applied to the **H**orizontal **C**oupling **P**lane at points on each side of the EUT. The ESD generator was positioned vertically at a distance of 0.1 meters from the EUT with the discharge electrode touching the **HCP.**

h. At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the **V**ertical **C**oupling **P**lane in sufficiently different positions that the four faces of the EUT were completely illuminated. The **VCP** (dimensions 0.5m x 0.5m) was placed vertically to and 0.1 meters from the EUT.

## 5.4.4 TEST SETUP




For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

**NOTE:**

TABLE-TOP EQUIPMENT
The configuration consisted of a wooden table 0.8 meters high standing on the **G**round **R**eference **P**lane. The **GRP** consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A **H**orizontal **C**oupling **P**lane (1.6m x 0.8m) was placed on the table and attached to the **GRP** by means of a cable with 940kΩ total impedance. The equipment under test, was installed in a representative system as described in section 7 of EN 61000-4-2:1995, and its cables were placed on the **HCP** and isolated by an insulating support of 0.5mm thickness. A distance of 1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

FLOOR-STANDING EQUIPMENT
The equipment under test was installed in a representative system as described in section 7 of EN 61000-4-2:1995, and its cables were isolated from the Ground Reference Plane by an insulating support of 0.1-meter thickness. The GRP consisted of a sheet of aluminum that is at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system and extended at least 0.5 meters from the EUT on all sides.

## 5.4.5 TEST RESULTS

| | | | |
|---|---|---|---|
| **EUT** | INDUSTRIAL PANEL COMPUTER | **MODEL** | G3-15AM-00, G3-12AM-00, G3-10AR-00 |
| **MODE** | 1, 2 & 3 | **INPUT POWER** | 230Vac, 50 Hz |
| **ENVIRONMENTAL CONDITIONS** | 20 deg. C, 50 % RH, 1050 hPa | **TESTED BY:** | Joyce Chen |

| TEST RESULTS OF DIRECT APPLICATION | | | | | |
|---|---|---|---|---|---|
| Discharge Level (kV) | Polarity (+/-) | Test Point | Contact Discharge | Air Discharge | Performance Criterion |
| 8 | +/- | 1 ~ 10 | NA | Note (1) | A |
| 4 | +/- | 9, 10 | Note (1) | NA | A |

**Description of test point (Please refer to ESD test photo):**

1. Junction of case
2. LED
3. Junction between LCD & case
4. Keys (Mode 1 & 2)
5. Touch Pad (Mode 1 & 2)
6. I/O ports
7. FDD
8. CD-ROM
9. Screws
10. Metal case

| TEST RESULTS OF INDIRECT APPLICATION | | | | | |
|---|---|---|---|---|---|
| Discharge Level (kV) | Polarity (+/-) | Test Point | Horizontal Coupling Plane | Vertical Coupling Plane | Performance Criterion |
| 4 | +/- | 1 ~ 4 | Note (1) | Note (1) | A |

**Description of test point:**

1. Left side
2. Right side
3. Front side
4. Rear side

**NOTE**: (1) There was no change compared with initial operation during the test.

## 5.5 RADIATED, RADIO-FREQUENCY, ELECTROMAGNETIC FIELD IMMUNITY TEST (RS)

### 5.5.1 TEST SPECIFICATION

**Basic Standard:** EN 61000-4-3
**Frequency Range:** 80 MHz - 1000 MHz
**Field Strength:** 10 V/m
**Modulation:** 1kHz Sine Wave, 80%, AM Modulation
**Frequency Step:** 1 % of fundamental
**Polarity of Antenna:** Horizontal and Vertical
**Test Distance:** 3 m
**Antenna Height:** 1.5m
**Dwell Time:** at least 3 seconds

### 5.5.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|---|---|---|
| ROHDE & SCHWARZ Signal Generator | SMY01 | 840490/009 | Aug. 13, 2001 |
| KALMUS Power Amplifier | LA1000V | 091995-1 | NA |
| KALMUS Power Amplifier | 757LC | 091995-2 | NA |
| HOLADAY Field Probe | HI-4422 | 89915 | Aug. 14, 2001 |
| EMCO BiconiLog Antenna | 3141 | 1001 | NA |
| COMTEST Compact Full Anechoic Chamber (7x3x3 m) | CFAC | ADT-S01 | Aug. 26, 2001 |

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

## 5.5.3 TEST PROCEDURE

The test procedure was in accordance with EN 61000-4-3

a. The testing was performed in a fully-anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT.

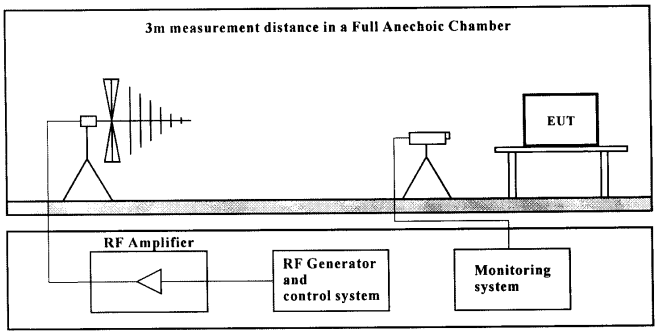
b. The frequency range is swept from 80 MHz to 1000 MHz, with the signal 80% amplitude modulated with a 1kHz sinewave. The rate of sweep did not exceed 1.5 x 10 -3 decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.

c. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.

d. The field strength level was 10V/m.

e. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

## 5.5.4 TEST SETUP




For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

**NOTE:**

TABLETOP EQUIPMENT
The EUT installed in a representative system as described in section 7 of EN 61000-4-3:1996 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

FLOOR STANDING EQUIPMENT
The EUT installed in a representative system as described in section 7 of EN 61000-4-3:1996 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

## 5.5.5 TEST RESULTS

| | | | |
|---|---|---|---|
| **EUT** | INDUSTRIAL PANEL COMPUTER | **MODEL** | G3-15AM-00, G3-12AM-00, G3-10AR-00 |
| **MODE** | 1, 2 & 3 | **INPUT POWER** | 230Vac, 50 Hz |
| **ENVIRONMENTAL CONDITIONS** | 20 deg. C, 50 % RH, 1050 hPa | **TESTED BY:** | Joyce Chen |

| Frequency (MHz) | Result | Polarity | Azimuth | Field Strength (V/m) | Obser-vation | Performance Criterion |
|---|---|---|---|---|---|---|
| 80 -1000 MHz | PASS | V&H | 0 | 10 | Note | A |
| 80 -1000 MHz | PASS | V&H | 90 | 10 | | |
| 80 -1000 MHz | PASS | V&H | 180 | 10 | | |
| 80 -1000 MHz | PASS | V&H | 270 | 10 | | |

**NOTE**: There was no change compared with the initial operation during the test.

## 5.6 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST (EFT)

### 5.6.1 TEST SPECIFICATION

| | |
|---|---|
| **Basic Standard:** | EN 61000-4-4 |
| **Test Voltage:** | Power Line – 2 kV<br>Signal/Control Line – 1kV |
| **Polarity:** | Positive/Negative |
| **Impulse Frequency:** | 5 kHz |
| **Impulse Waveshape :** | 5/50 ns |
| **Burst Duration:** | 15 ms |
| **Burst Period:** | 300 ms |
| **Test Duration:** | Not less than 1 min. |

### 5.6.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|---|---|---|
| KeyTek, EFT Generator | CE-40 | 9508257 | Sept. 4, 2001 |
| KeyTek, Capacitive Clamp | CE-40-CCL | 9508259 | Sept. 4, 2001 |

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

### 5.6.3 TEST PROCEDURE

a. The EUT was tested with 1000 volt discharges to the AC power input leads and 500 volt discharges to the interconnect cables.

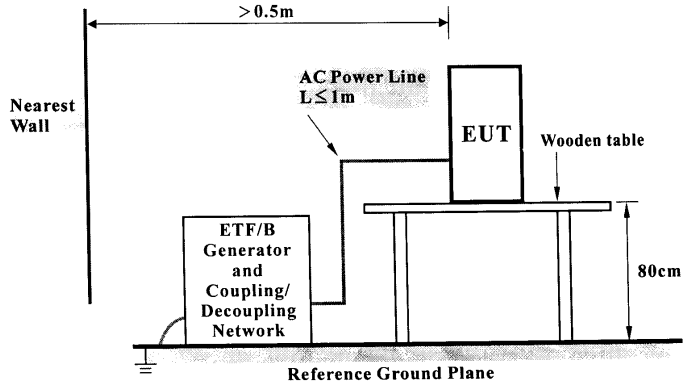
b. Both positive and negative polarity discharges were applied.

c. The length of the "hot wire" from the coaxial output of the EFT generator to the terminals on the EUT should not exceed 1 meter.

d. The duration time of each test sequential was 1 minute.

e. The transient/burst waveform was in accordance with IEC 61000-4-4, 5/50ns.

## 5.6.4 TEST SETUP




For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

**NOTE:**

TABLETOP EQUIPMENT
The configuration consisted of a wooden table (0.8m high) standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system. A minimum distance of 0.5m was provided between the EUT and the walls of the laboratory or any other metallic structure.

FLOOR STANDING EQUIPMENT
The EUT installed in a representative system as described in section 7 of EN 61000-4-4:1995 and its cables, were isolated from the Ground Reference Plane by an insulating support that is 0.1-meter thick. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system.

## 5.6.5 TEST RESULTS

| | | | |
|---|---|---|---|
| **EUT** | INDUSTRIAL PANEL COMPUTER | **MODEL** | G3-15AM-00, G3-12AM-00, G3-10AR-00 |
| **MODE** | 1, 2 & 3 | **INPUT POWER** | 230Vac, 50 Hz |
| **ENVIRONMENTAL CONDITIONS** | 20 deg. C, 65 % RH, 1050 hPa | **TESTED BY:** | Joyce Chen |

| Test Point | Polarity | Test Level (kV) | Observation | Performance Criterion |
|---|---|---|---|---|
| L1 | +/- | 2 | Note(1) | A |
| L2 | +/- | 2 | Note(1) | A |
| GND | +/- | 2 | Note(1) | A |
| Signal/Control Line | +/- | 1 | Note(1) | A |

**NOTE:** There was no change compared with initial operation during the test

## 5.7 IMMUNITY TO CONDUCTED DISTURBANCES INDUCED BY RF FIELDS (CS)

### 5.7.1 TEST SPECIFICATION

**Basic Standard:** EN 61000-4-6
**Frequency Range:** 0.15 MHz - 80 MHz
**Field Strength:** 10 V
**Modulation:** 1kHz Sine Wave, 80%, AM Modulation
**Frequency Step:** 1 % of fundamental
**Coupled Cable:** Power Mains, Unshielded
**Coupling Device:** CDN-M3 (3 wires)/ CLAMP

### 5.7.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|---|---|---|
| ROHDE & SCHWARZ Signal Generator | SMY01 | 840490/009 | Aug. 13, 2001 |
| KALMUS Power Amplifier | LA1000V | 091995-1 | NA |
| KALMUS Power Amplifier | 757LC | 091995-2 | NA |
| FCC Coupling Decoupling Network | FCC-801-M3-25 | 48 | NA |
| FCC Coupling Decoupling Network | FCC-801-M2-25 | 20 | NA |
| FISCHER CUSTOM COMMUNICATIONS EM Injection Clamp | FCC-203I | 50 | NA |
| FCC Coupling Decoupling Network | FCC-801-M1-25 | 17 | NA |
| BOONTON RF Voltage Meter | 9200B | 331801AE | Aug. 13, 2001 |

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

## 5.7.3 TEST PROCEDURE

a. The EUT shall be tested within its intended operating and climatic conditions.

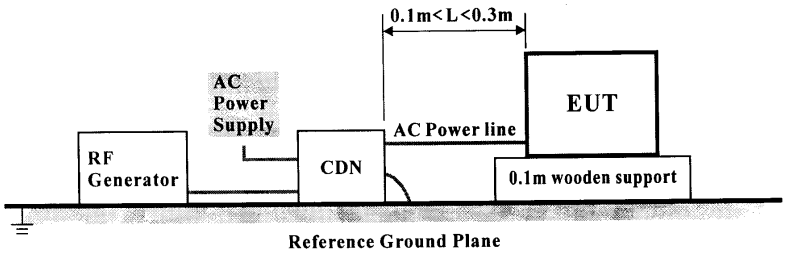
b. The test shall be performed with the test generator connected to each of the coupling and decoupling devices in turn, while the other non-excited RF input ports of the coupling devices are terminated by a 50-ohm load resistor.

c. The frequency range is swept from 150 kHz to 80 MHz, using the signal level established during the setting process and with a disturbance signal of 80 % amplitude. The signal is modulated with a 1 kHz sine wave, pausing to adjust the RF signal level or the switch coupling devices as necessary. The sweep rate shall not exceed 1.5 x $10^{-3}$ decades/s. The step size shall not exceed 1 % of the start and thereafter 1 % of the preceding frequency value where the frequency is swept incrementally.

d. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies such as clock frequency(ies) and harmonics or frequencies of dominant interest, shall be analyzed separately.

e. Attempts should be made to fully exercise the EUT during testing, and to fully interrogate all exercise modes selected for susceptibility.

## 5.7.4 TEST SETUP




For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

**NOTE:**

FLOOR-STANDING EQUIPMENT
The equipment to be tested is placed on an insulating support of 0.1 meters height above a ground reference plane. All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0.1 meters and 0.3 meters from the projected geometry of the EUT on the ground reference plane.

## 5.7.5 TEST RESULTS

| | | | |
|---|---|---|---|
| **EUT** | INDUSTRIAL PANEL COMPUTER | **MODEL** | G3-15AM-00, G3-12AM-00, G3-10AR-00 |
| **MODE** | 1, 2 & 3 | **INPUT POWER** | 230Vac, 50 Hz |
| **ENVIRONMENTAL CONDITIONS** | 24 deg. C, 68 % RH, 1050 hPa | **TESTED BY:** | Joyce Chen |

| FREQUENCY (MHz) | RESULTS | FIELD STRENGTH (V) | OBSERVATION | PERFORMANCE CRITERION |
|---|---|---|---|---|
| 0.15 –80 MHz | PASS | 10 | Note | A |

**NOTE**: There is no change compared with the initial operation during the test.

## 5.8 POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST

### 5.8.1 TEST SPECIFICATION

**Basic Standard:** EN 61000-4-8
**Frequency Range:** 50Hz
**Field Strength:** 30 A/m
**Observation Time:** 1 minute
**Inductance Coil:** Rectangular type, 1mx1m

### 5.8.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|---|---|---|
| HAEFELY Magnetic Field Tester | MAG 100.1 | 083794-06 | NA |
| COMBINOVA Magnetic Field Meter | MFM10 | 224 | Oct. 30, 2001 |

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

### 5.8.3 TEST PROCEDURE

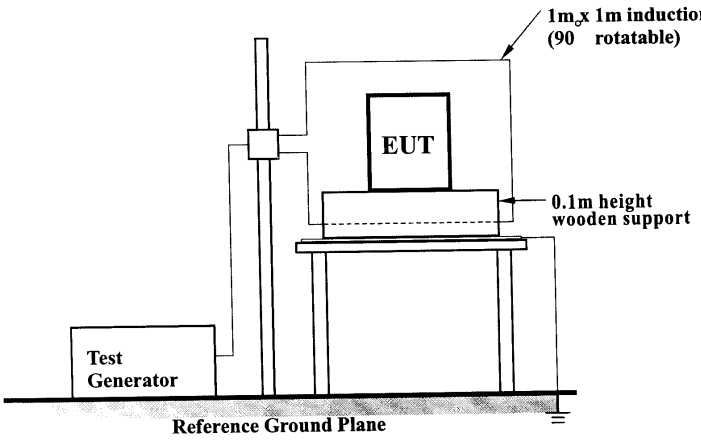
a. The equipment is configured and connected to satisfy its functional requirements. It shall be placed on the GRP with the interposition of a 0.1m-thick insulating support.

b. The equipment cabinets shall be connected to the safety earth directly on the GRP via the earth terminal of the EUT.

c. The power supply, input and output circuits shall be connected to the sources of power supply, control and signal.

d. The cables supplied or recommended by the equipment manufacturer shall be used. 1 meter of all cables used shall be exposed to the magnetic field.

## 5.8.4 TEST SETUP




For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

**NOTE:**

TABLETOP EQUIPMENT
The equipment shall be subjected to the test magnetic field by using the induction coil of standard dimension (1 m x 1 m). The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

FLOOR-STANDING EQUIPMENT
The equipment shall be subjected to the test magnetic field by using induction coils of suitable dimensions. The test shall be repeated by moving and shifting the induction coils, in order to test the whole volume of the EUT for each orthogonal direction. The test shall be repeated with the coil shifted to different positions along the side of the EUT, in steps corresponding to 50 % of the shortest side of the coil. The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

## 5.8.5 TEST RESULTS

| | | | |
|---|---|---|---|
| **EUT** | INDUSTRIAL PANEL COMPUTER | **MODEL** | G3-15AX-00 |
| | | **INPUT POWER** | 230Vac, 50 Hz |
| **ENVIRONMENTAL CONDITIONS** | 20 deg. C, 65 % RH, 1050 hPa | **TESTED BY:** | Joyce Chen |

| DIRECTION | RESULTS | OBSERVATION | PERFORMANCE CRITERION |
|---|---|---|---|
| X | PASS | Note | A |
| Y | PASS | Note | A |
| Z | PASS | Note | A |

**NOTE**: There was no change compared with the initial operation during the test.

## 5.9 RADIATED ELECTROMAGNETIC FIELD FROM DIGITAL RADIO TELEPHONE - IMMUNITY TEST

### 5.9.1 TEST SPECIFICATION

**Basic Standard:** ENV 50204
**Frequency Range:** 900 +/- 5 MHz
**Field Strength:** 10 V/m
**Modulation:** 200Hz, Square Wave, 50% Duty Cycle
**Dwell Time:** 30 second
**Polarity of Antenna:** Horizontal and Vertical
**Test Distance:** 3 m

### 5.9.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|---|---|---|
| ROHDE & SCHWARZ Signal Generator | SMY01 | 840490/009 | Aug. 13, 2001 |
| KALMUS Power Amplifier | LA1000V | 091995-1 | NA |
| KALMUS Power Amplifier | 757LC | 091995-2 | NA |
| HOLADAY Field Probe | HI-4422 | 89915 | Aug. 14, 2001 |
| EMCO BiconiLog Antenna | 3141 | 1001 | NA |
| COMTEST Compact Full Anechoic Chamber (7x3x3 m) | CFAC | ADT-S01 | Aug. 26, 2001 |

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

### 5.9.3 TEST PROCEDURE

The test procedure was in accordance with ENV 50204:

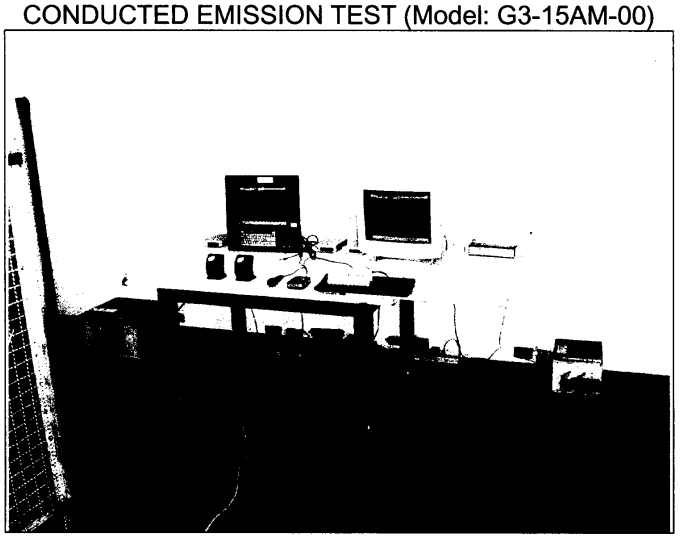
a. The testing was performed in a fully-anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT.

b. The frequency range was from 895 MHz to 905 MHz. The sweep rate did not exceed 30s. The test spot frequencies with keying capability were at 200 Hz, 50 % duty cycle.

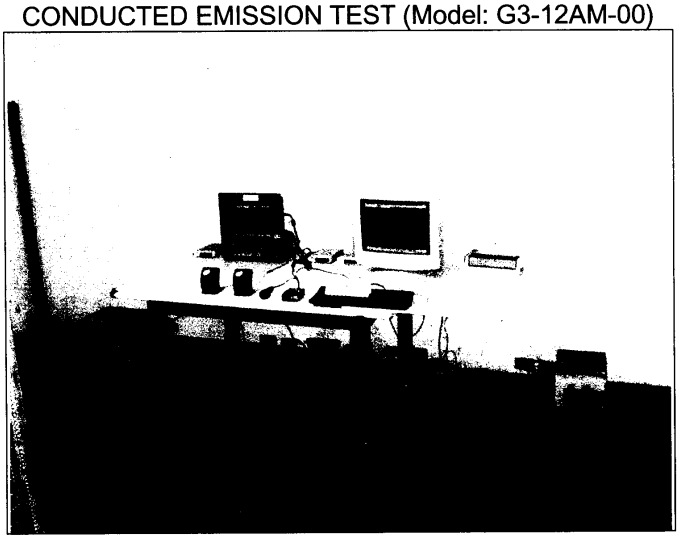
c. The field strength level was 10 V/m.

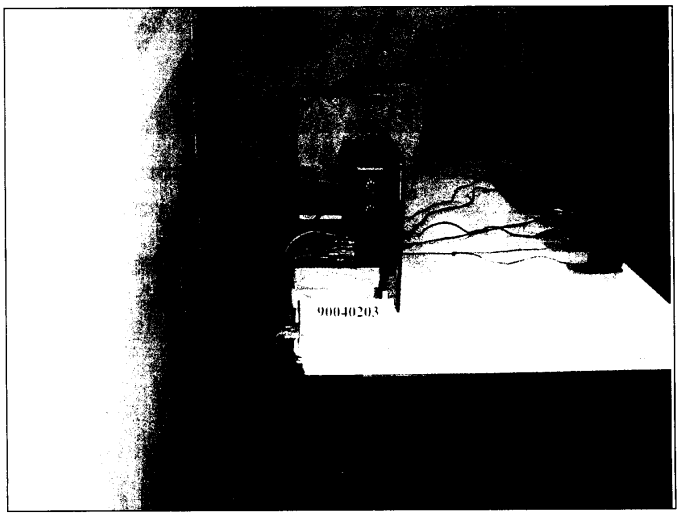
# 6 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST (Model: G3-15AM-00)

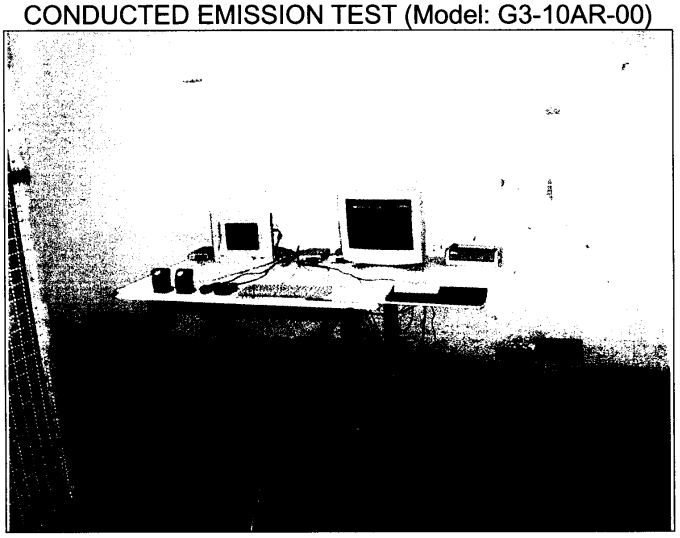


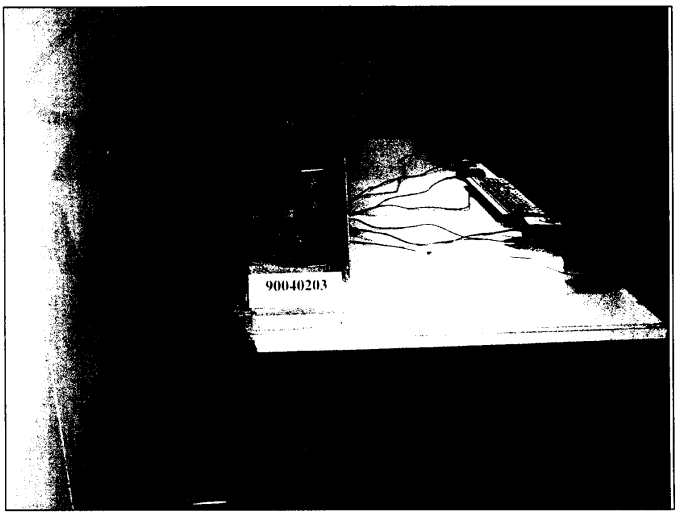
CONDUCTED EMISSION TEST (Model: G3-12AM-00)



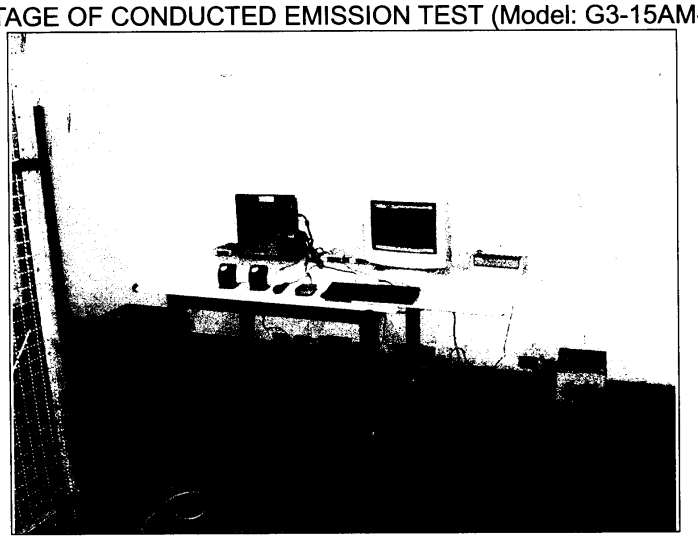


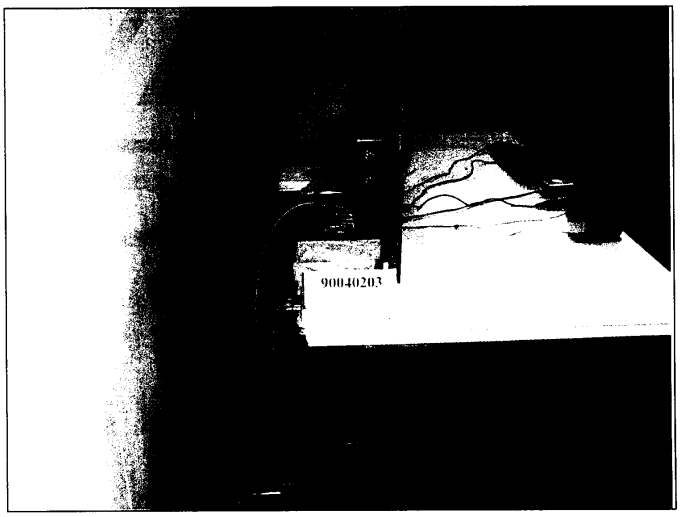
CONDUCTED EMISSION TEST (Model: G3-10AR-00)



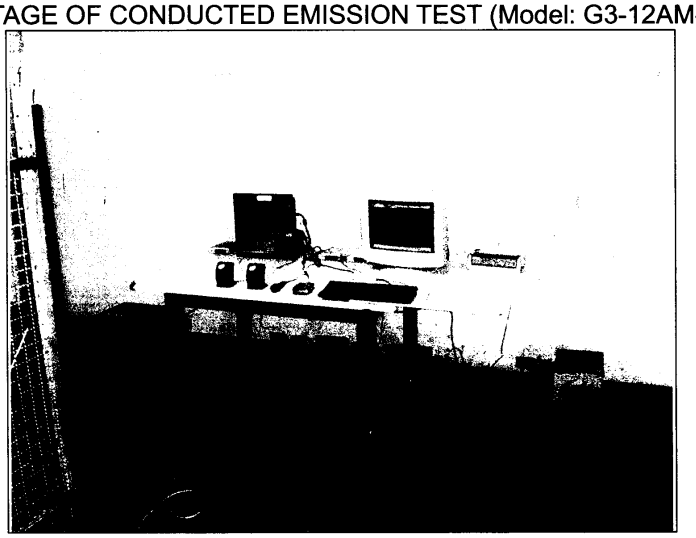


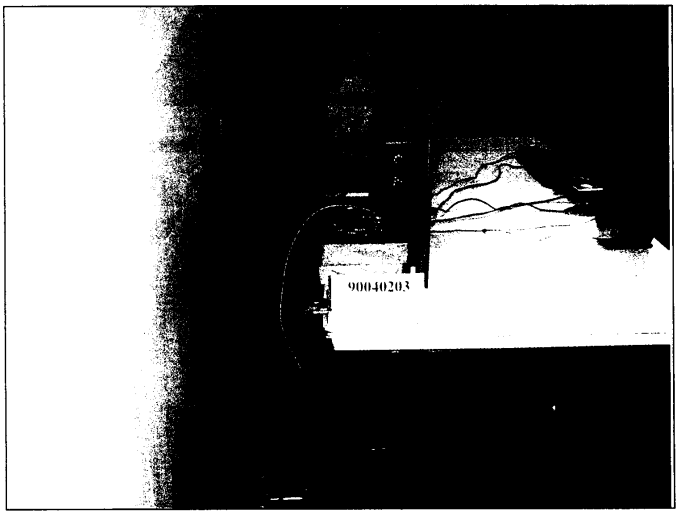
TELECOMMUNICATION PORT – RJ45
VOLTAGE OF CONDUCTED EMISSION TEST (Model: G3-15AM-00)



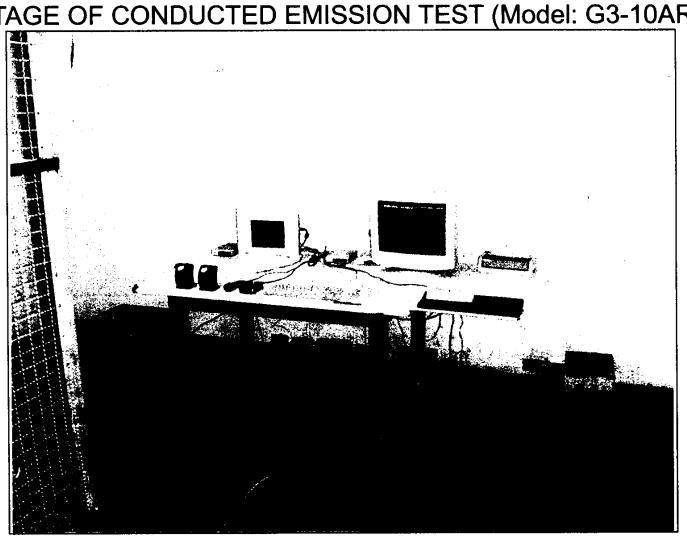


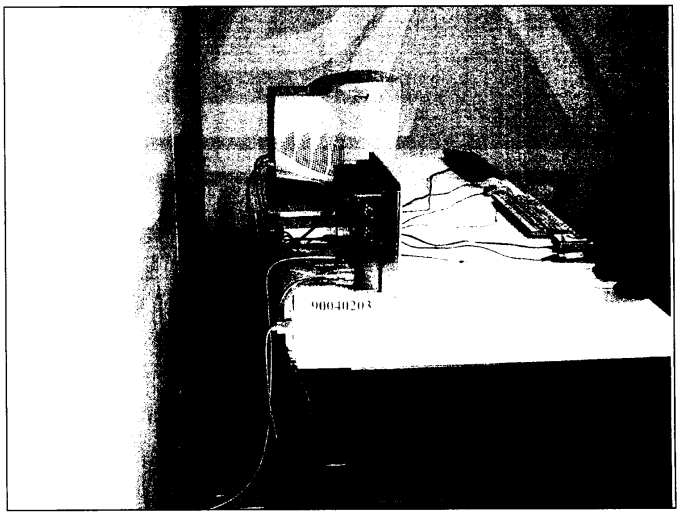
TELECOMMUNICATION PORT – RJ45
VOLTAGE OF CONDUCTED EMISSION TEST (Model: G3-12AM-00)



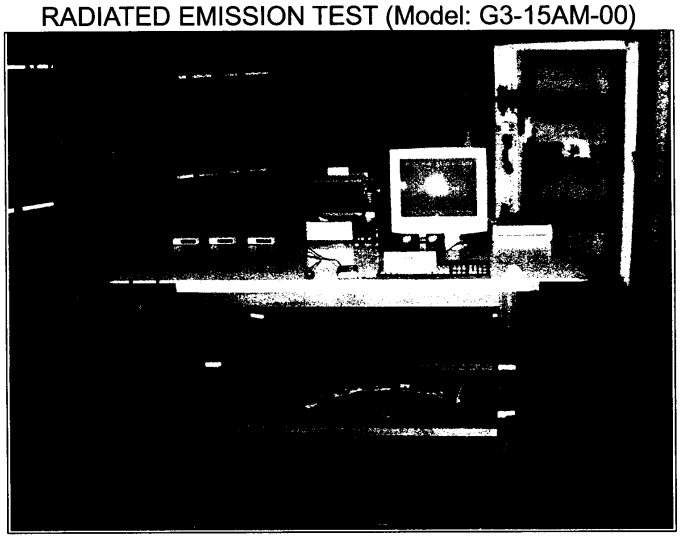


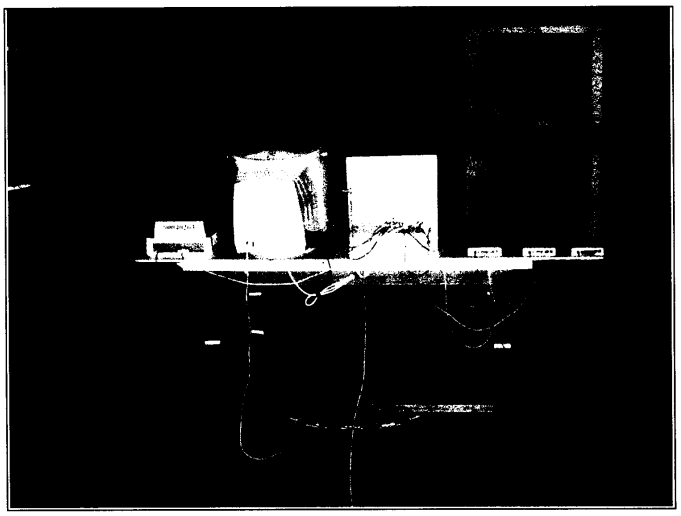
TELECOMMUNICATION PORT – RJ45
VOLTAGE OF CONDUCTED EMISSION TEST (Model: G3-10AR-00)



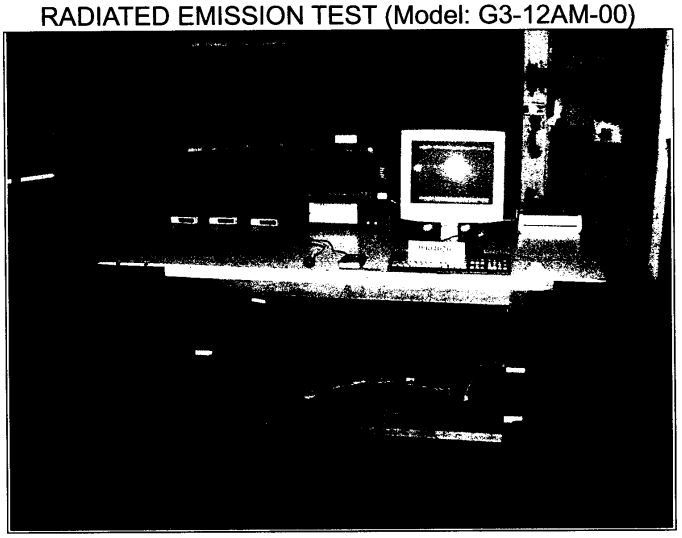


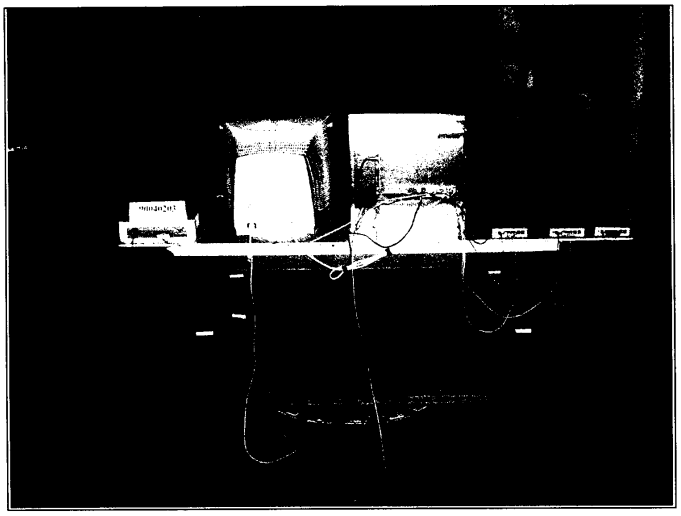
RADIATED EMISSION TEST (Model: G3-15AM-00)



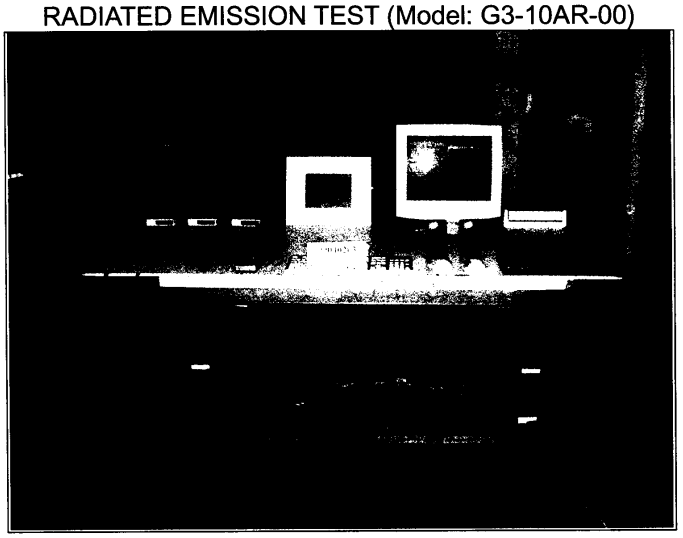


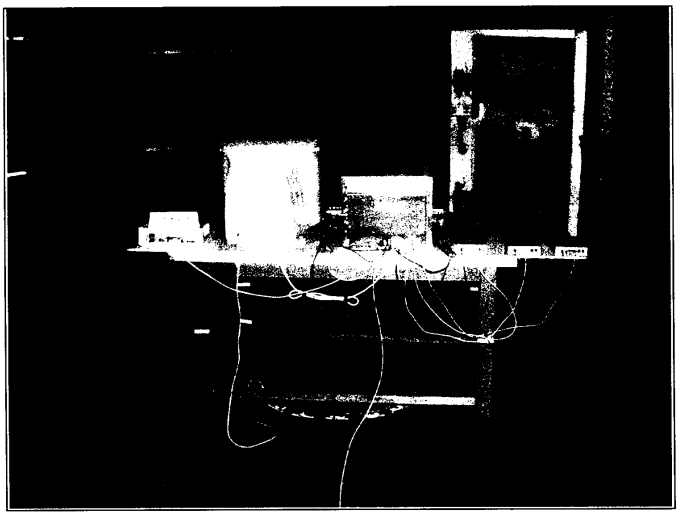
RADIATED EMISSION TEST (Model: G3-12AM-00)



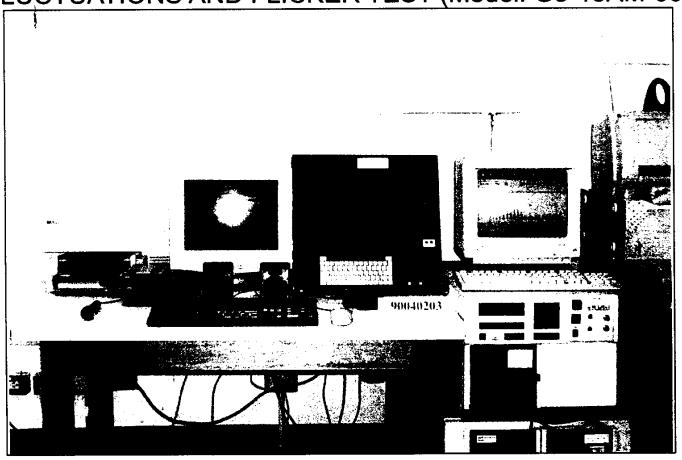


RADIATED EMISSION TEST (Model: G3-10AR-00)

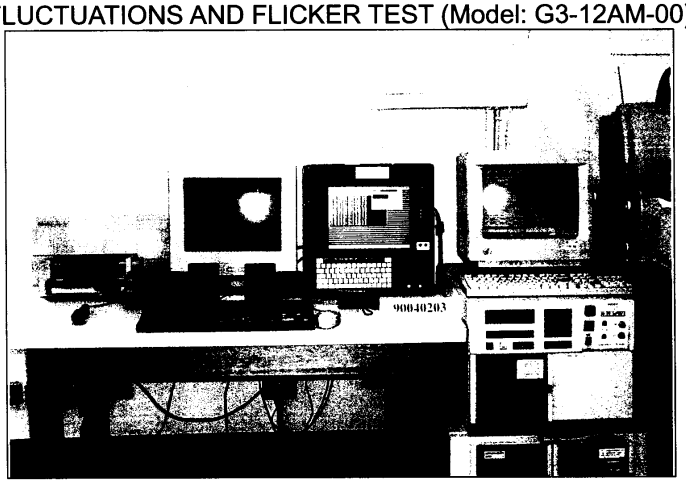




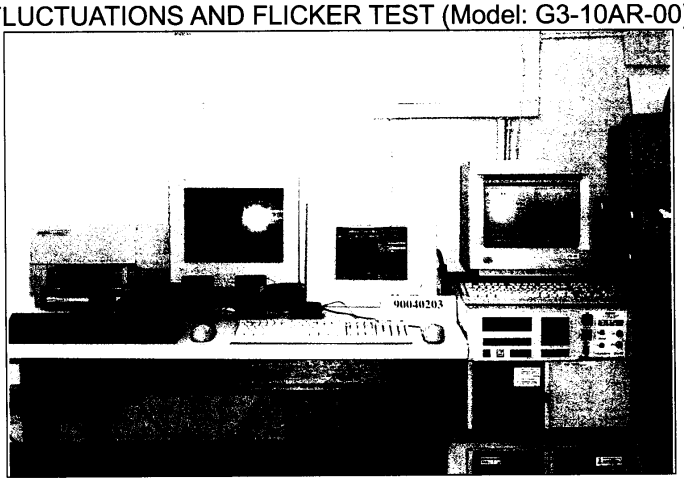
HARMONICS EMISSION TEST & VOLTAGE
FLUCTUATIONS AND FLICKER TEST (Model: G3-15AM-00)



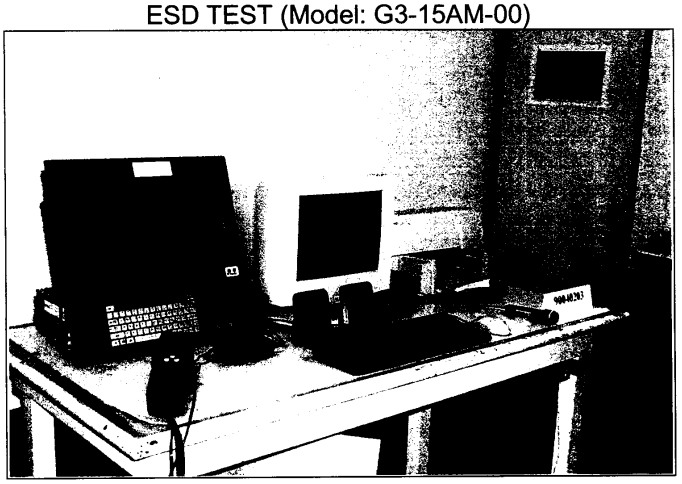

HARMONICS EMISSION TEST & VOLTAGE
FLUCTUATIONS AND FLICKER TEST (Model: G3-12AM-00)

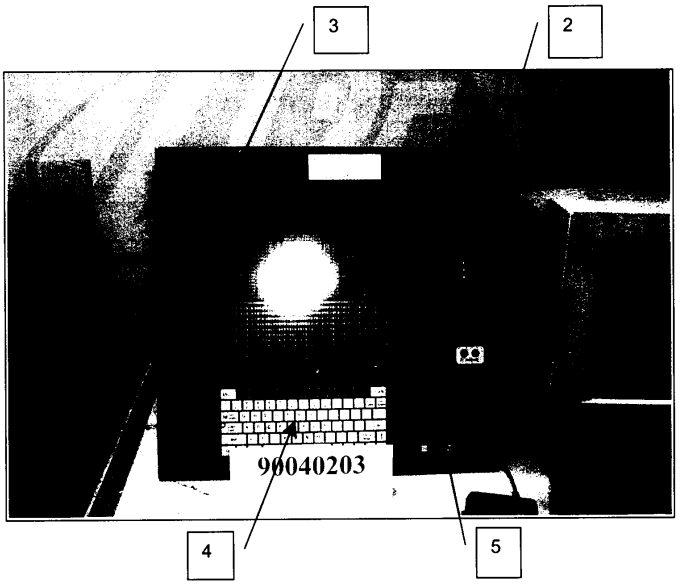


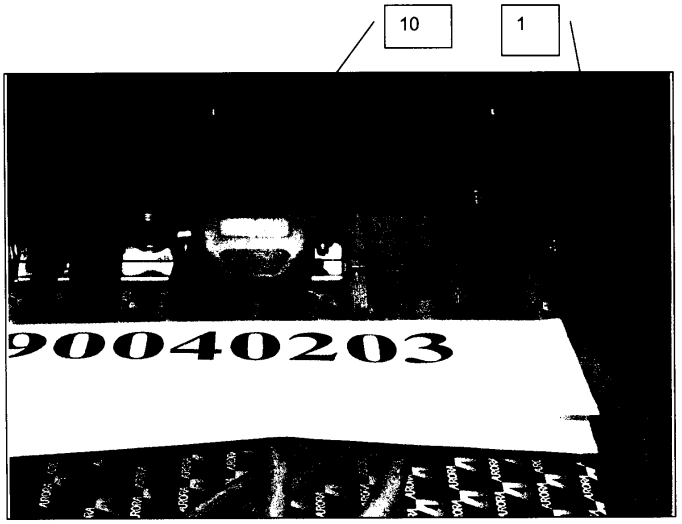
HARMONICS EMISSION TEST & VOLTAGE FLUCTUATIONS AND FLICKER TEST (Model: G3-10AR-00)



ESD TEST (Model: G3-15AM-00)



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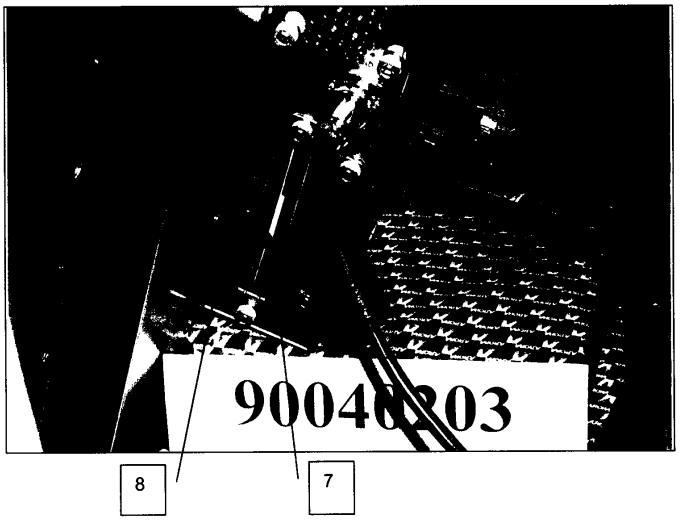
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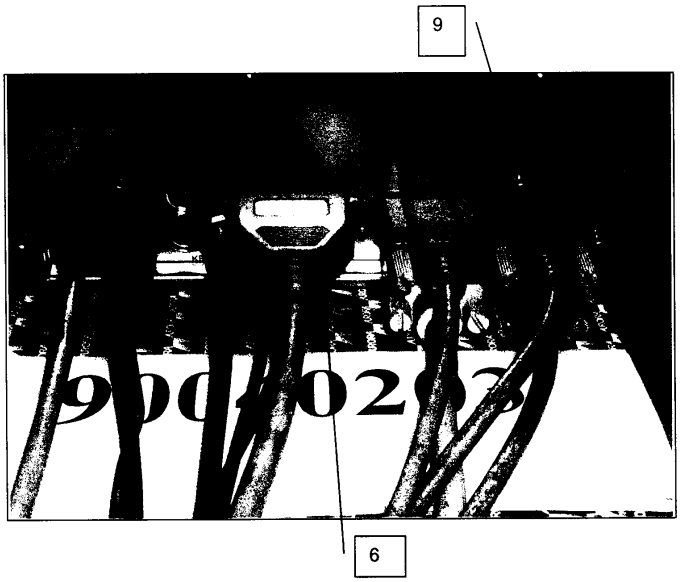
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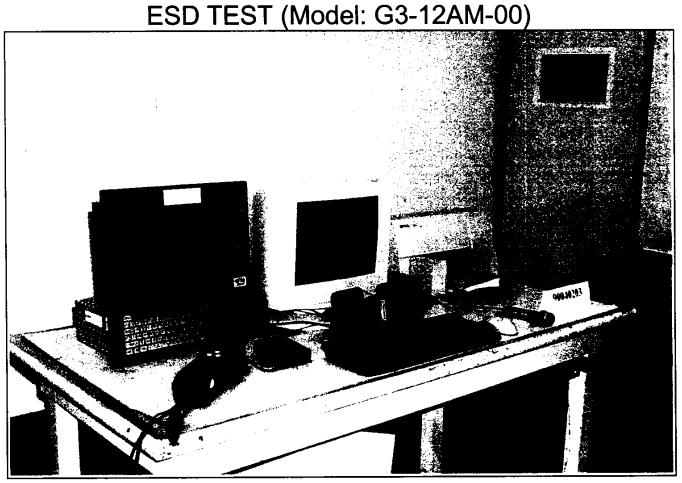
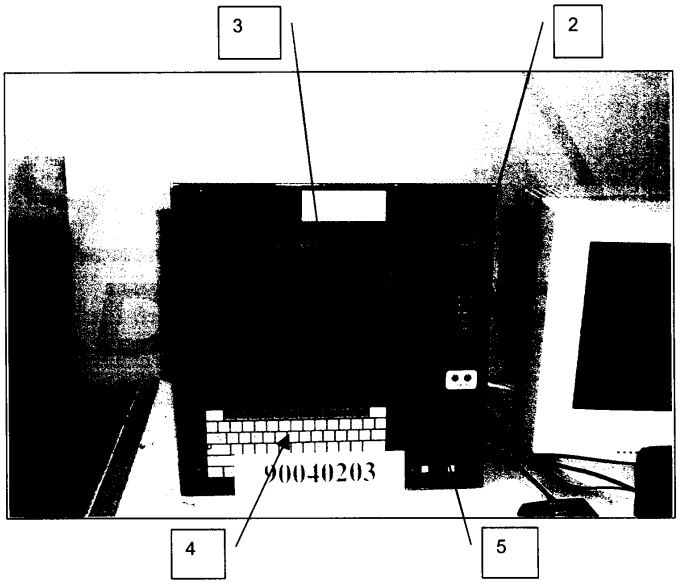
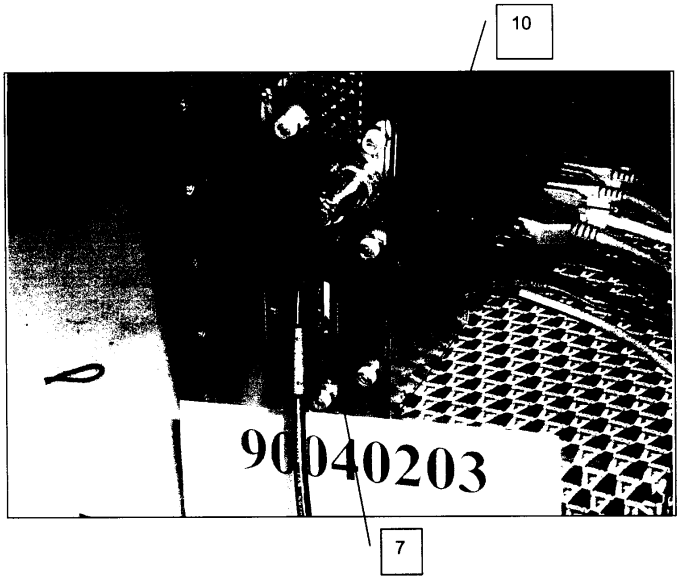
ESD TEST (Model: G3-12AM-00)



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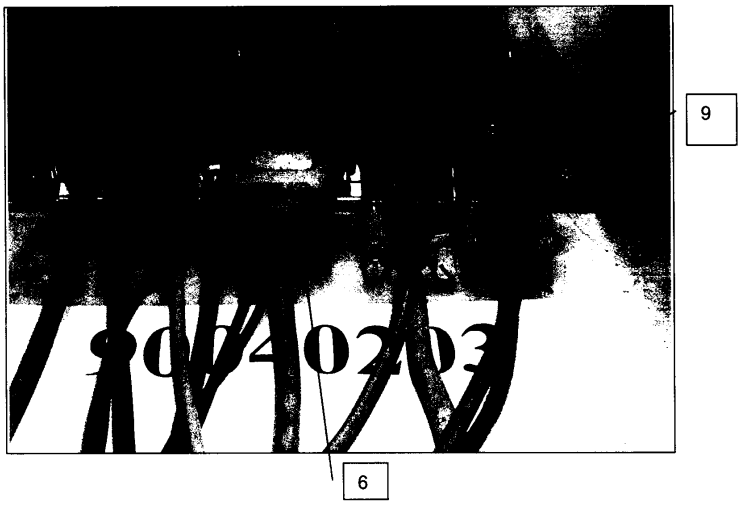
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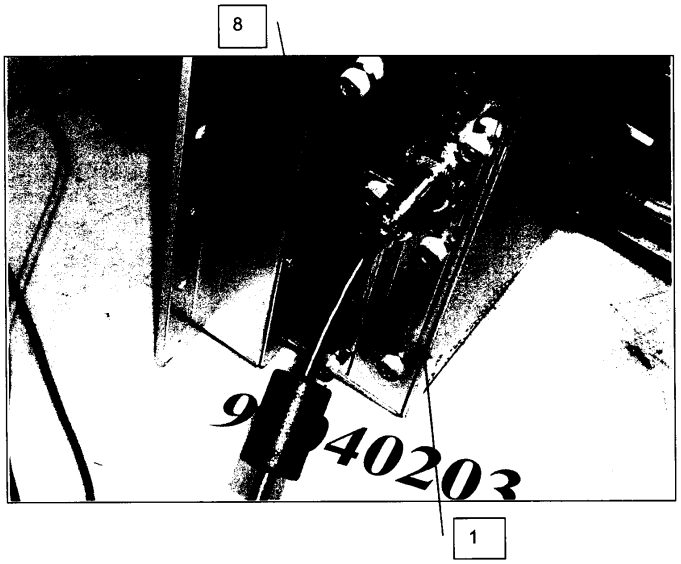
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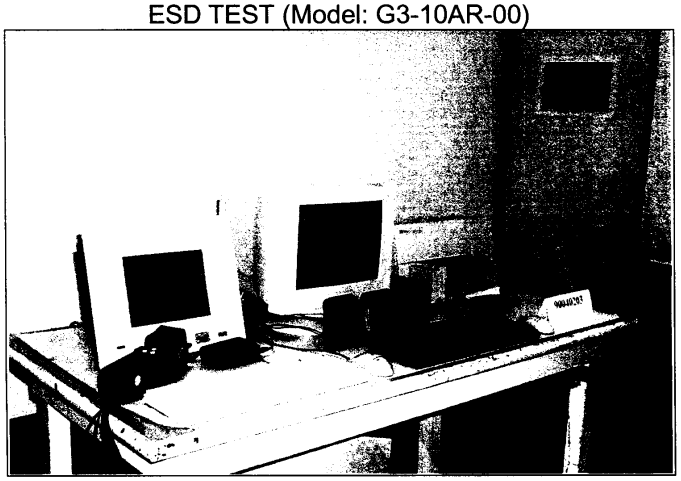
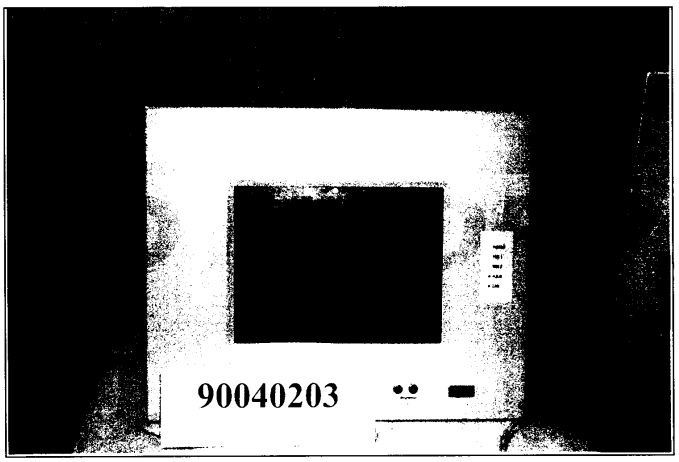
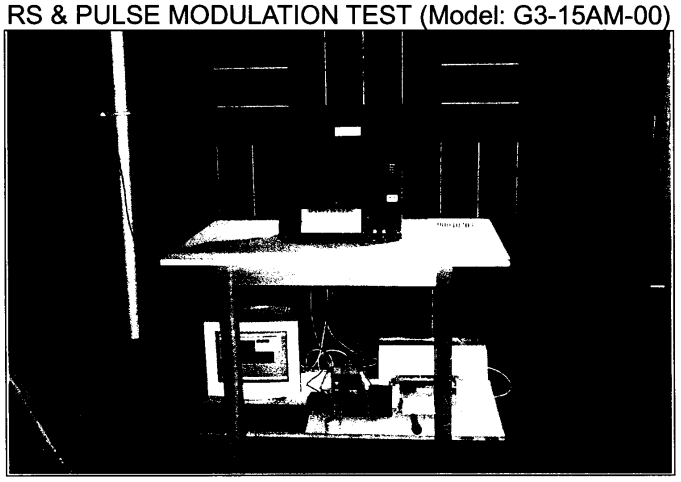
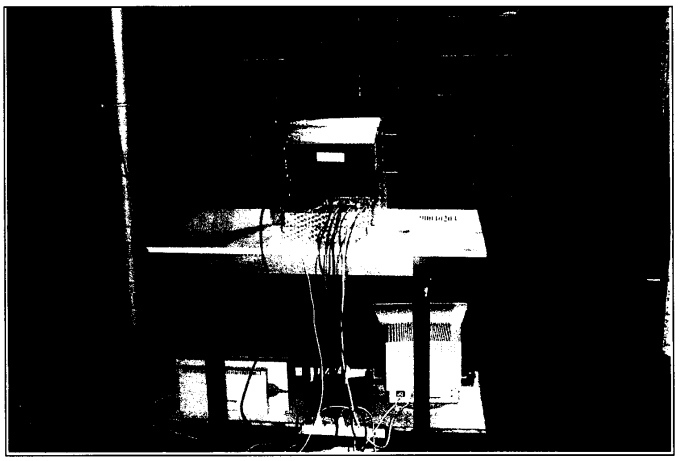
ESD TEST (Model: G3-10AR-00)



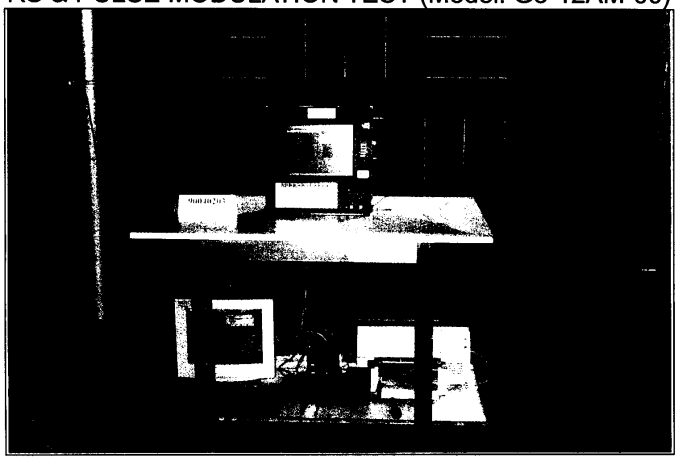


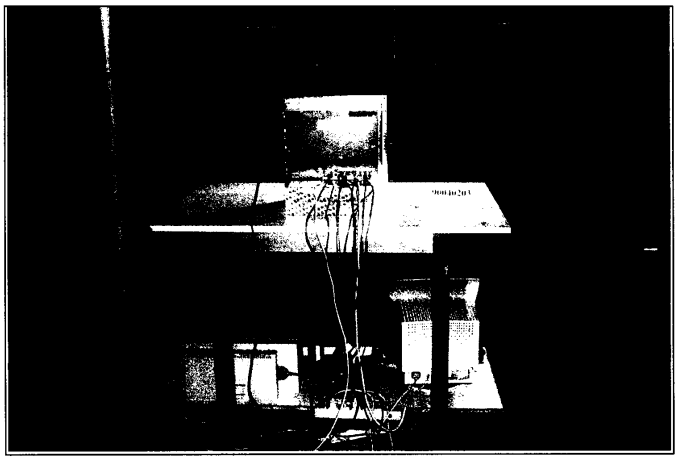
RS & PULSE MODULATION TEST (Model: G3-15AM-00)



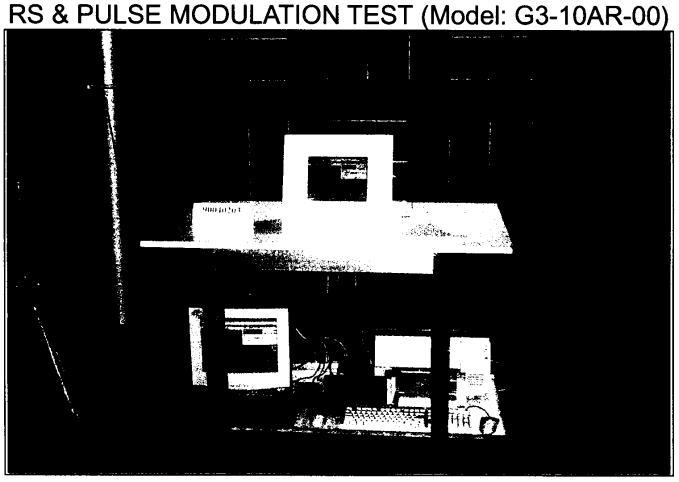


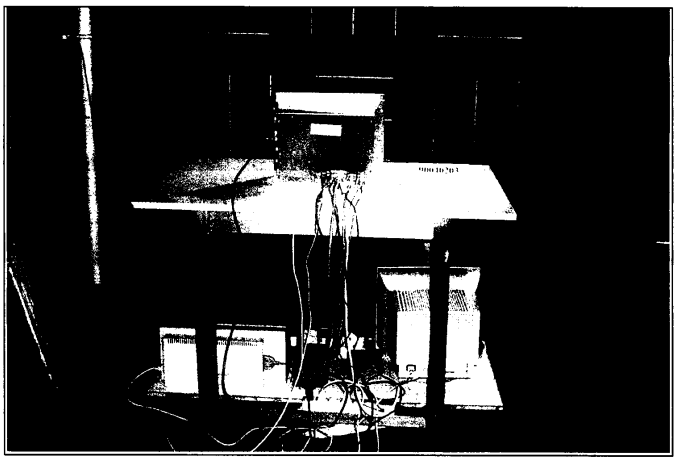
RS & PULSE MODULATION TEST (Model: G3-12AM-00)





RS & PULSE MODULATION TEST (Model: G3-10AR-00)





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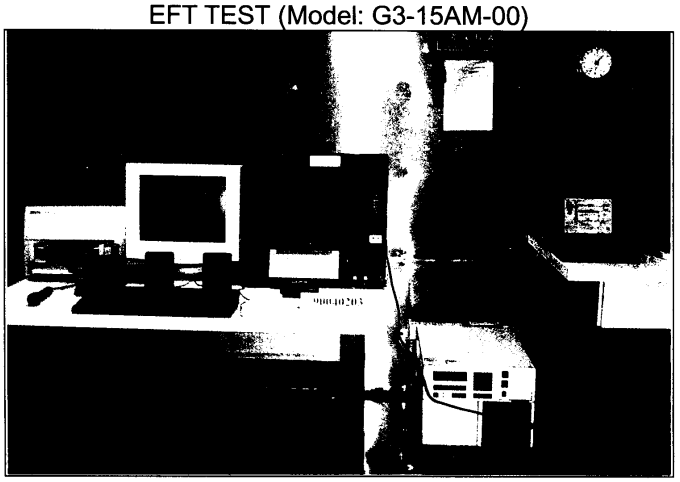

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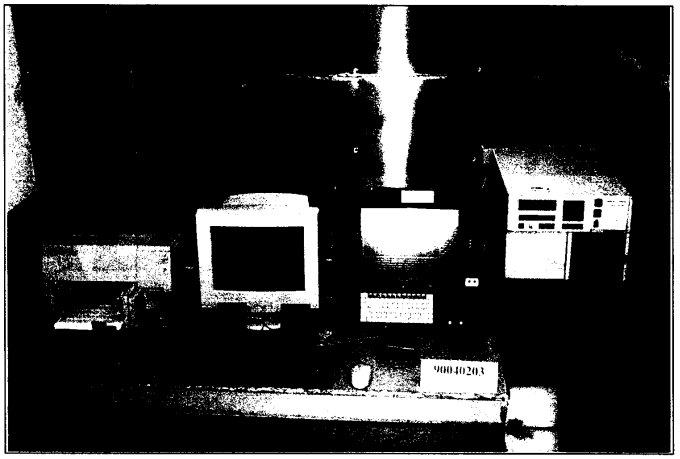

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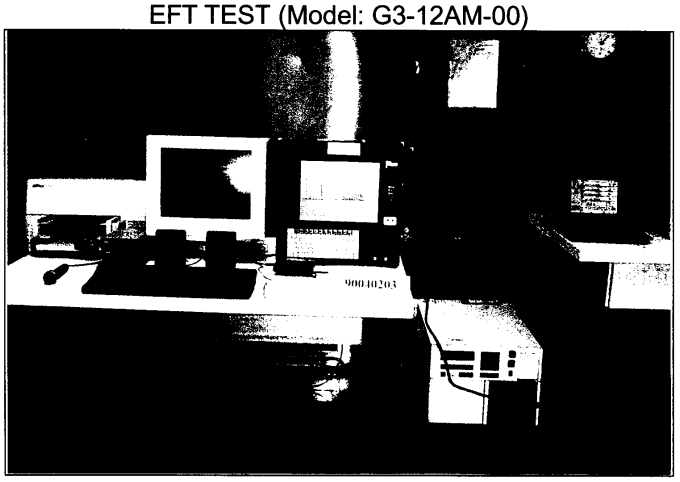

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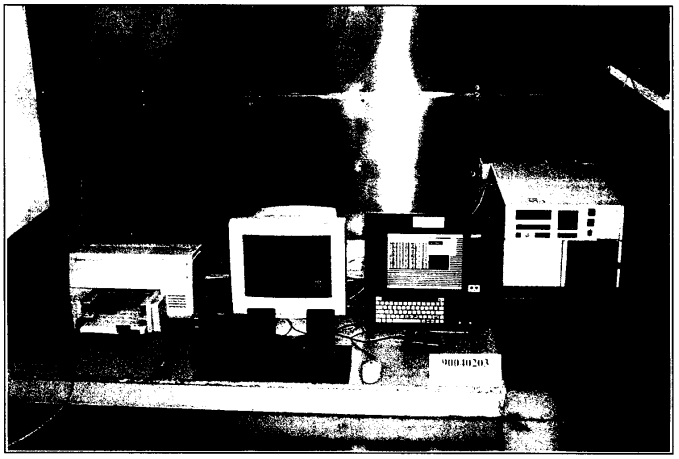

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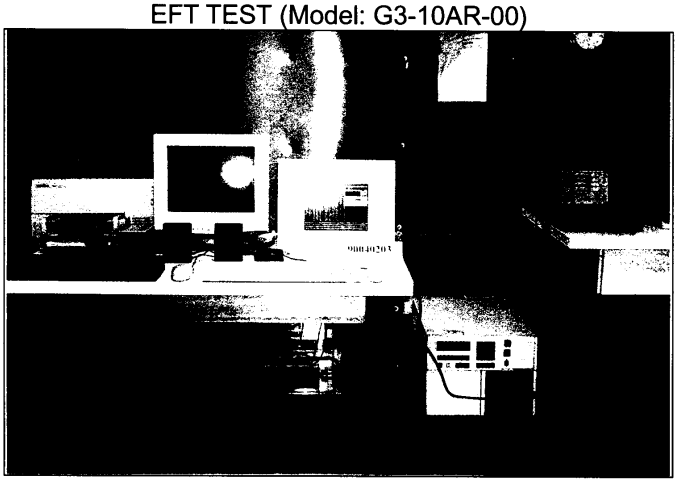

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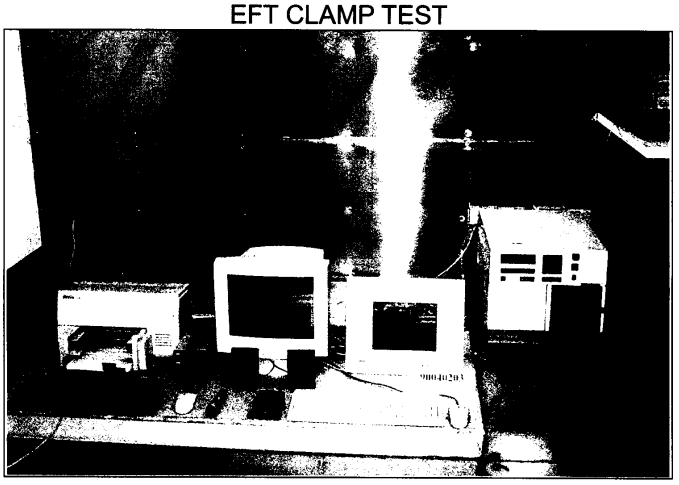

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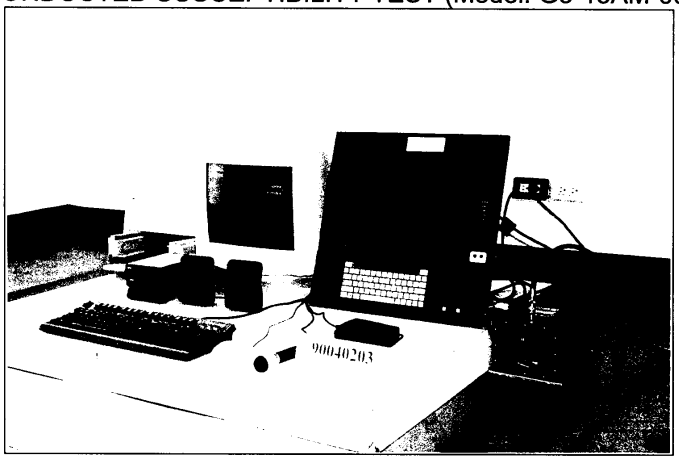


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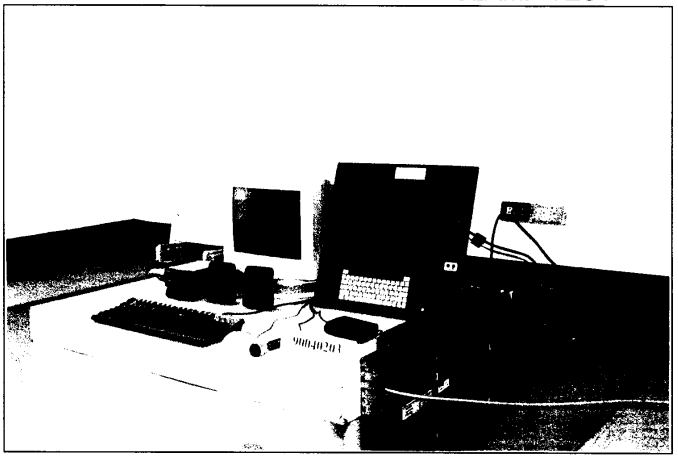

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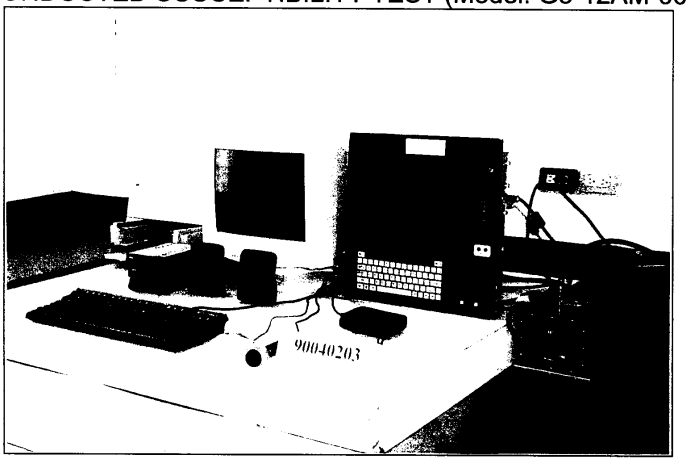


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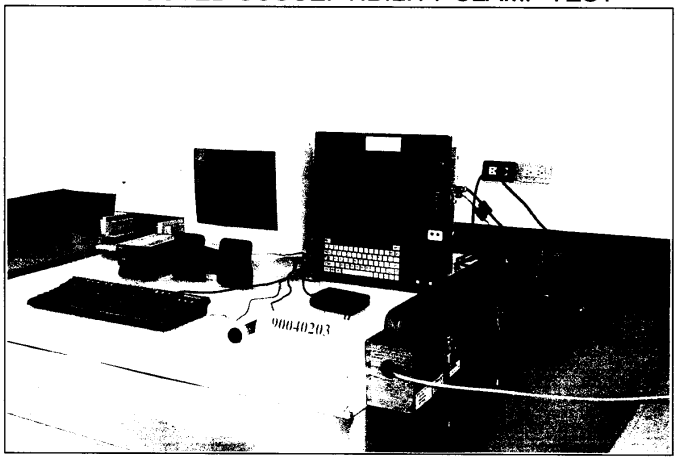

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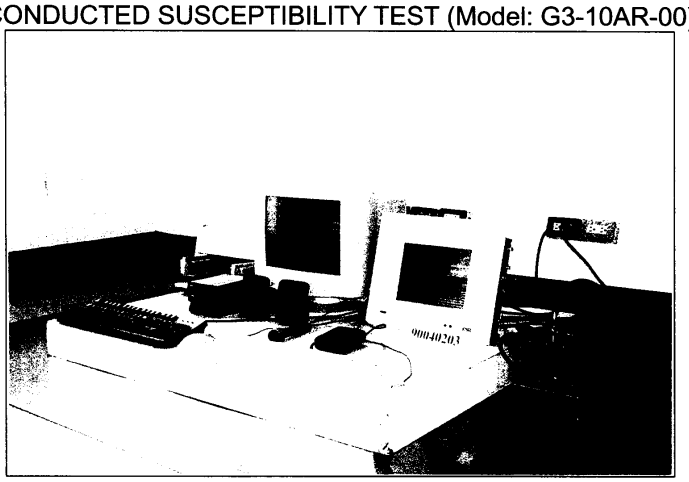

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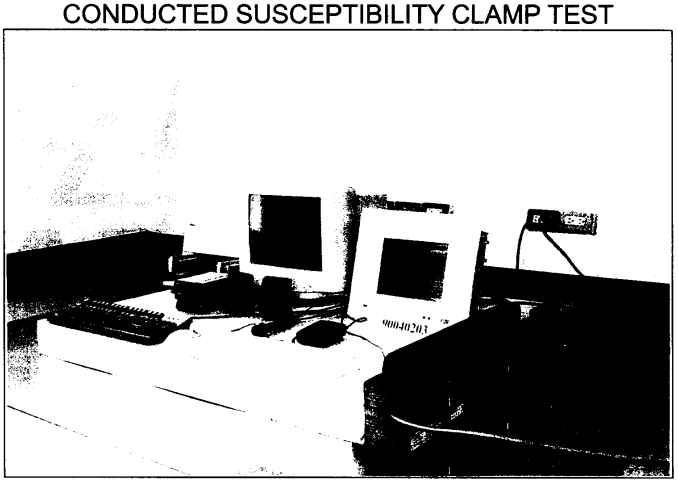

POWER-FREQUENCY MAGNETIC FIELDS TEST
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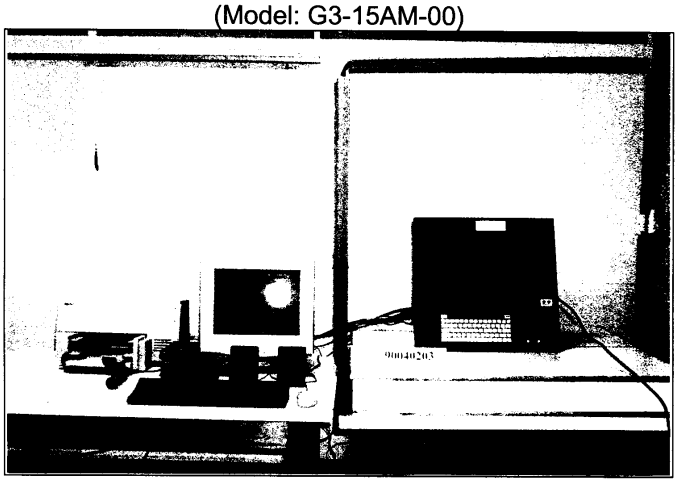


POWER-FREQUENCY MAGNETIC FIELDS TEST
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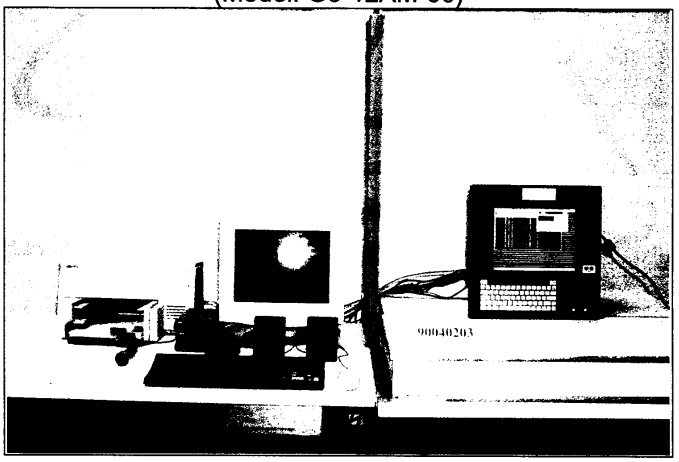

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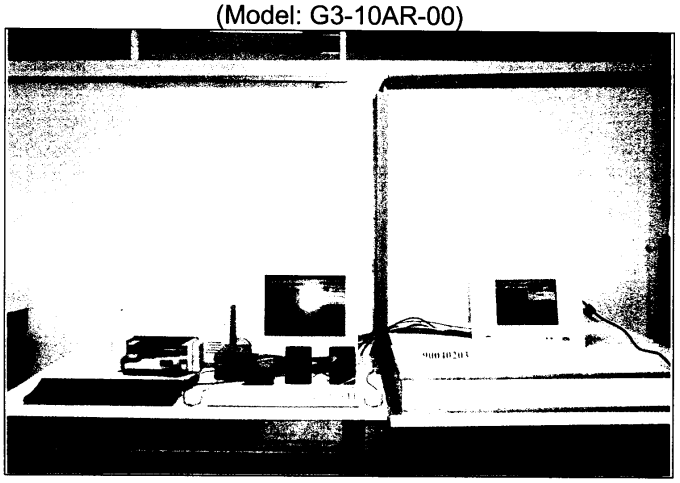


# 7 APPENDIX - INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025, Guide 25 or EN 45001:

| | |
|---|---|
| **USA** | FCC, NVLAP |
| **Germany** | TUV Rheinland |
| **Japan** | VCCI |
| **New Zealand** | MoC |
| **Norway** | NEMKO, DNV |
| **U.K.** | INCHCAPE |
| **R.O.C.** | BSMI |

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml.

If you have any comments, please feel free to contact us at the following:


**Lin Kou EMC Lab**:
Tel: 886-2-26052180
Fax: 886-2-26052943

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

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

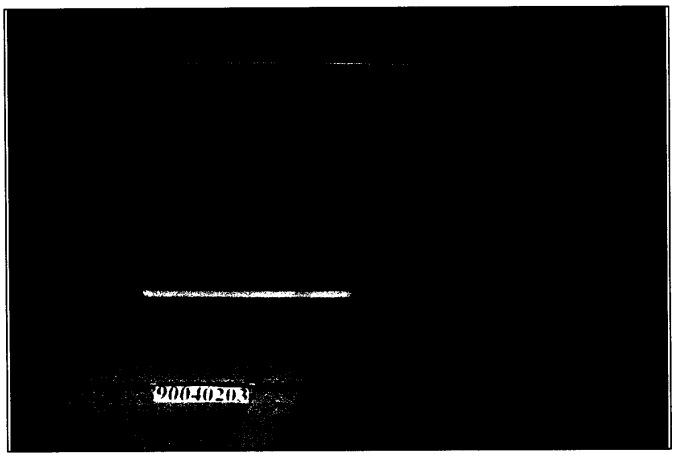
**Design Center**:
Tel: 886-2-26093195
Fax: 886-2-26093184

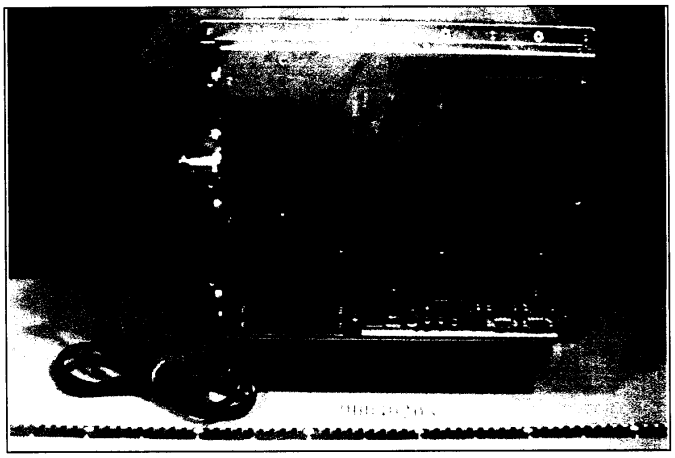
**Email**: service@mail.adt.com.tw
**Web Site**: www.adt.com.tw


The address and road map of all our labs can be found in our web site also.

# CONSTRUCTION PHOTOS OF EUT

**MODEL: G3-10AX-00**



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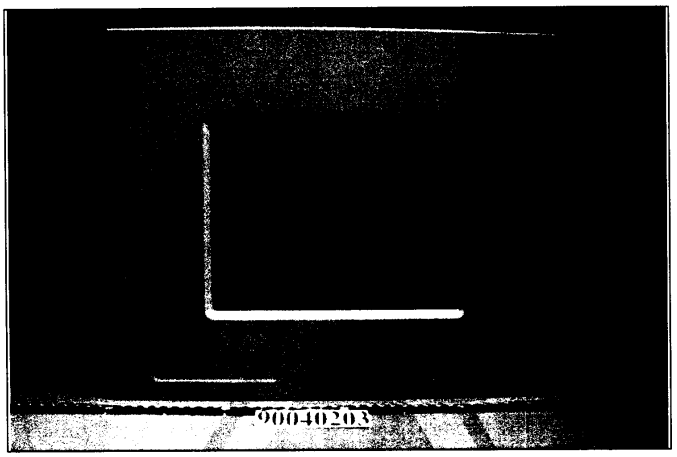


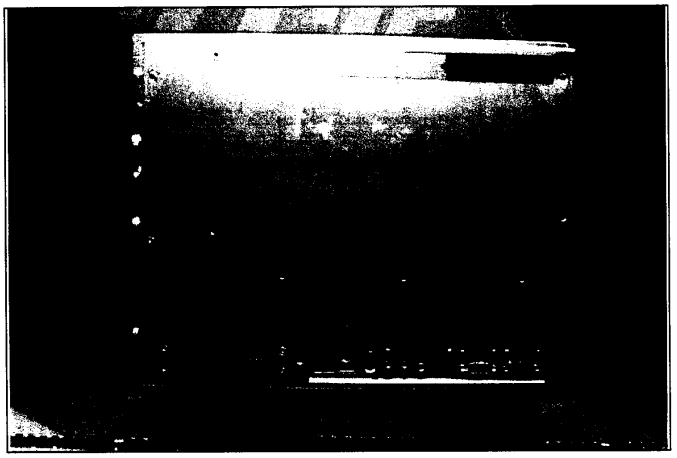

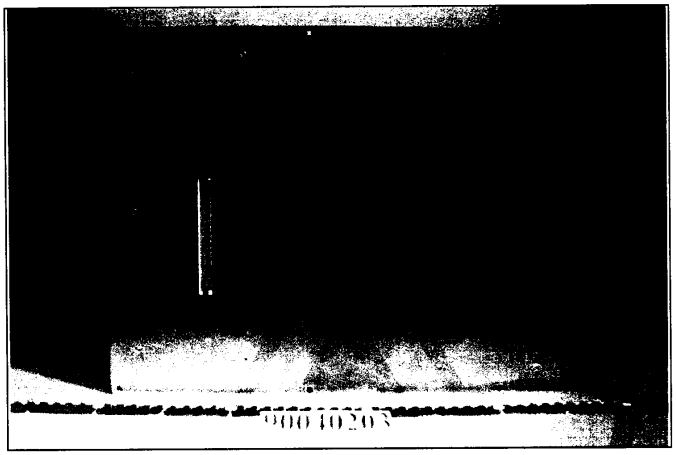

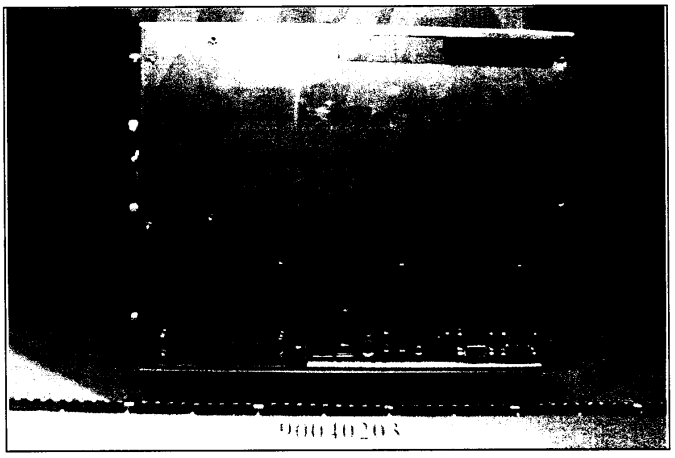

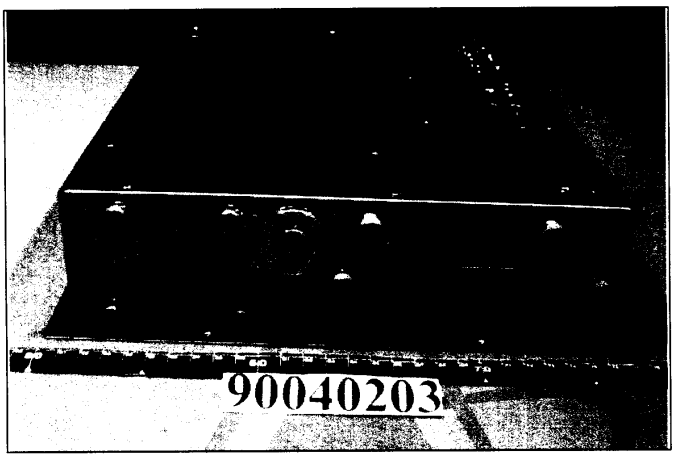
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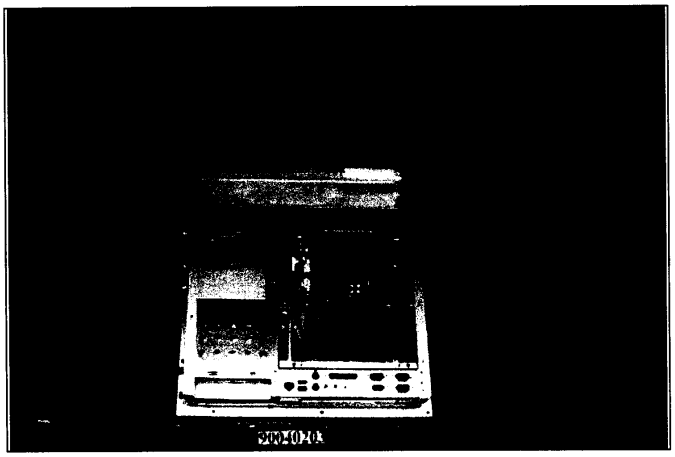

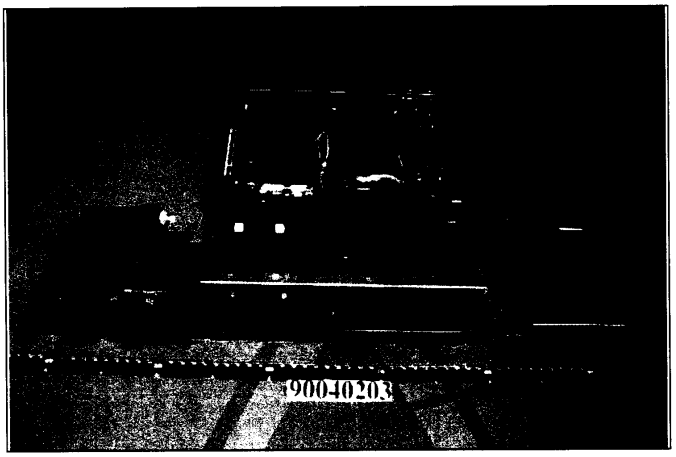
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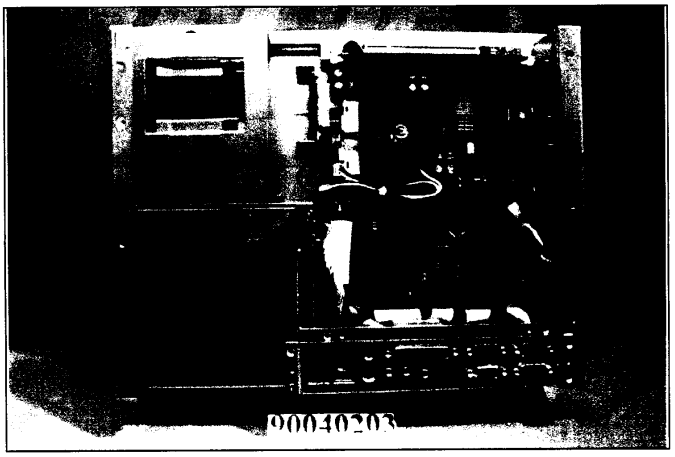
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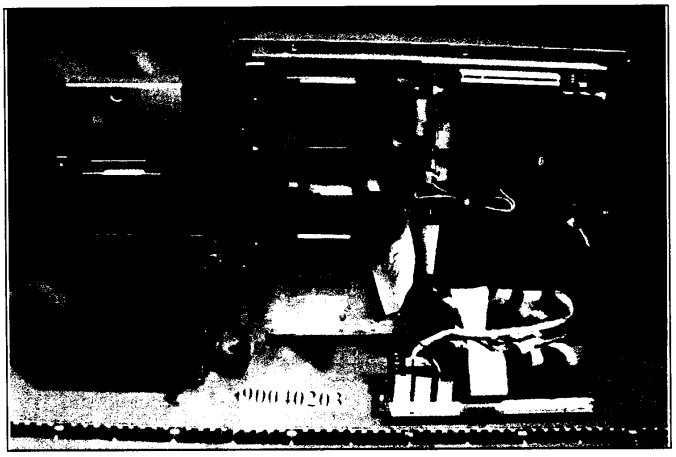


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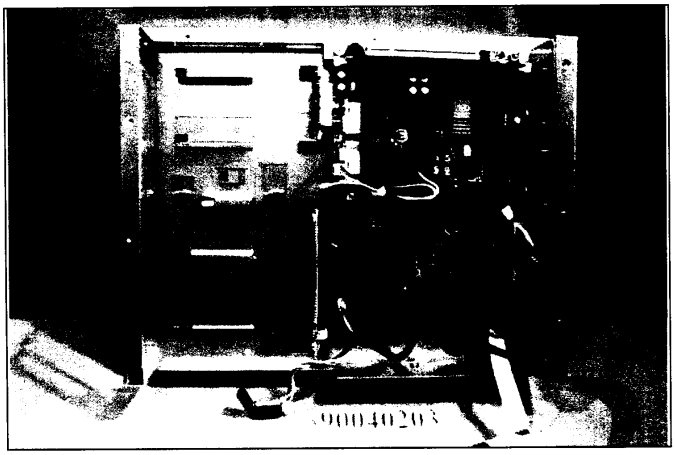


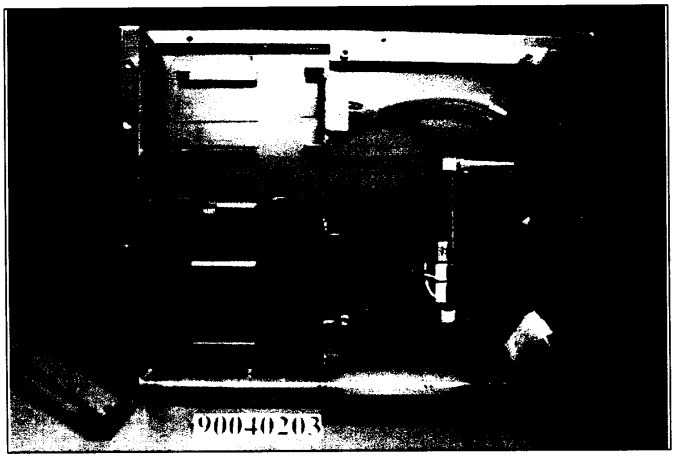

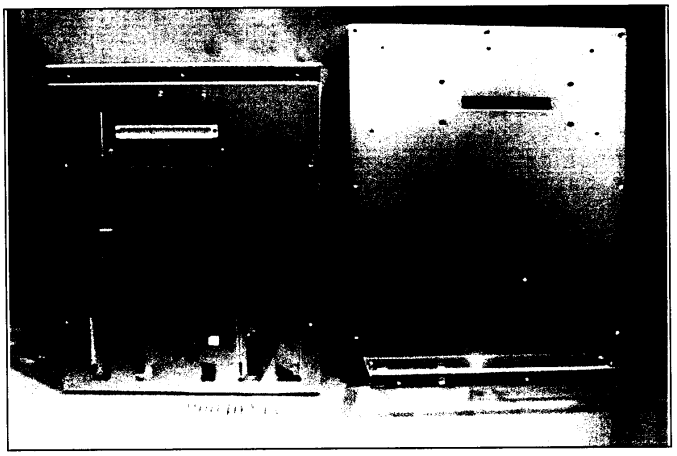

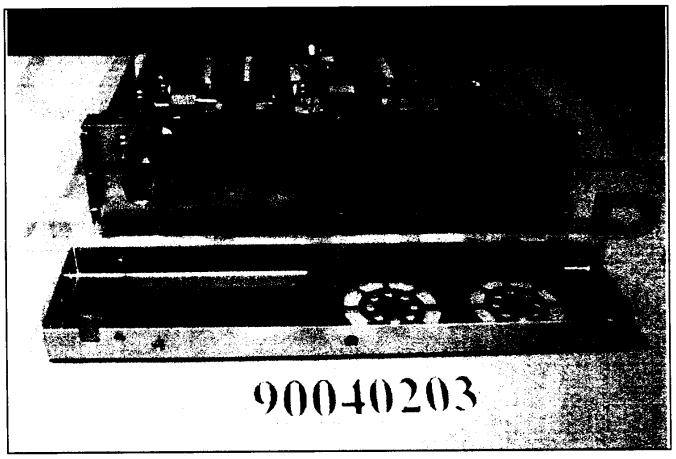
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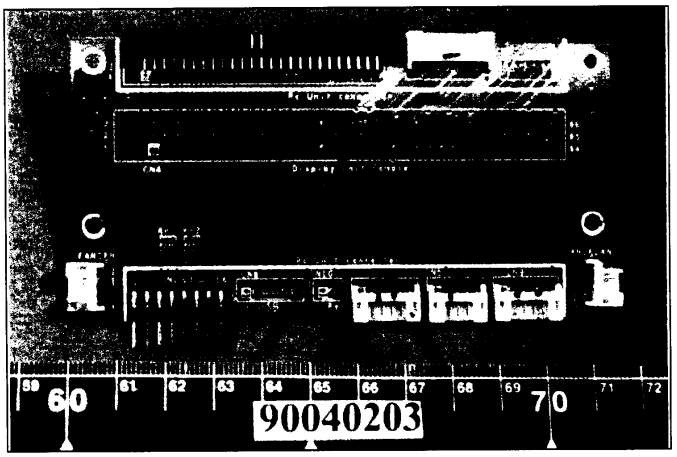
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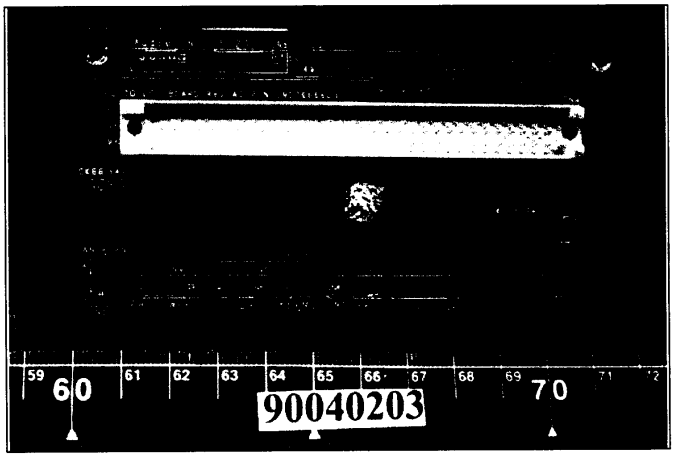
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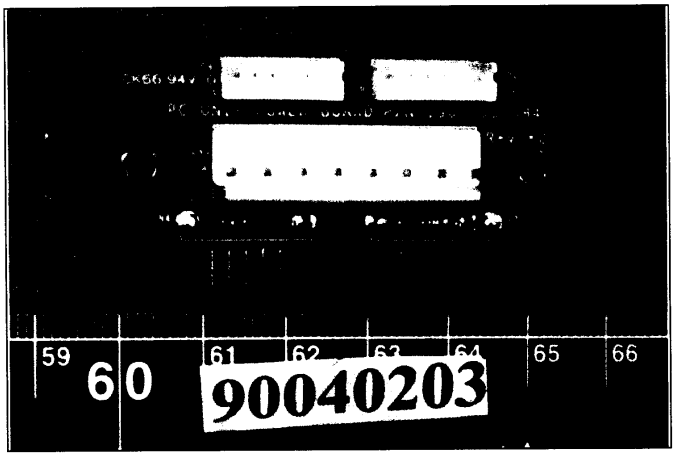
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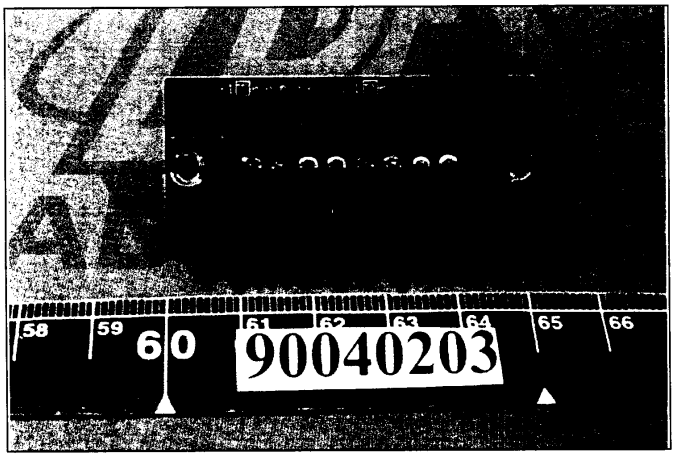
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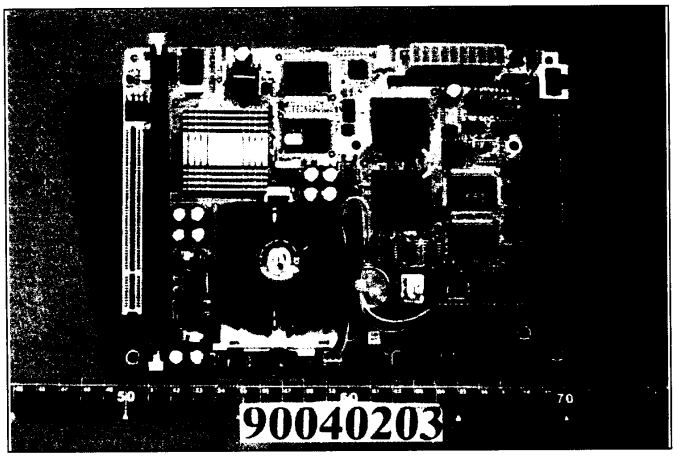
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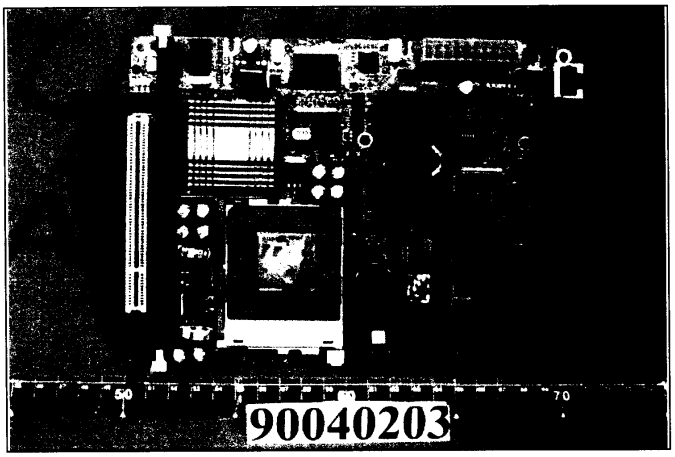
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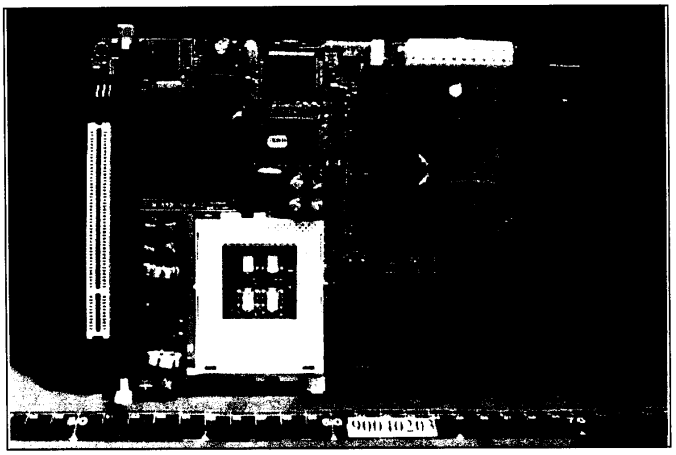

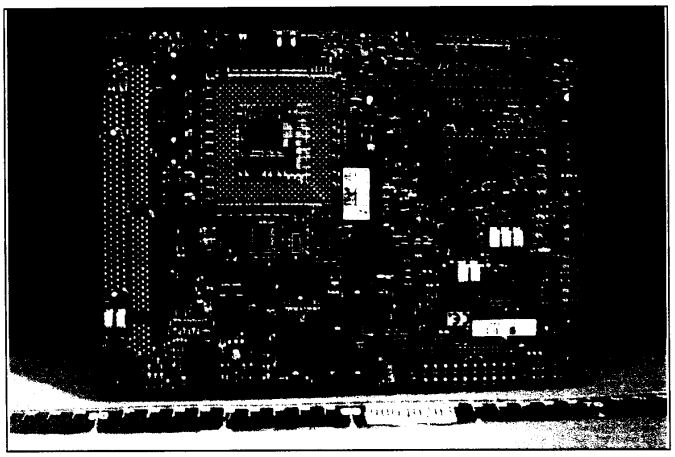

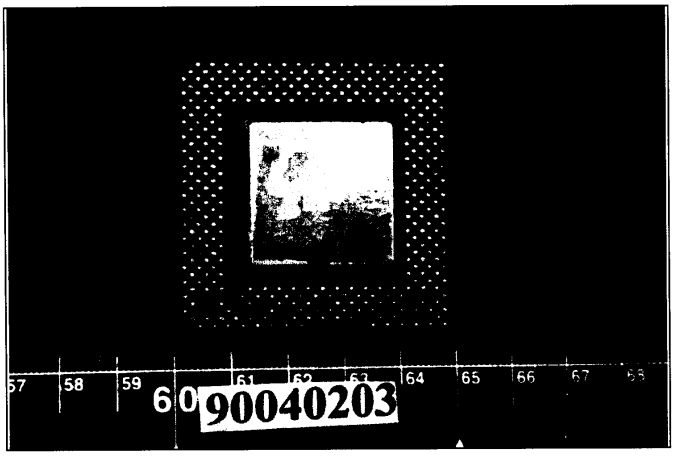
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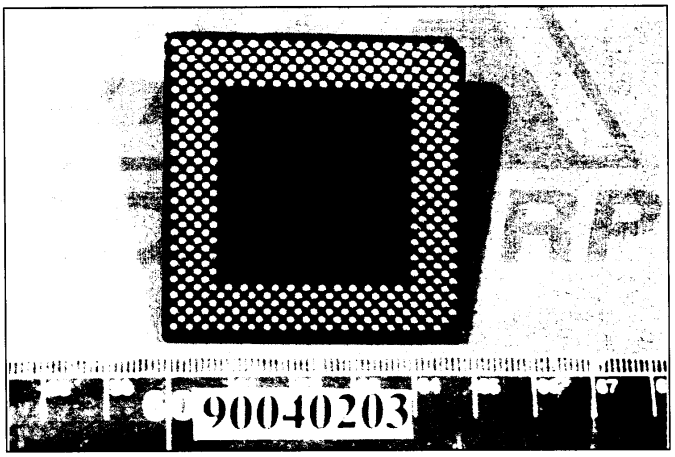
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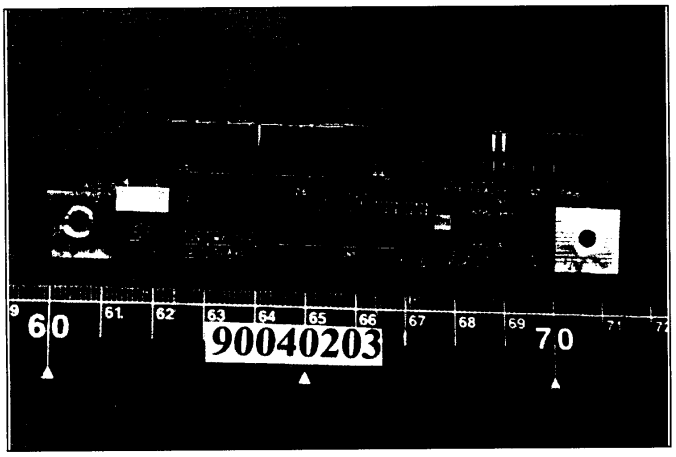
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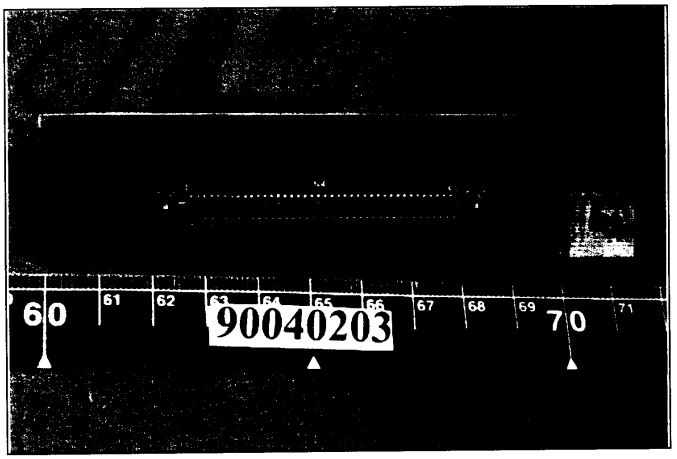
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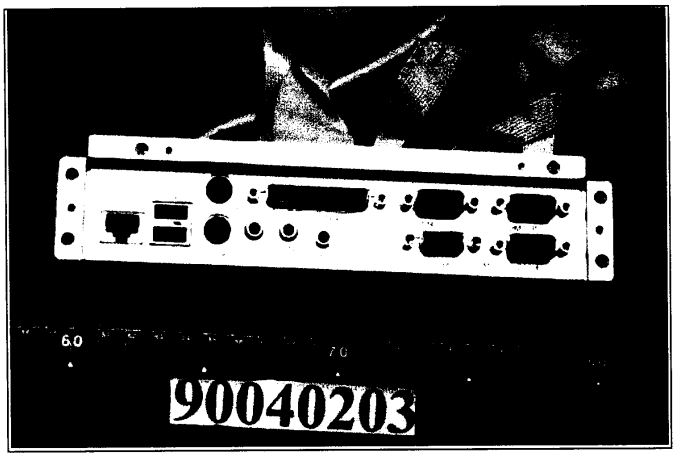
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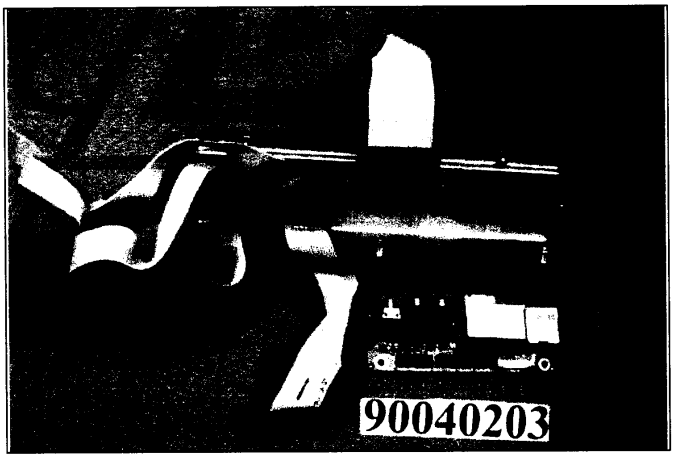
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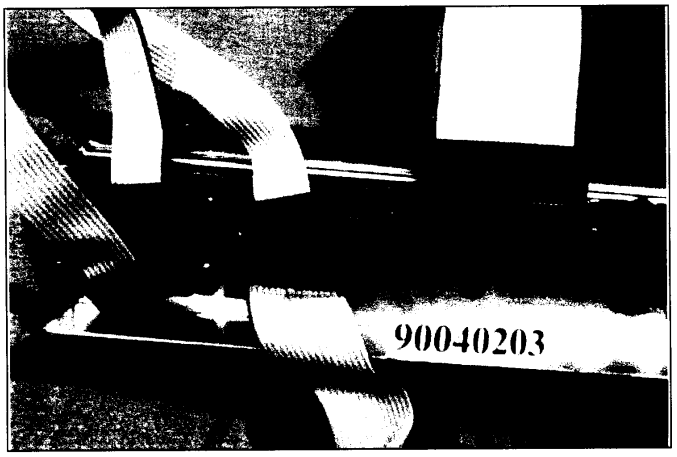
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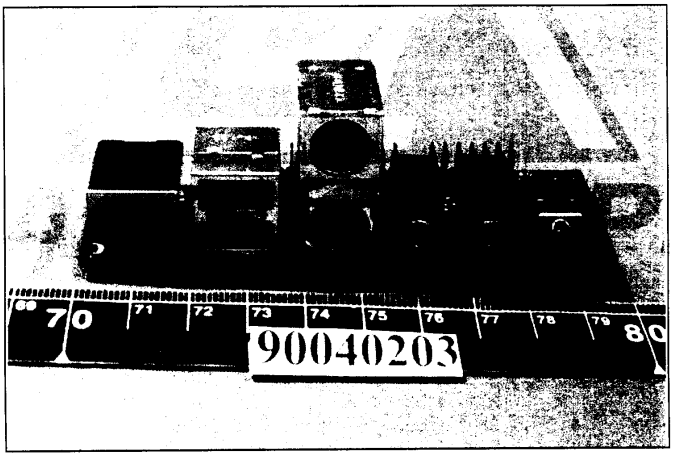
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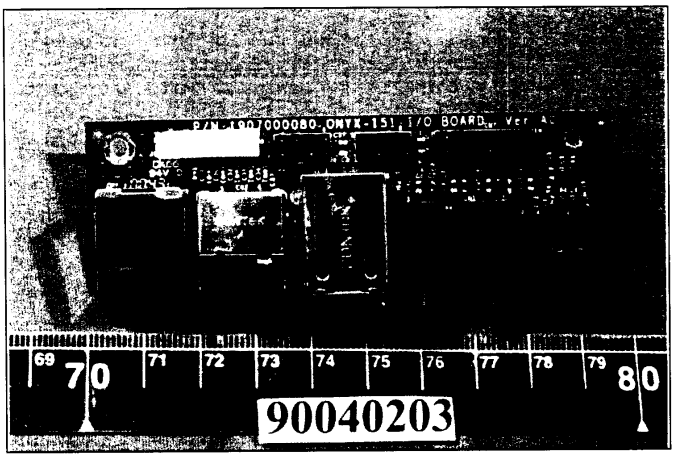
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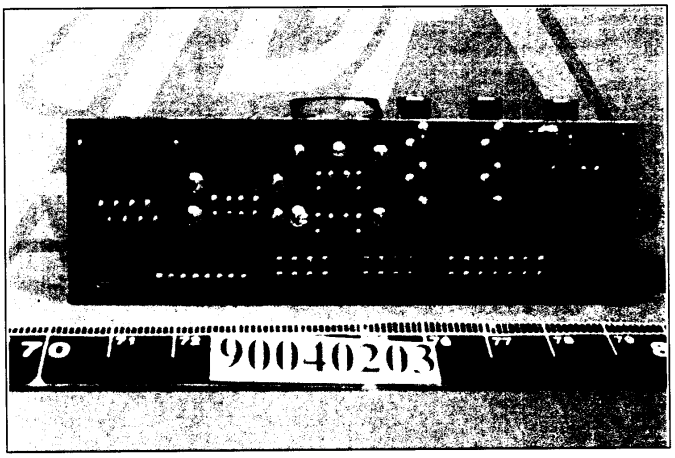
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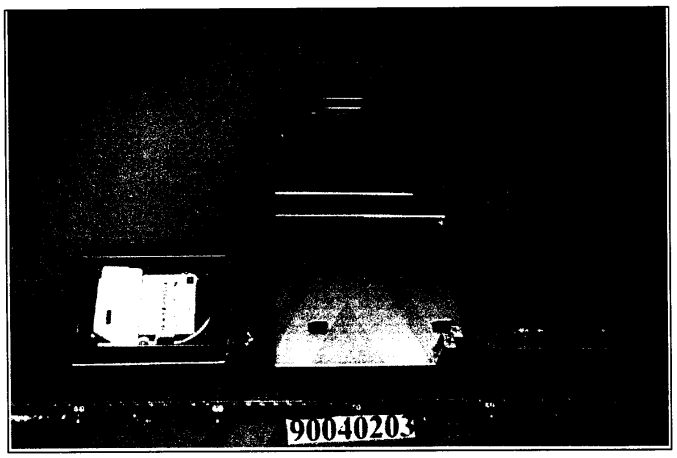
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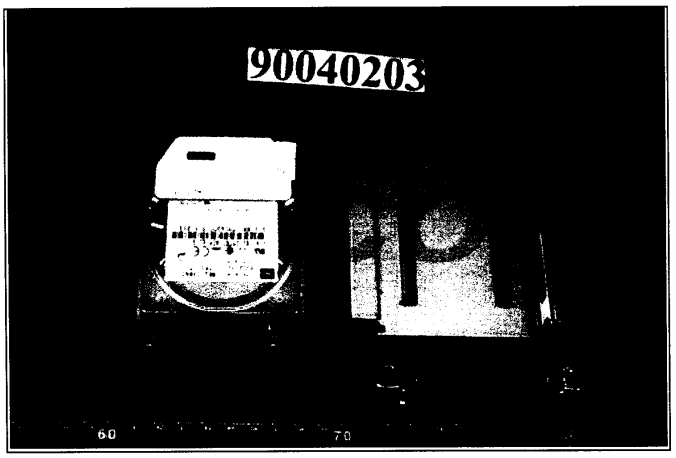
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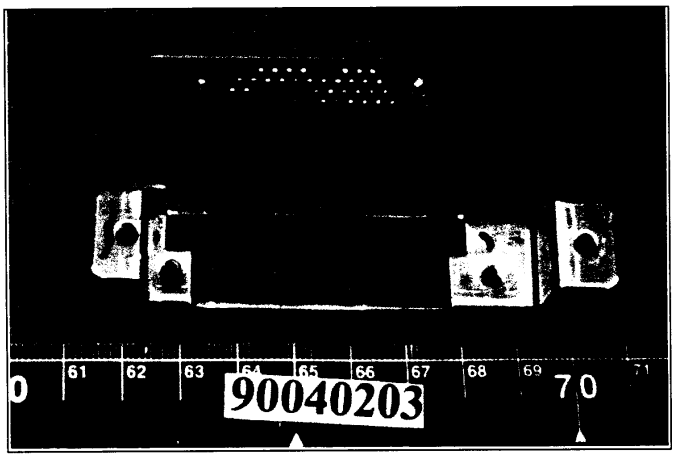
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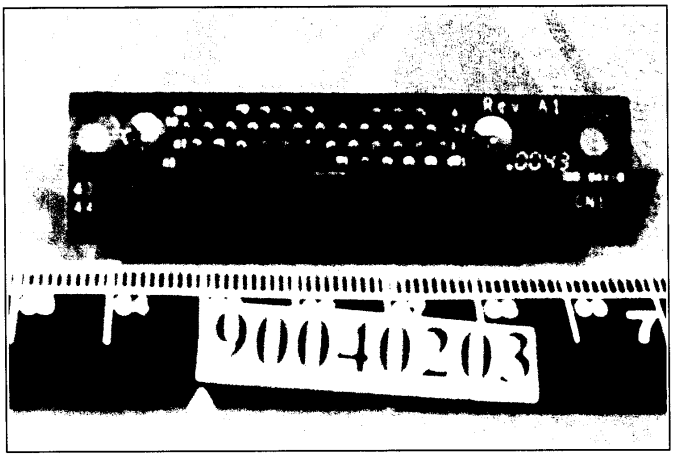
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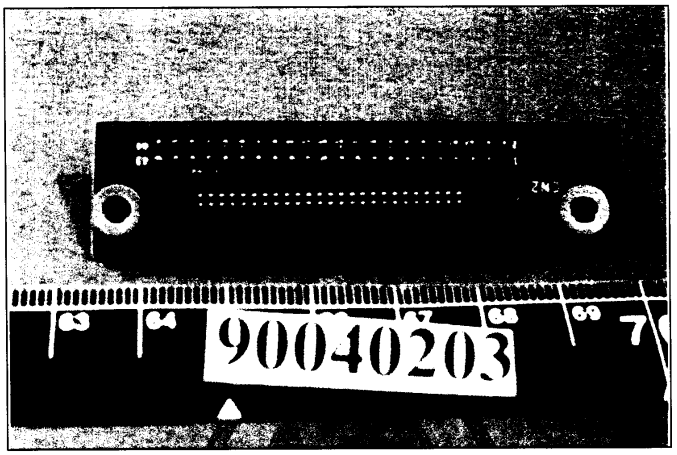
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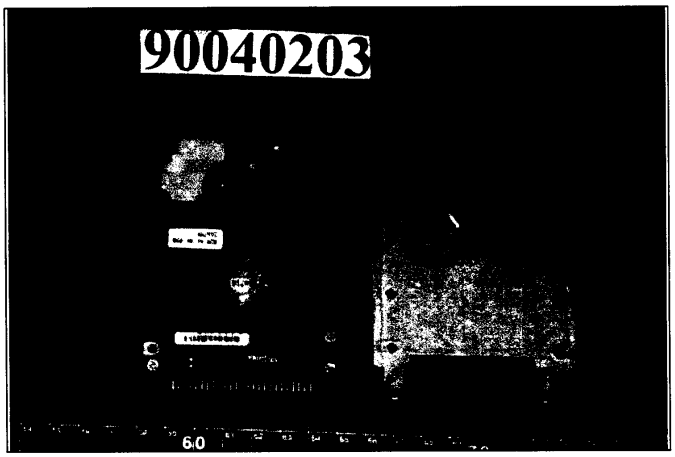
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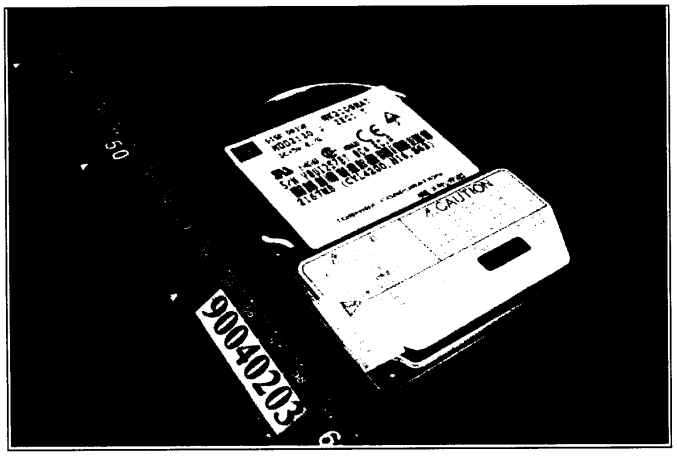
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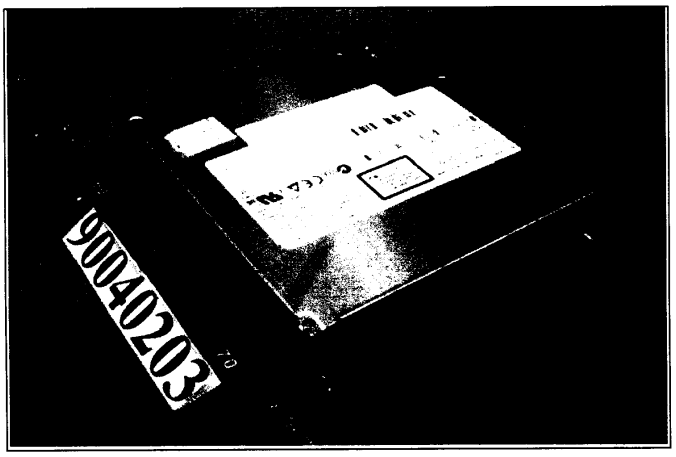
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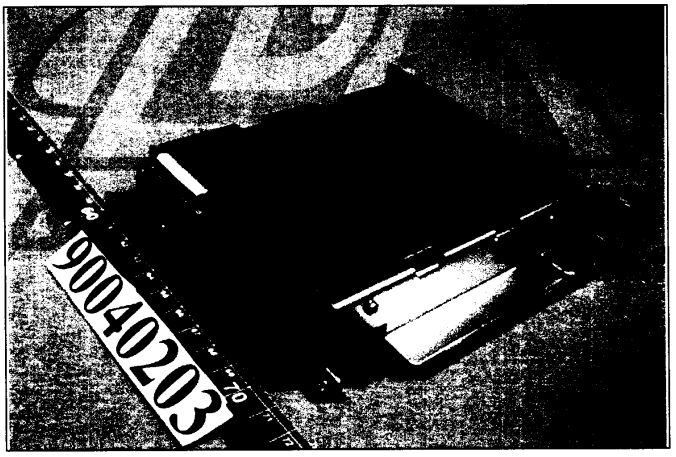
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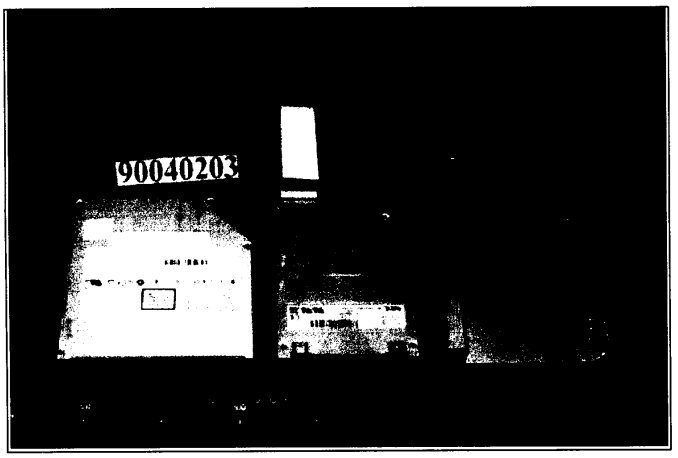
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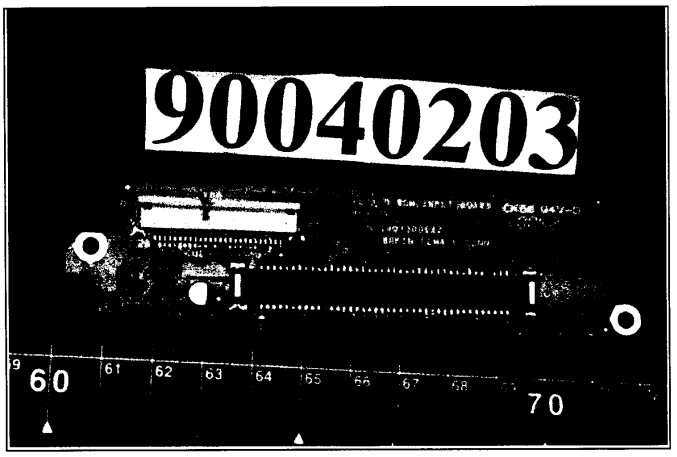
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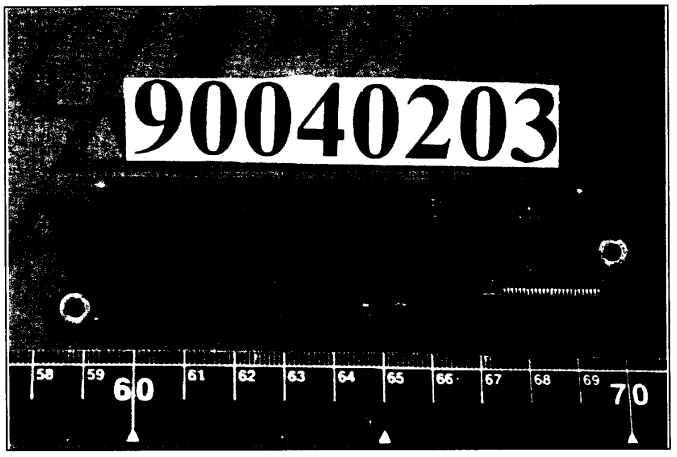
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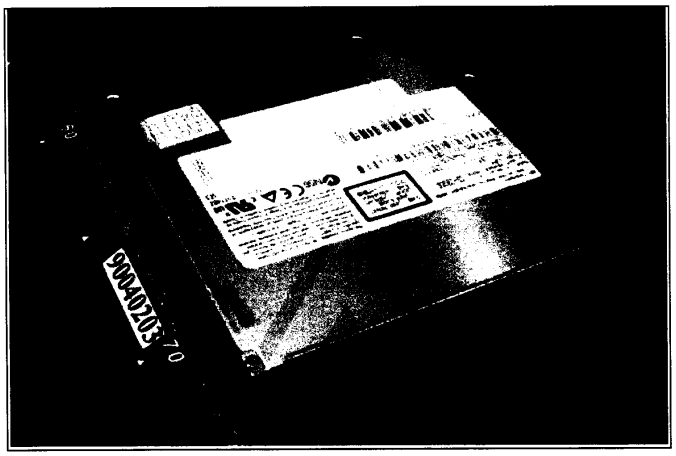
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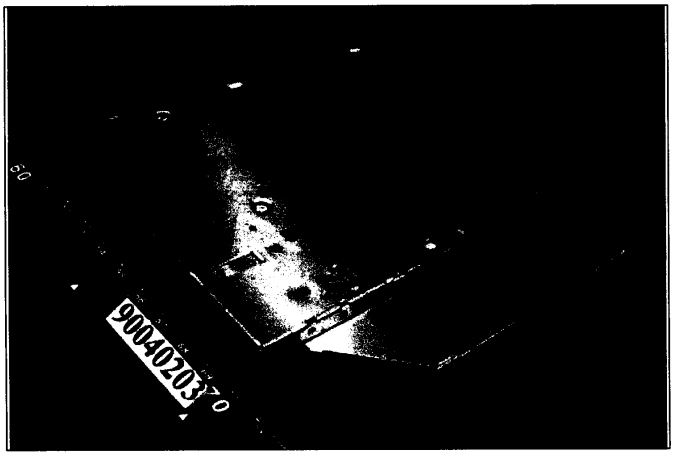
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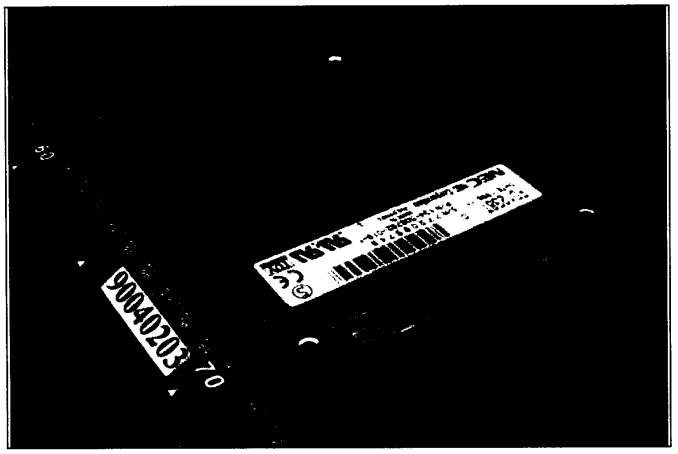
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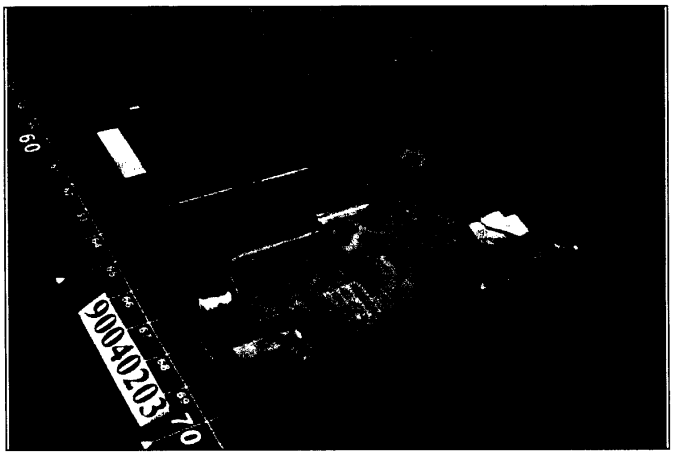
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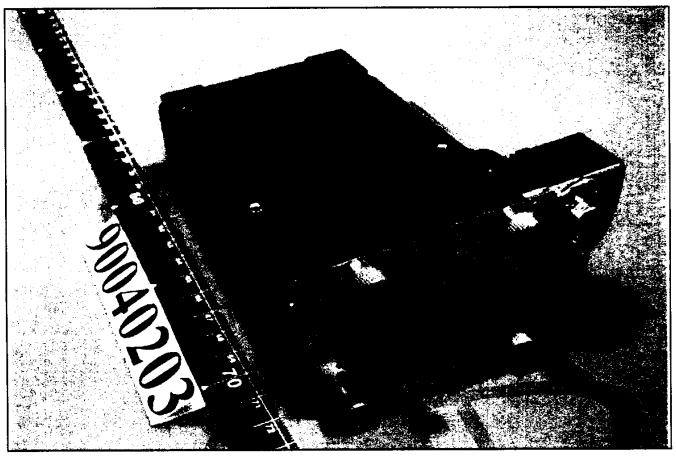
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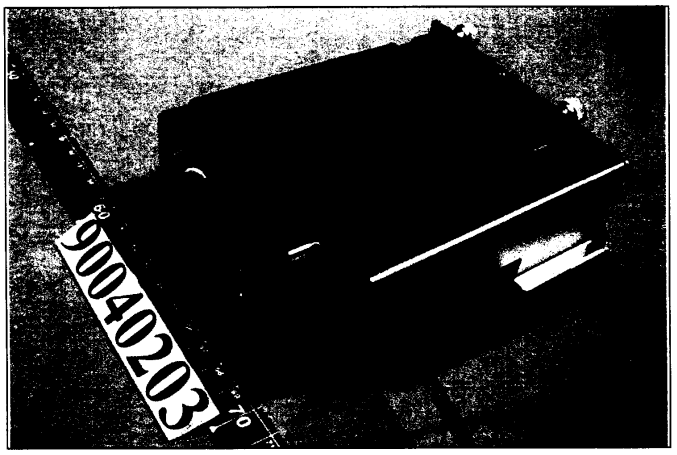
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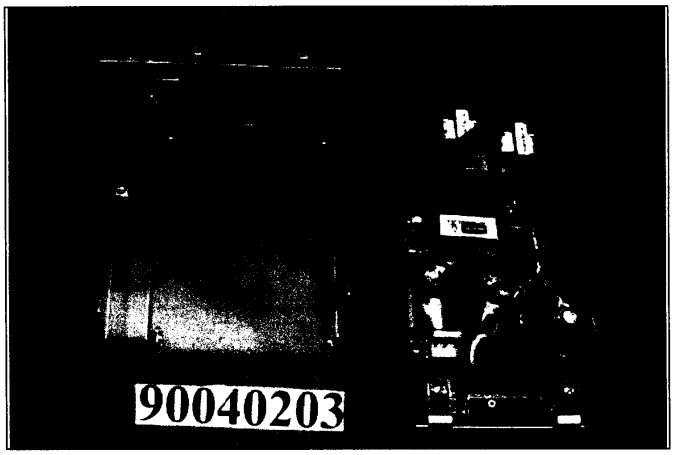
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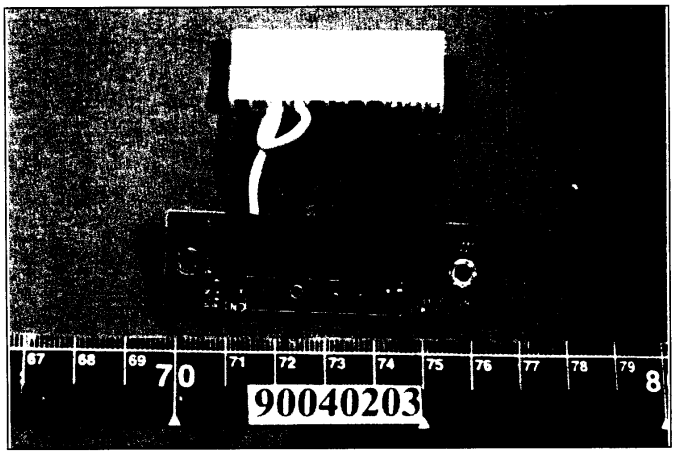
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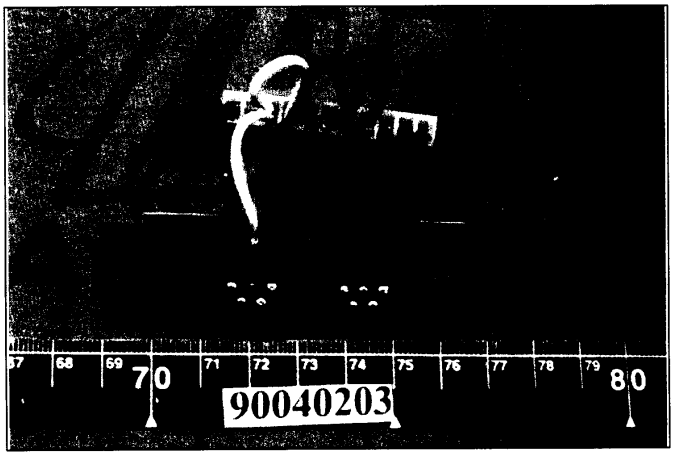
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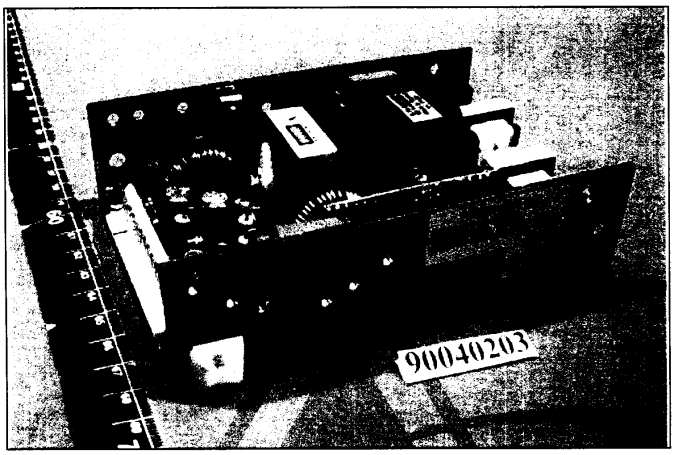
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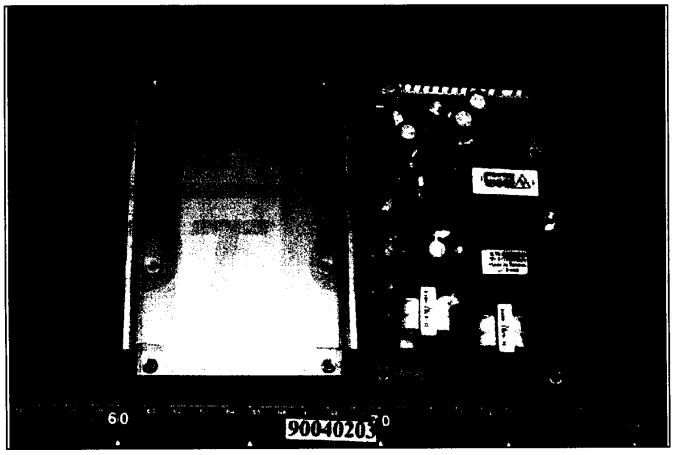
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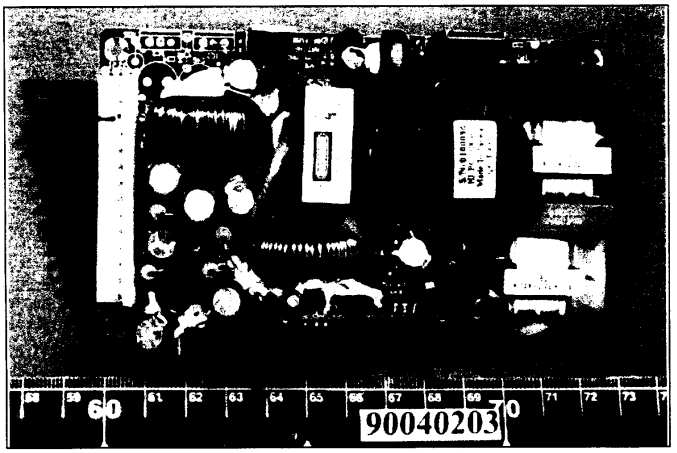
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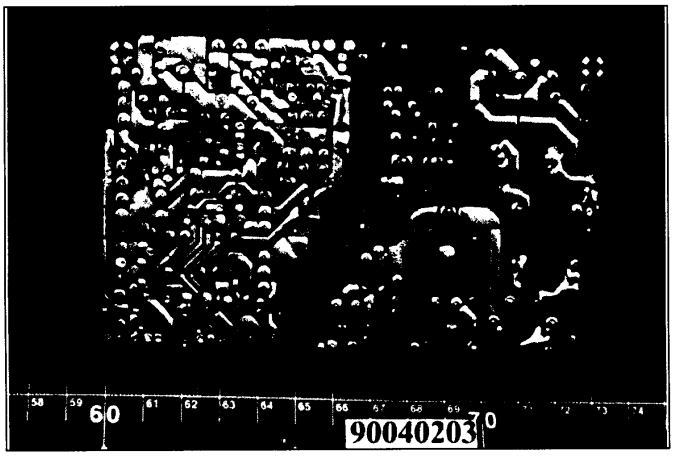
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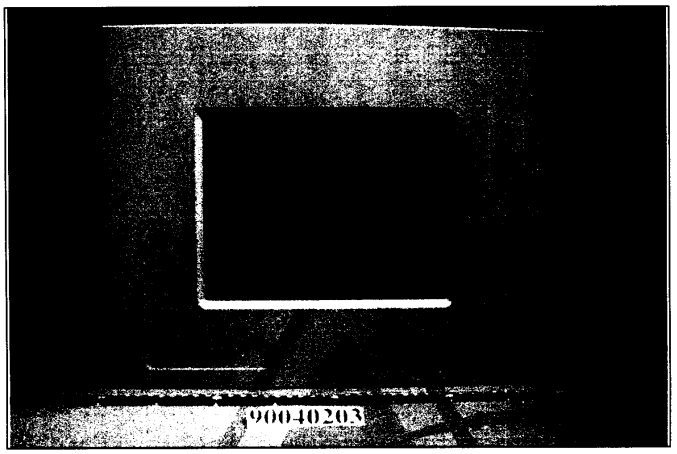
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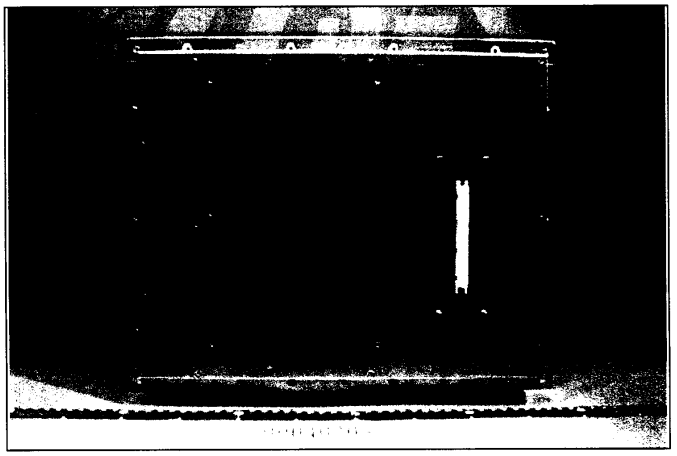

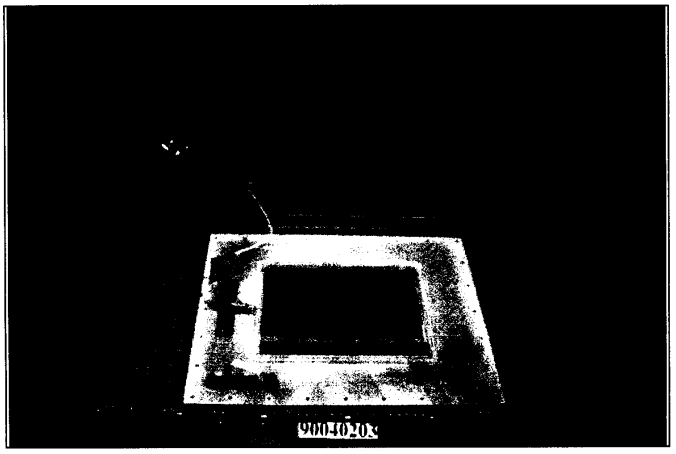
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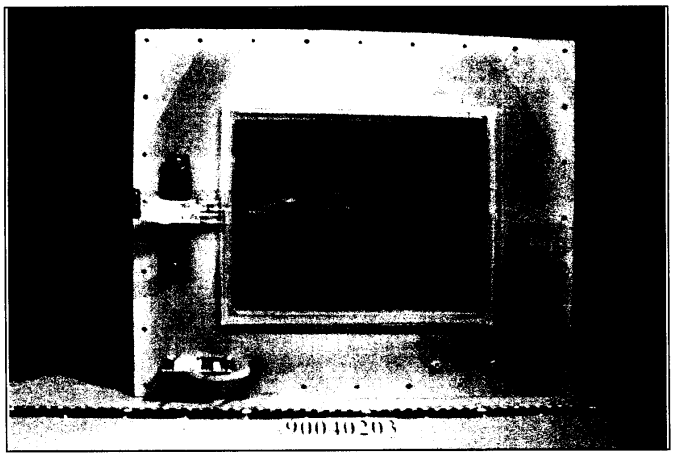
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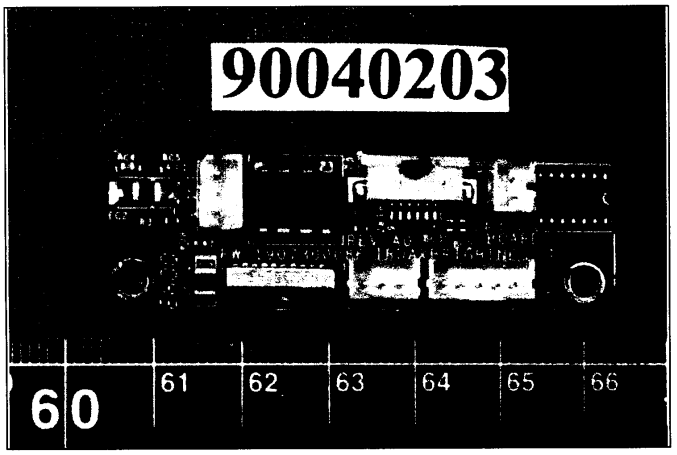
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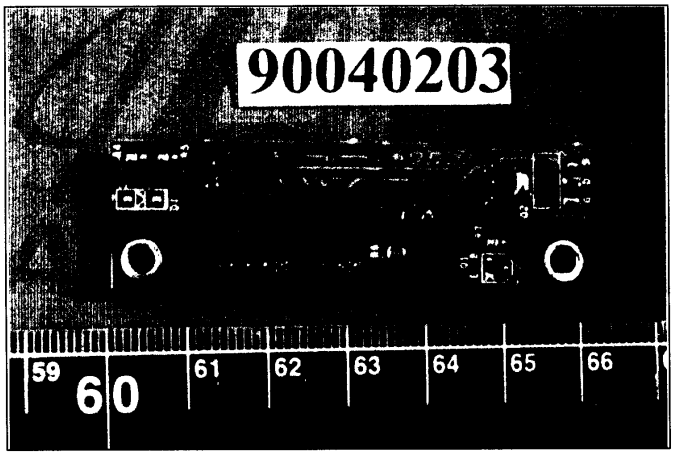
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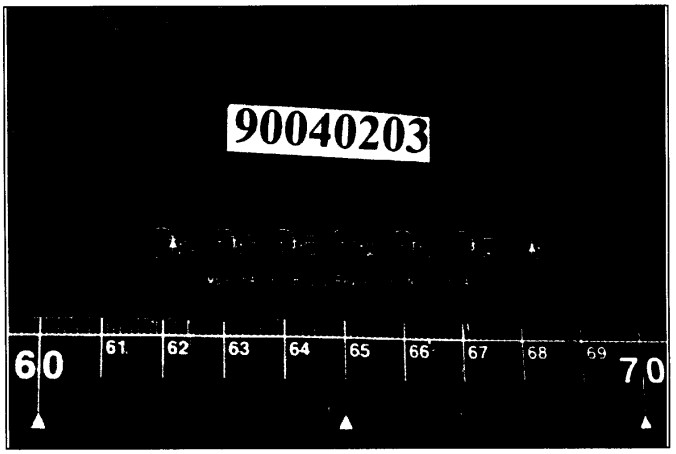
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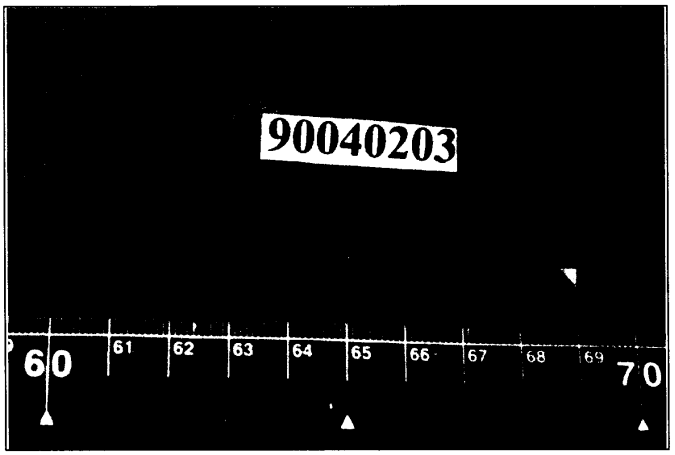
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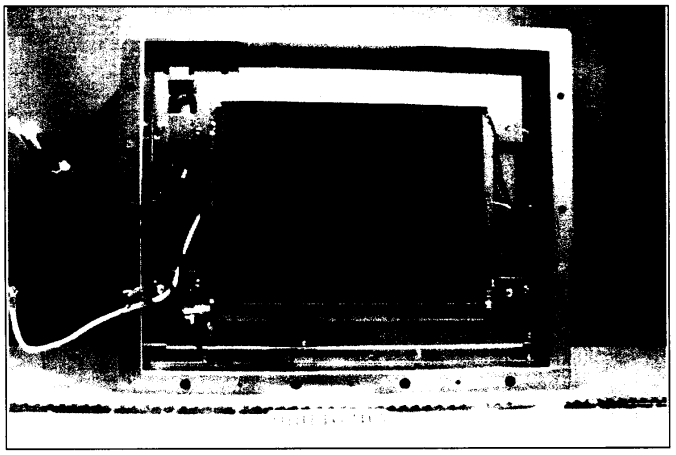


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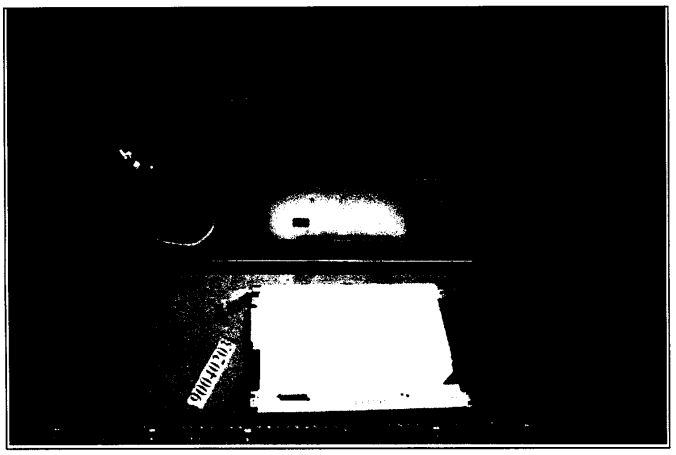

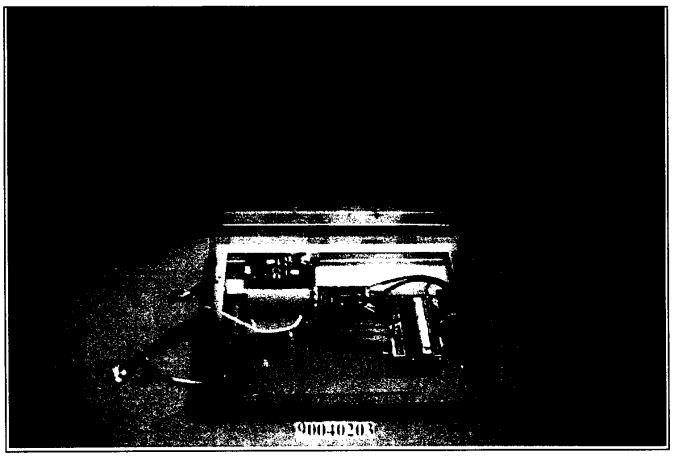

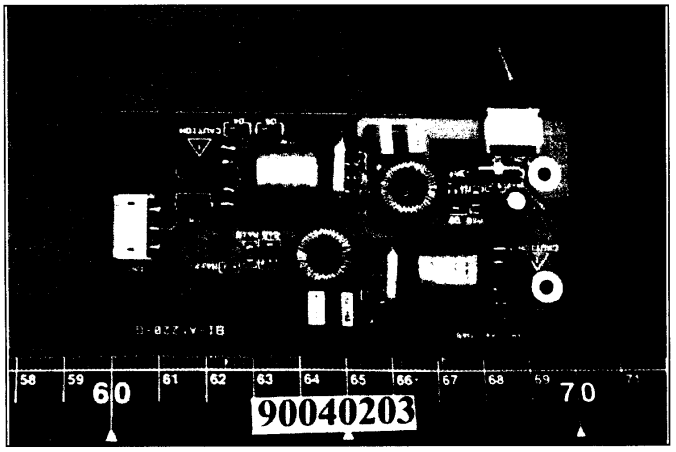
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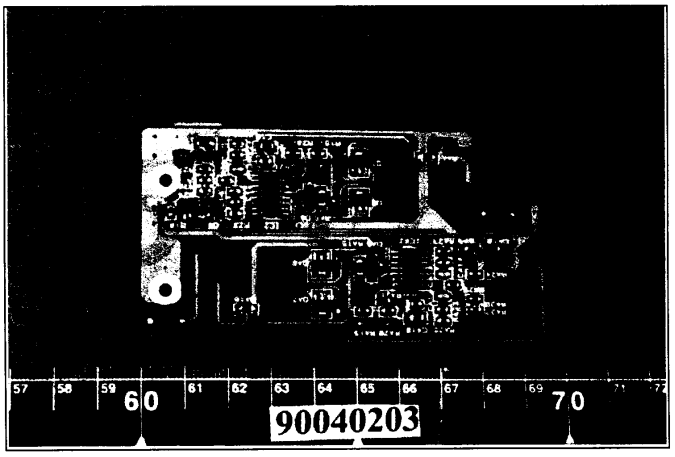
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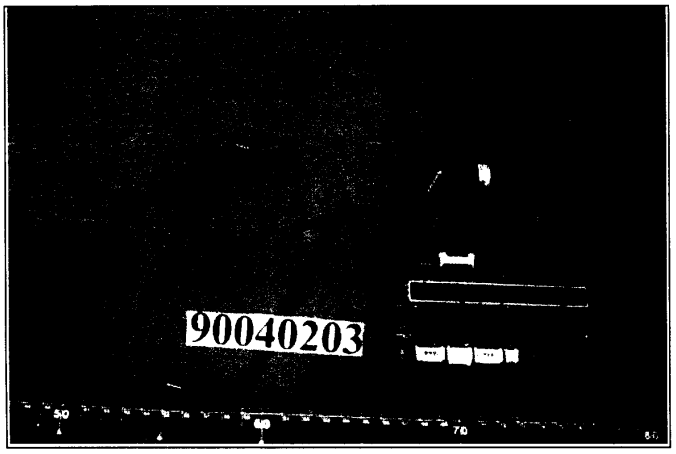
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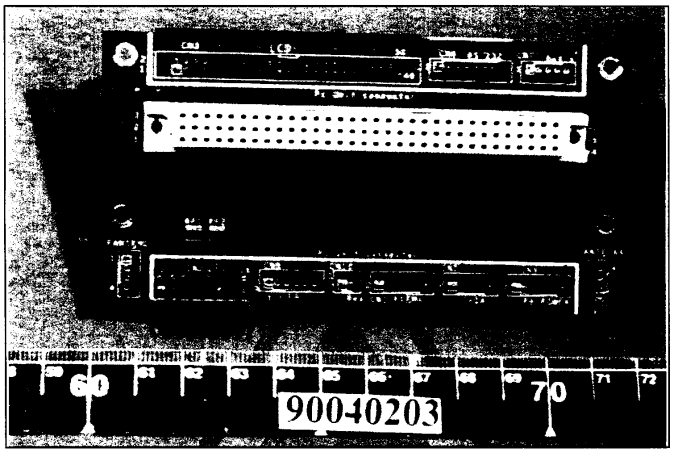
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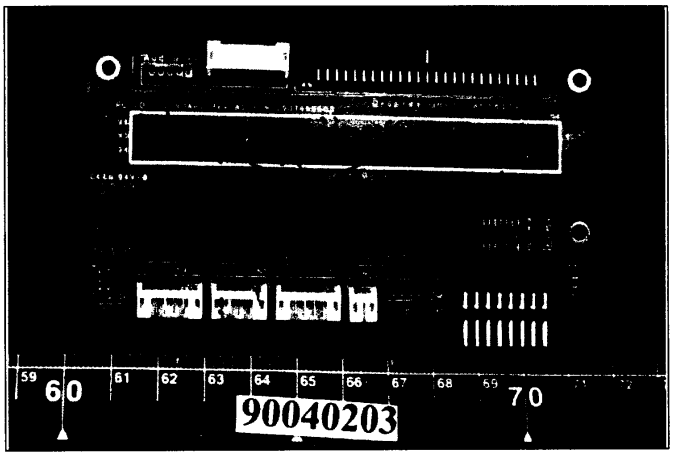
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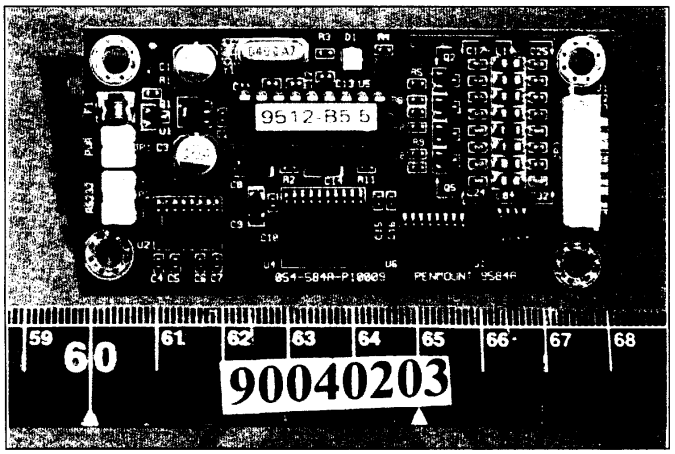
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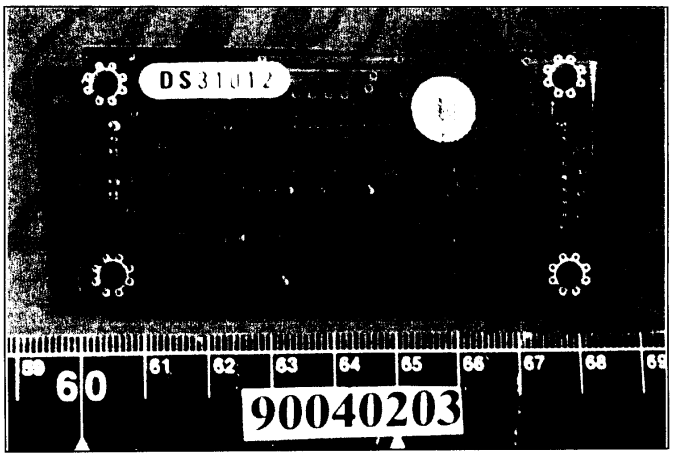
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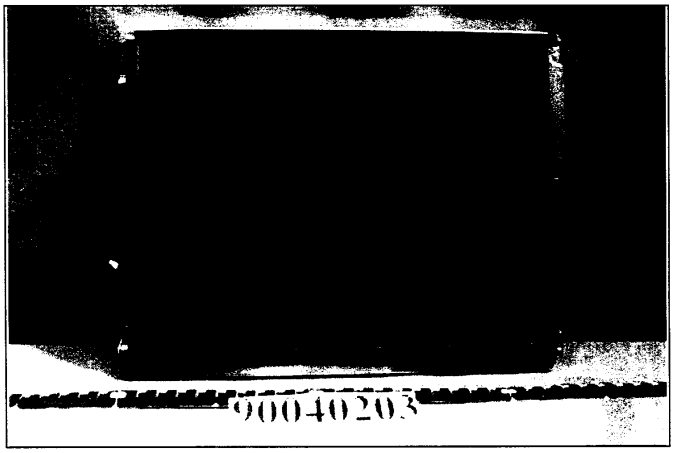
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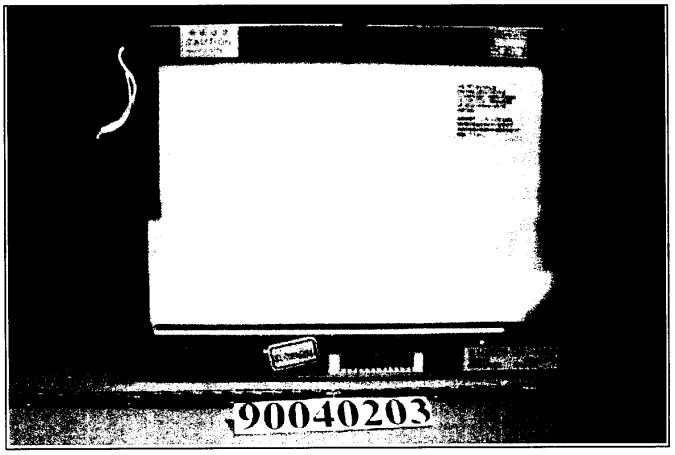
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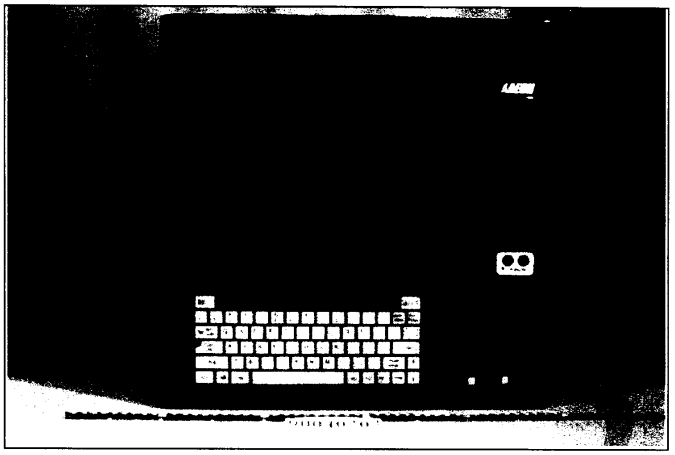

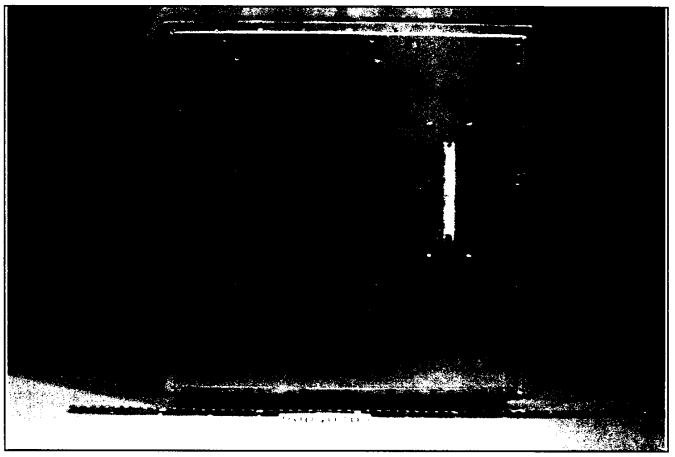

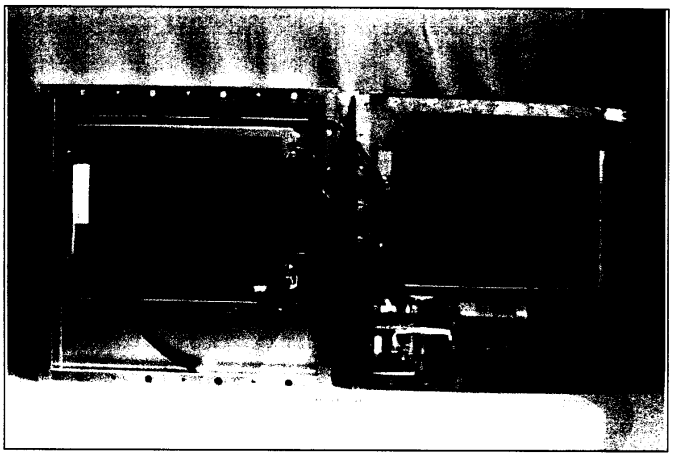

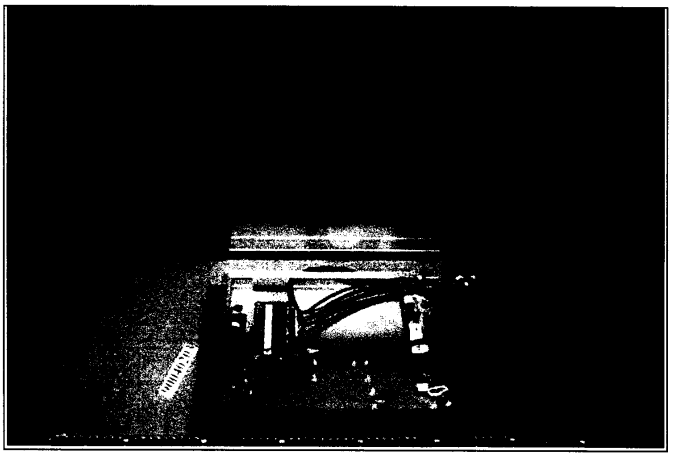

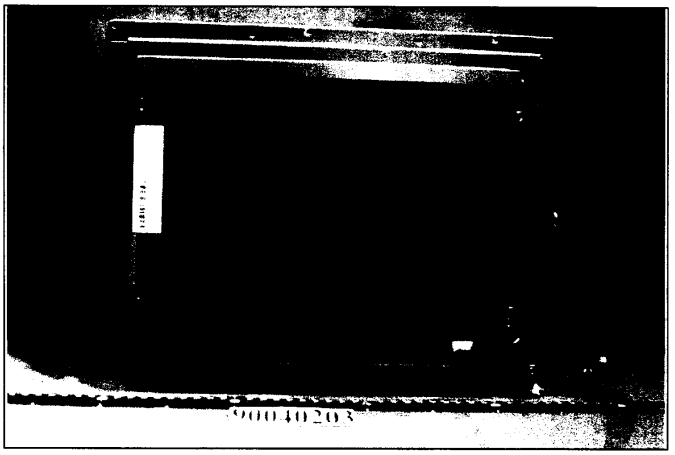

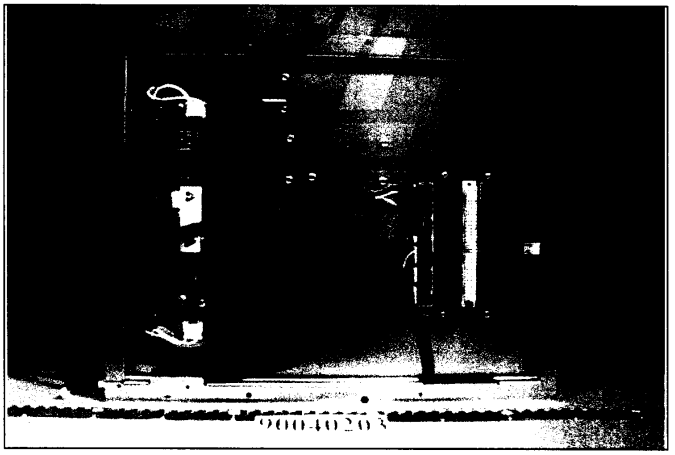

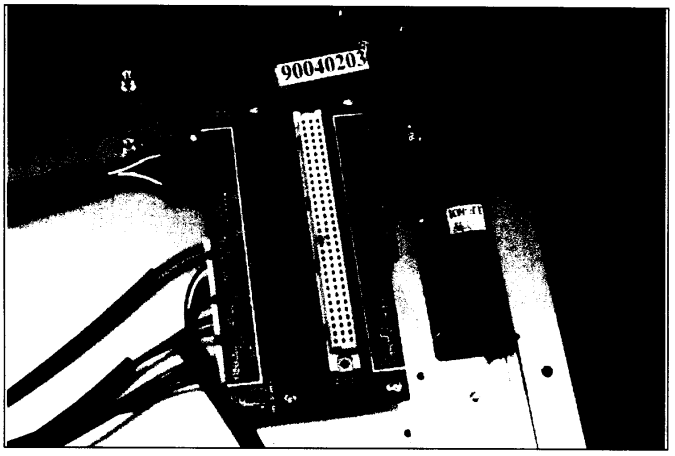
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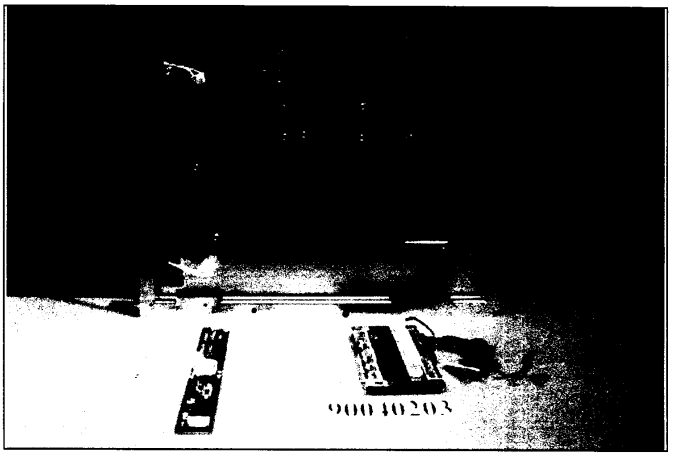
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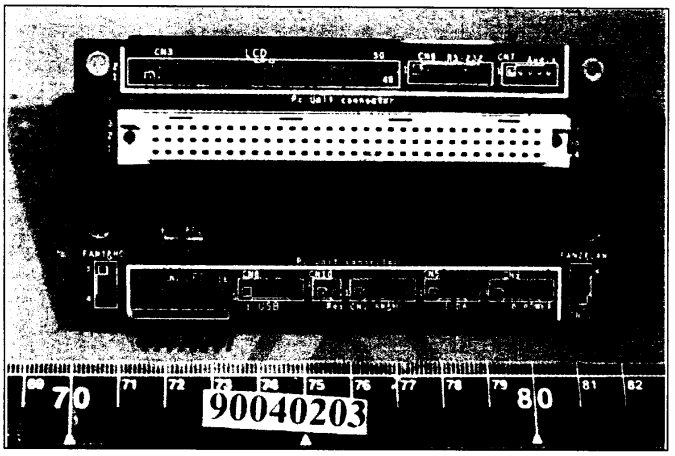
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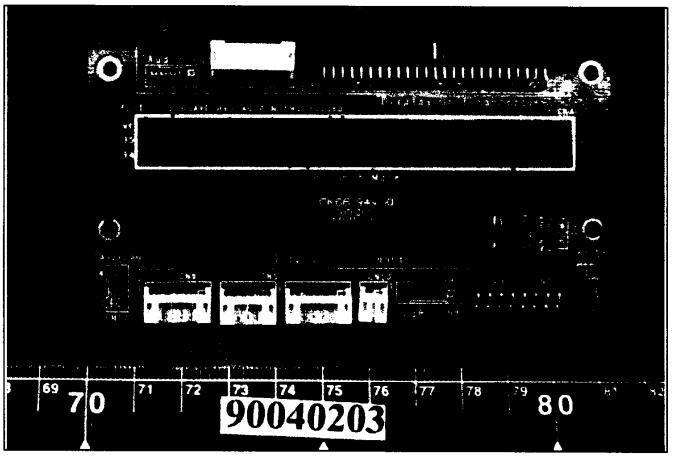
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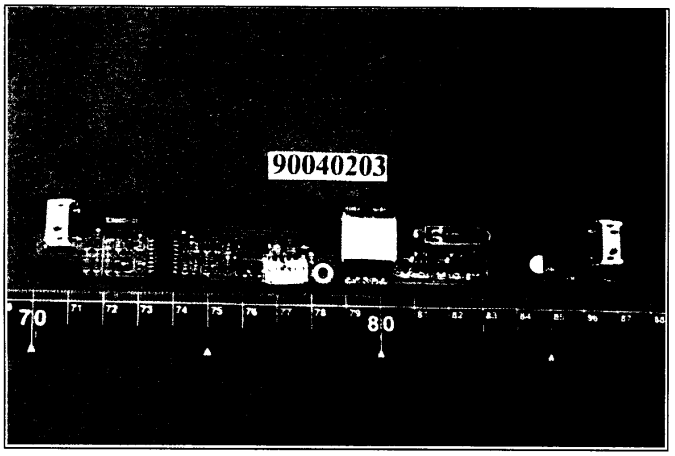
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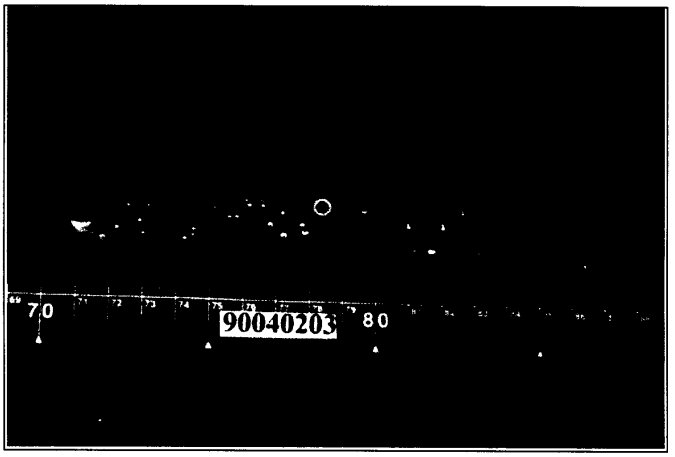
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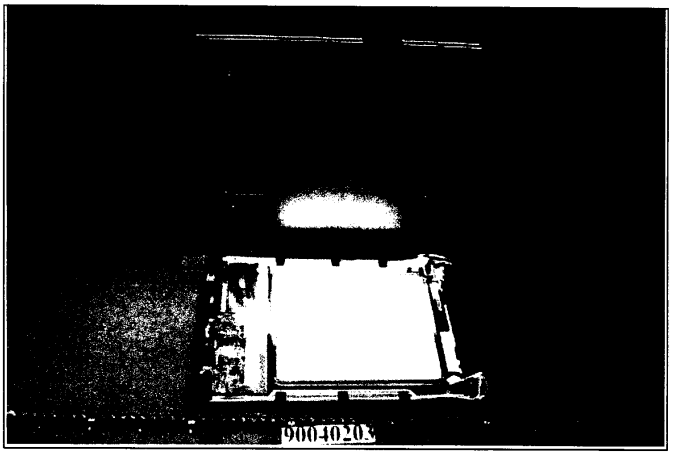
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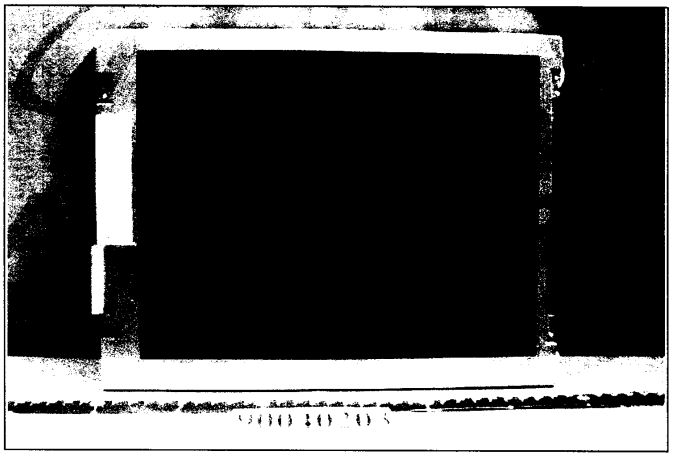

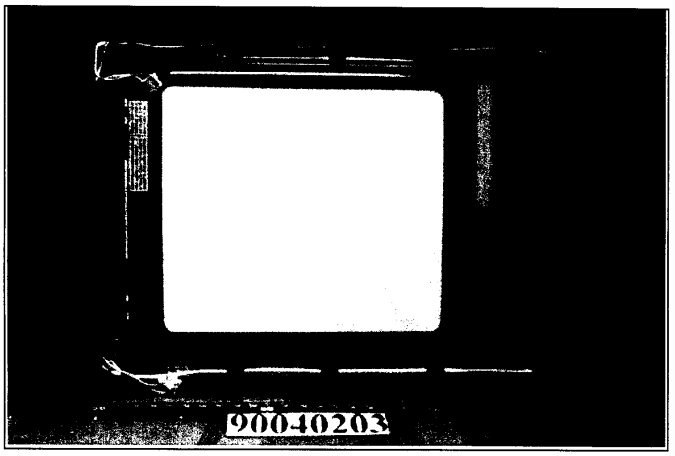
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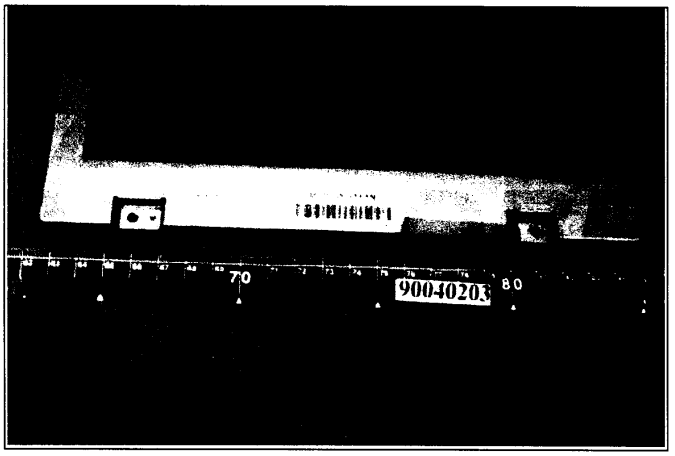
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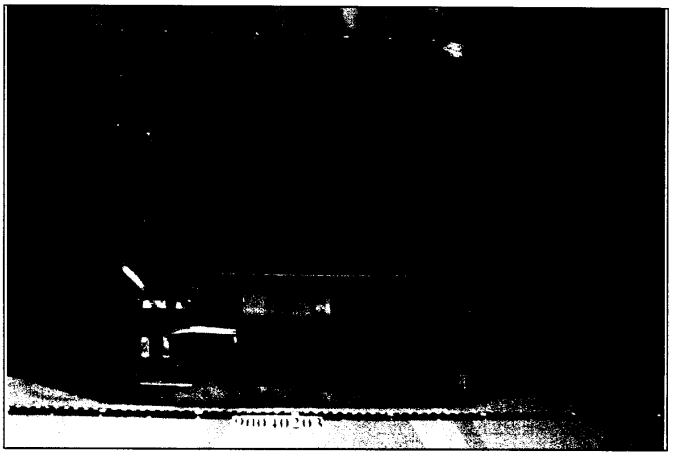

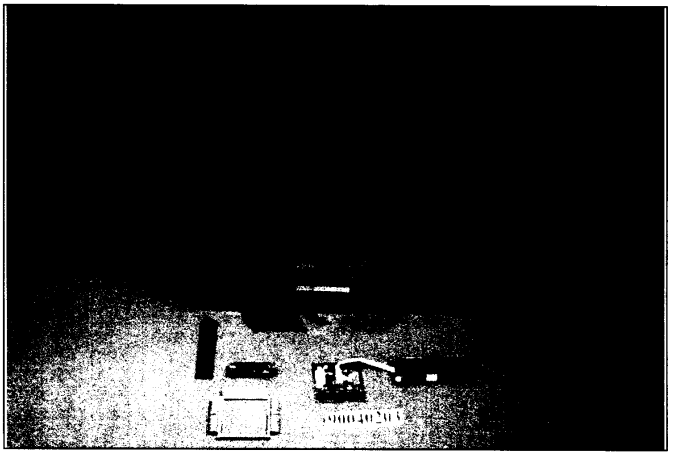

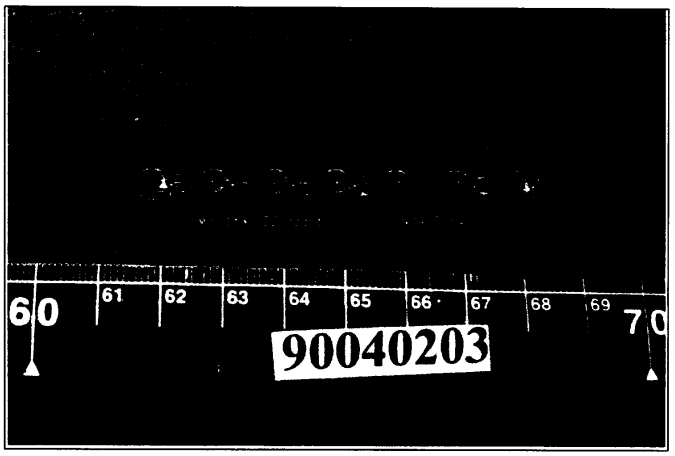
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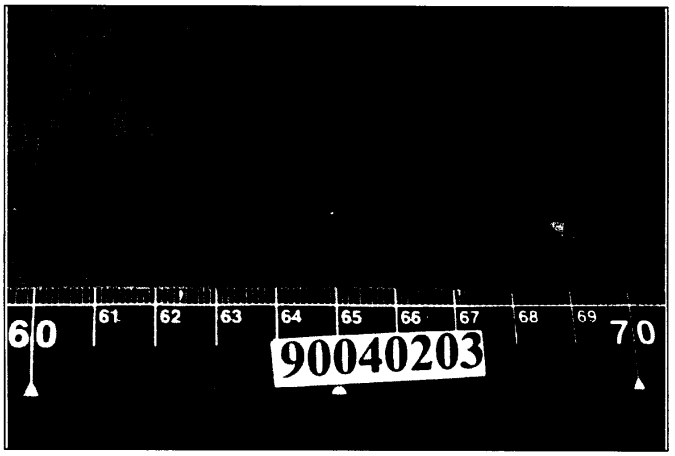
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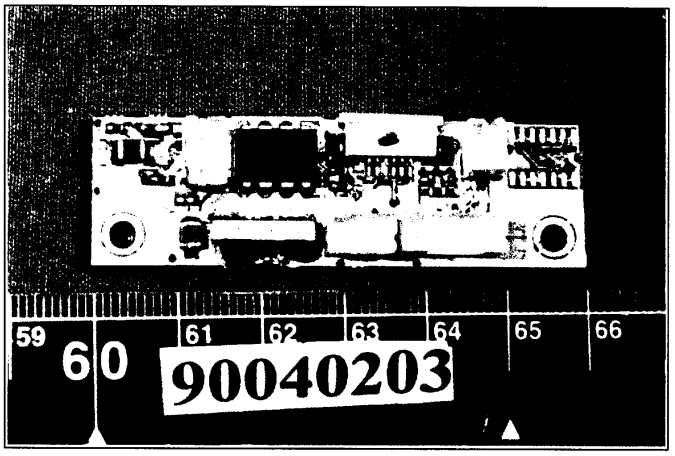
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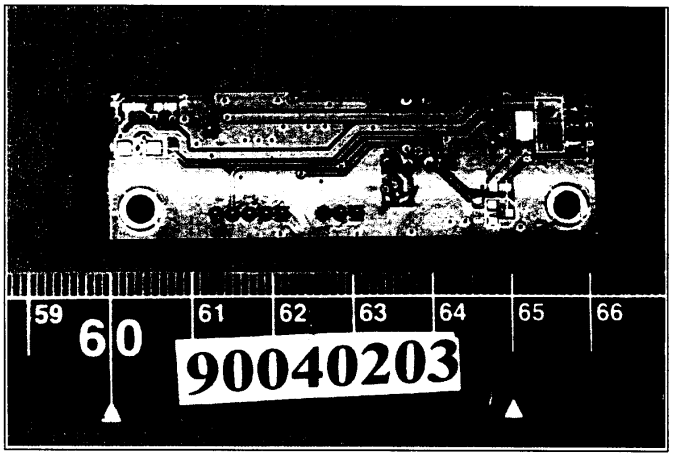
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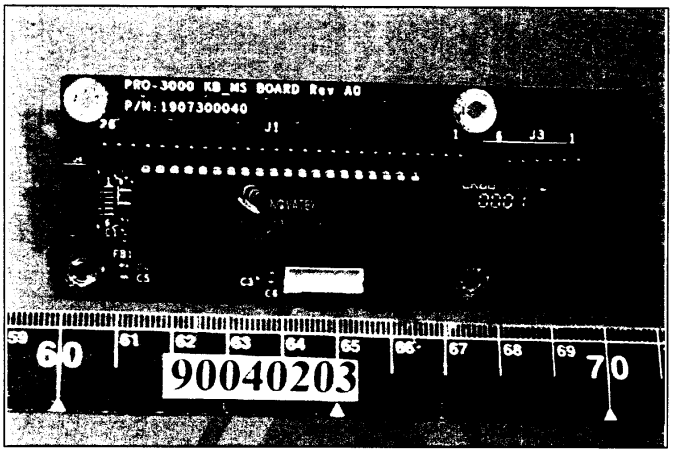
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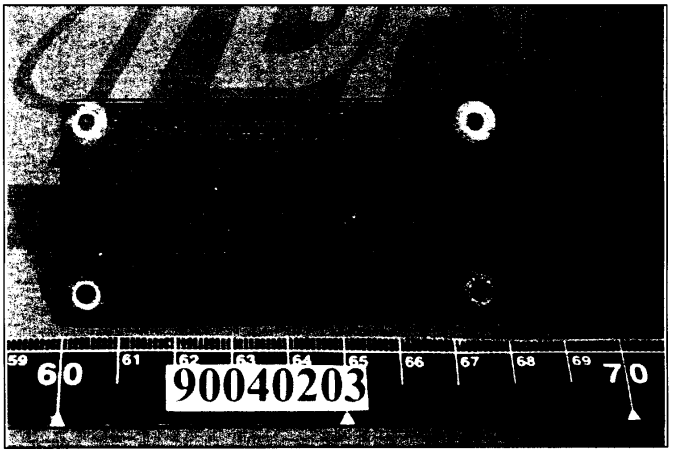
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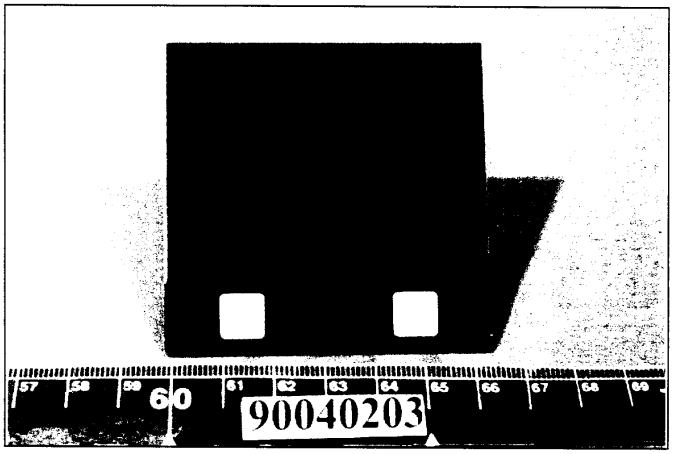
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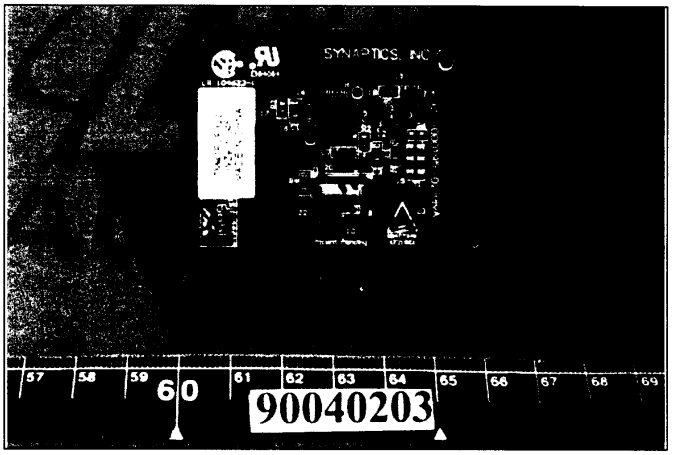
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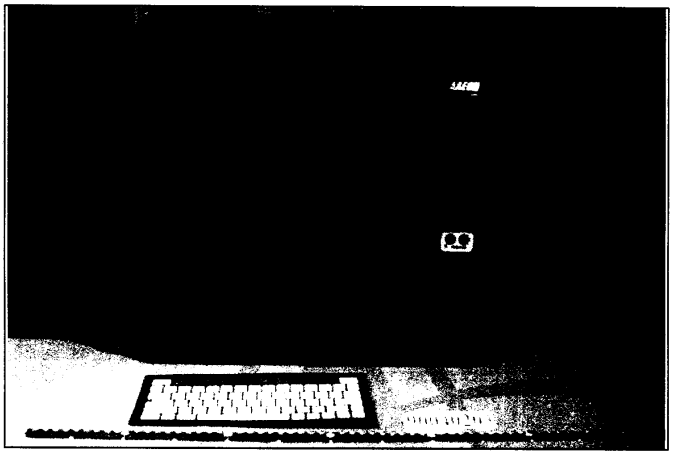

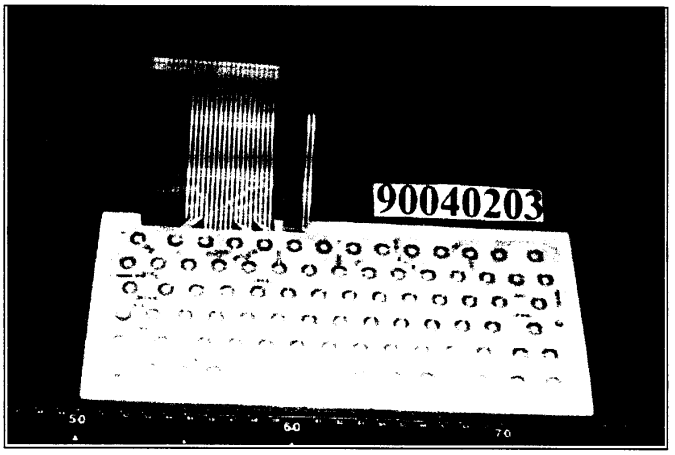
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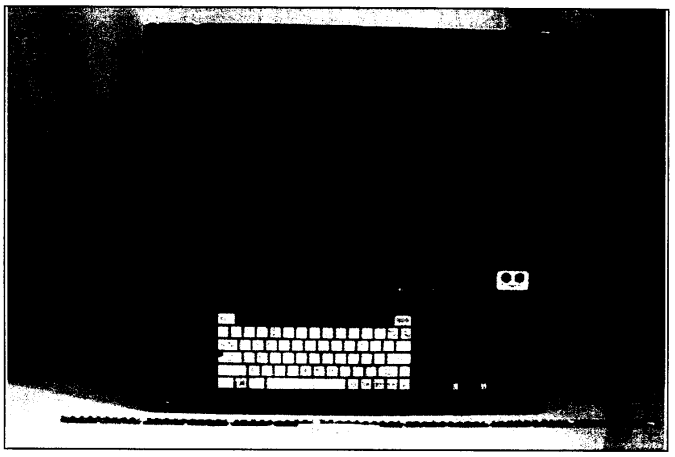

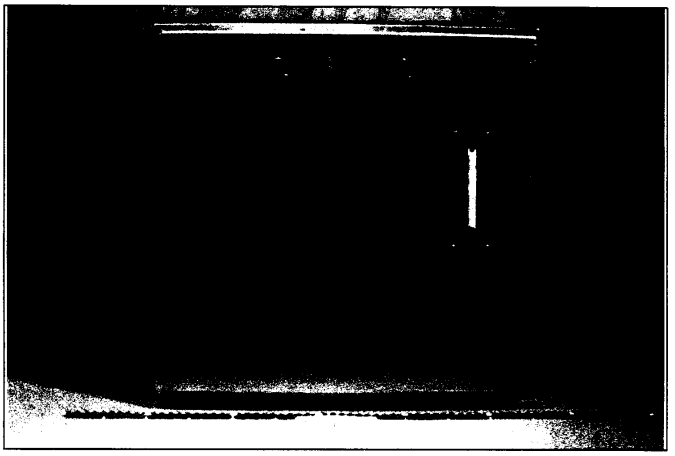

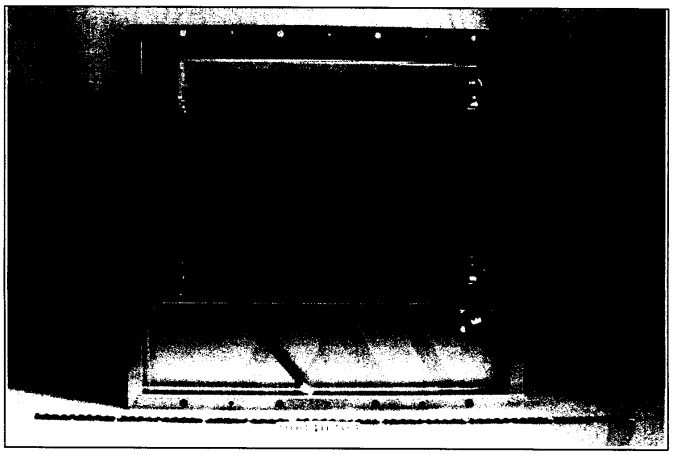

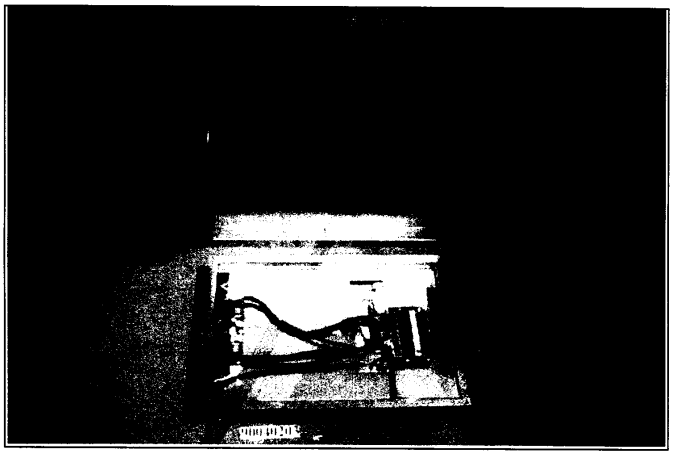

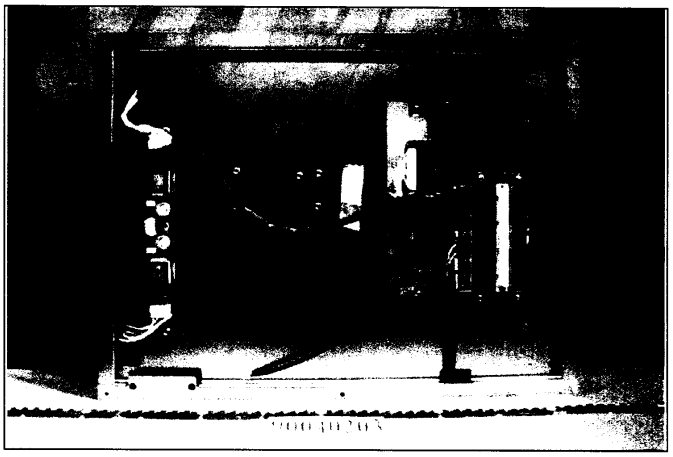

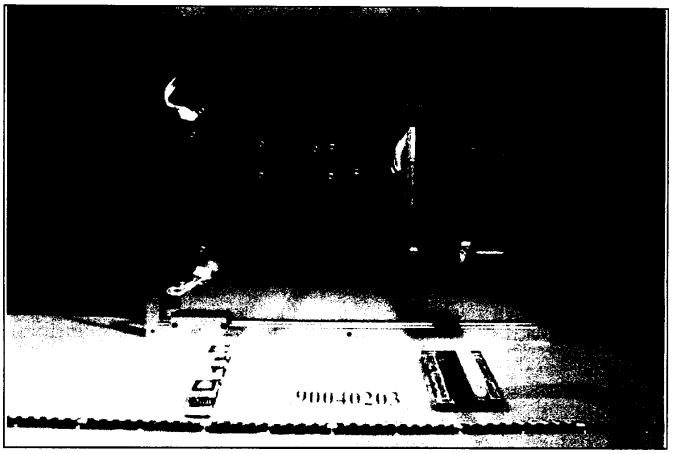
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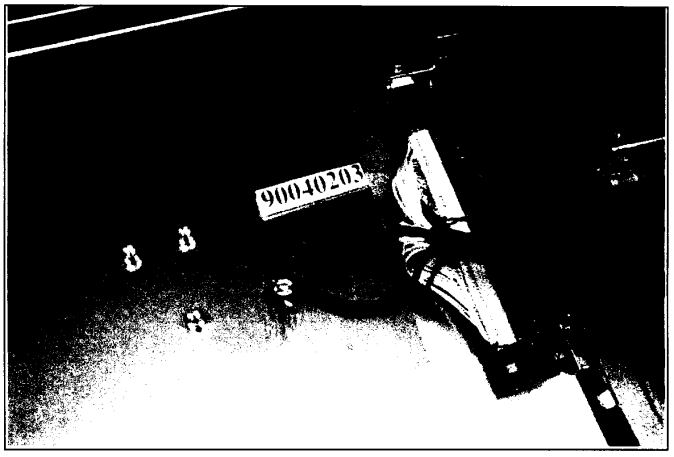
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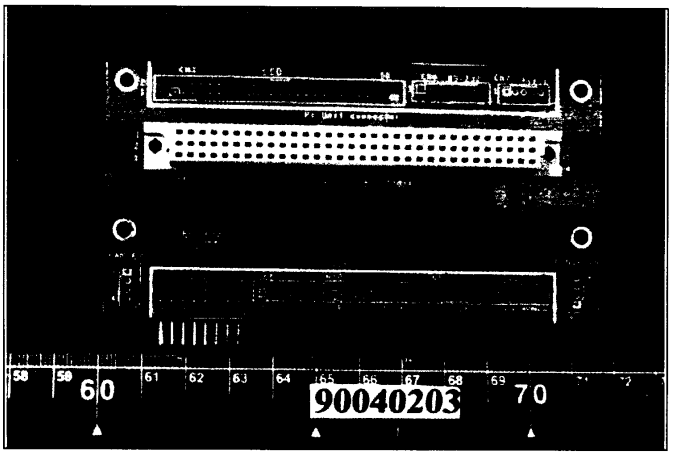
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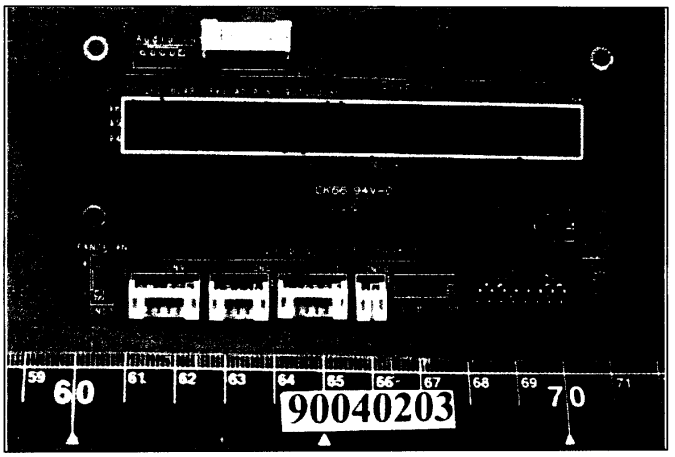
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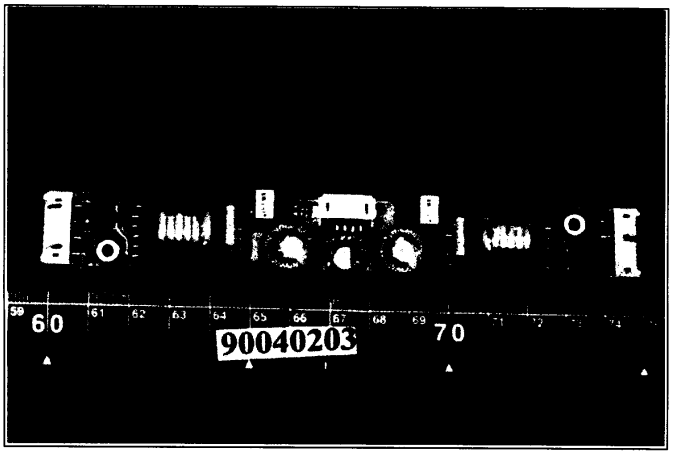
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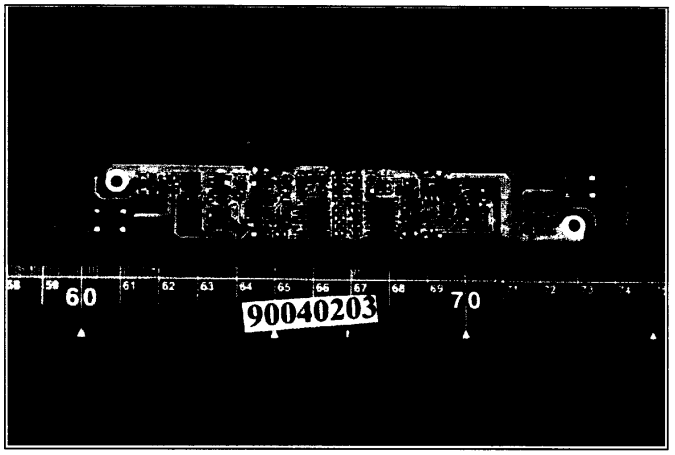
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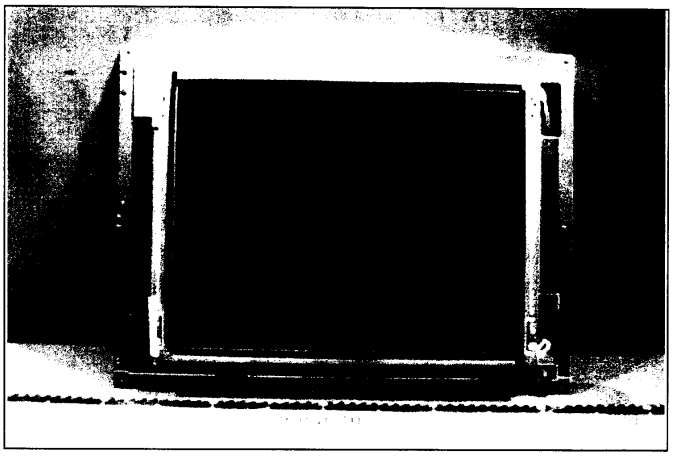

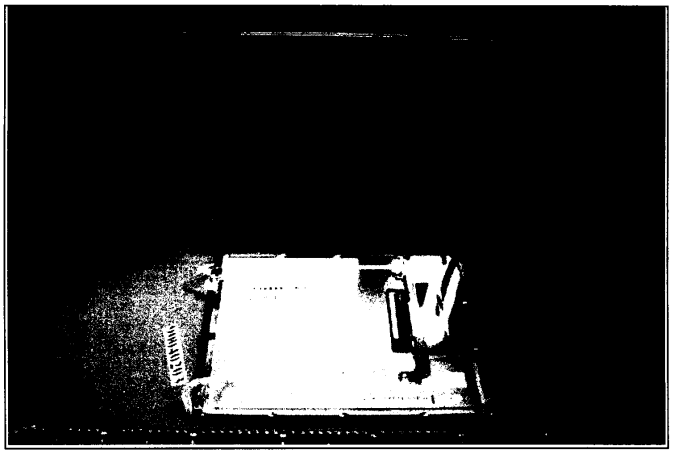

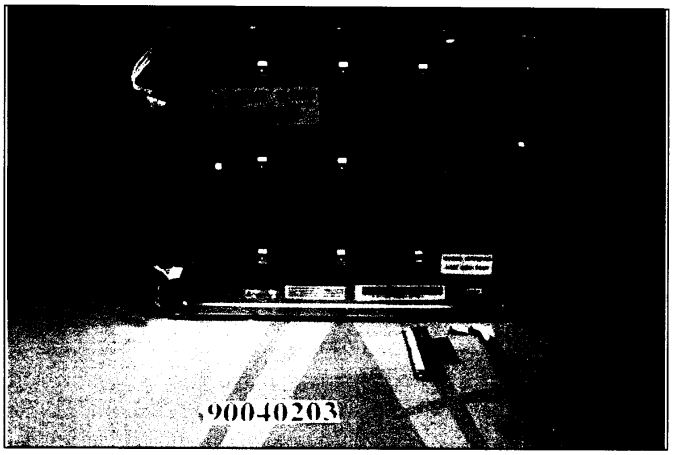
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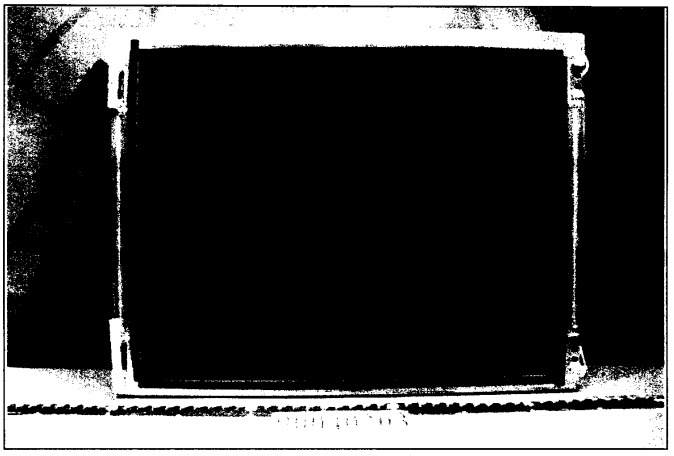

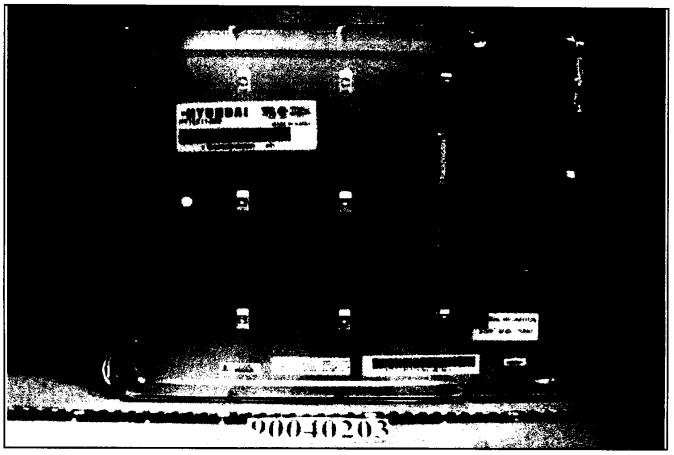
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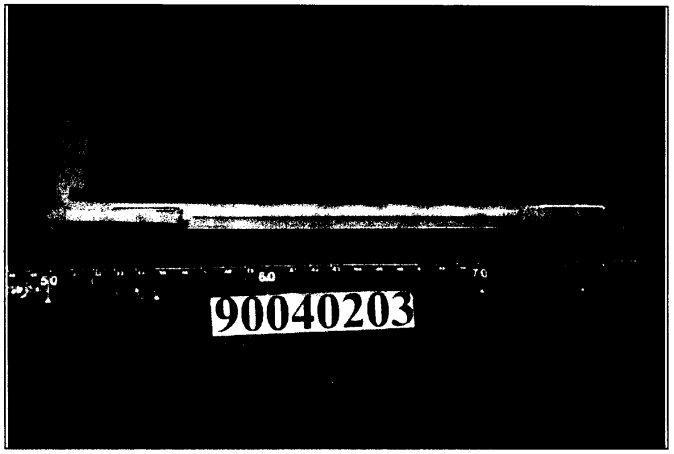
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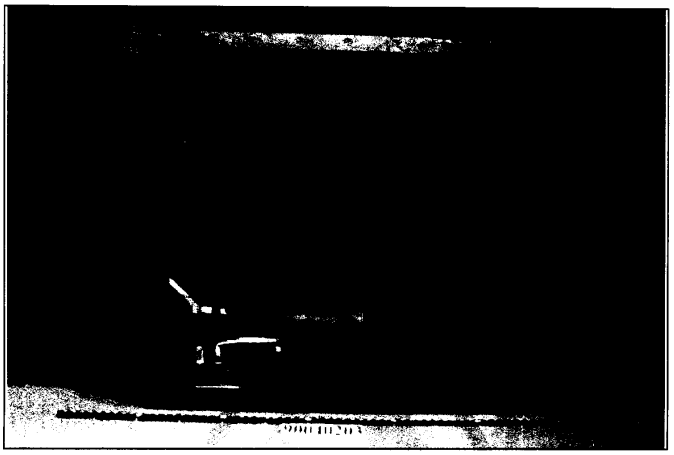

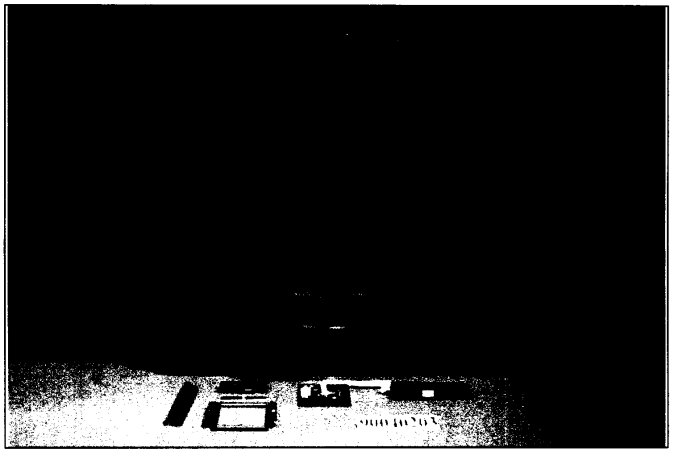

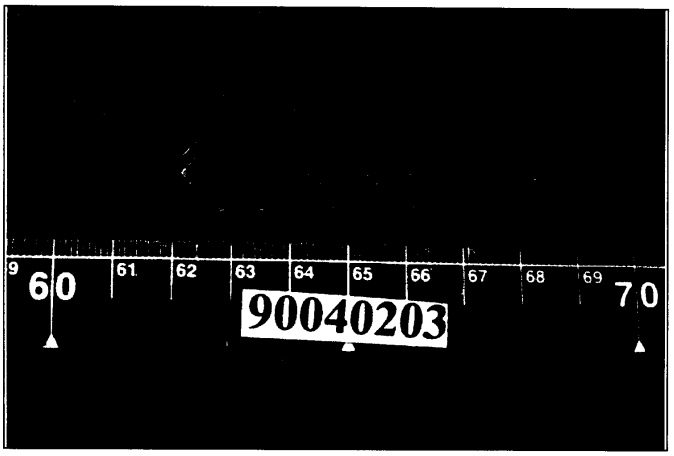
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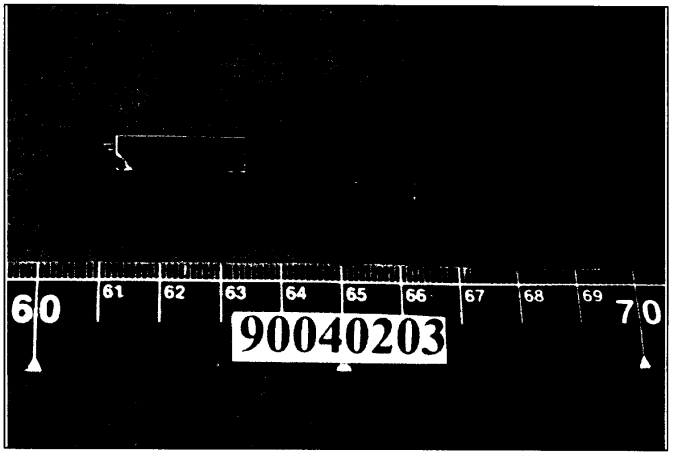
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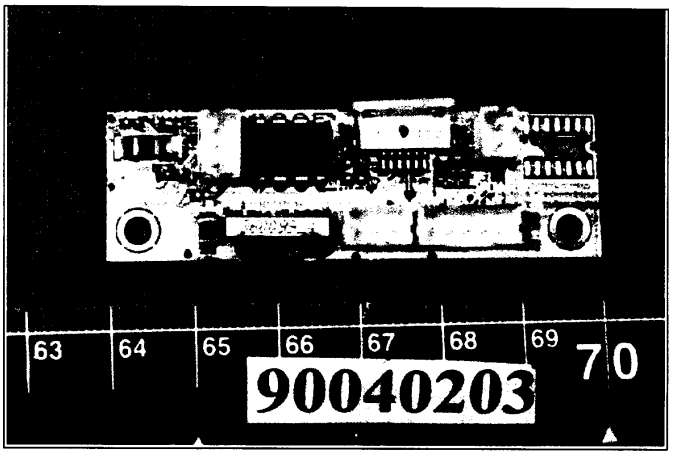
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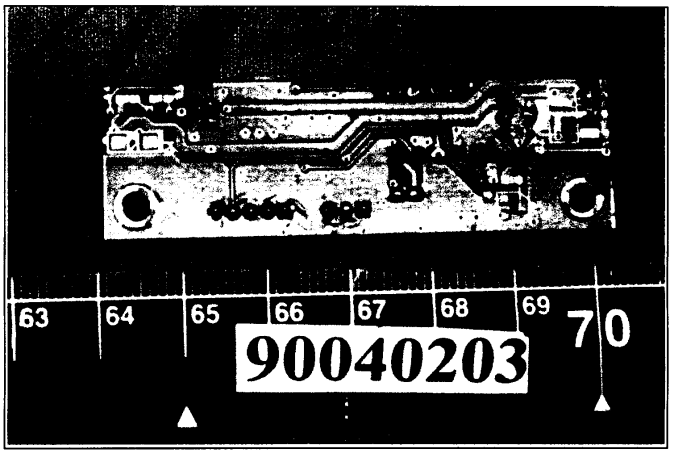
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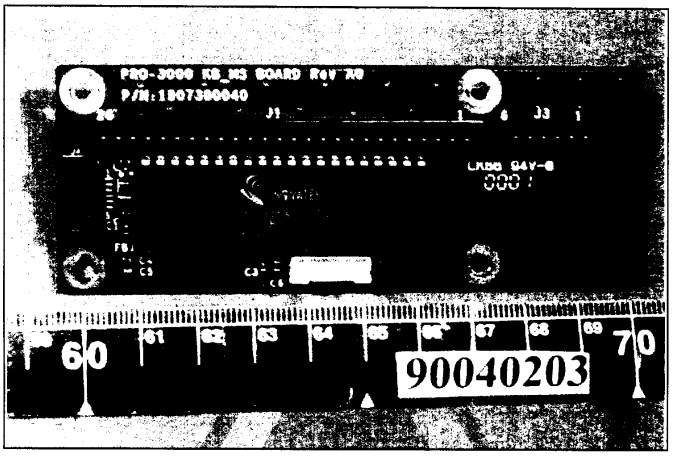
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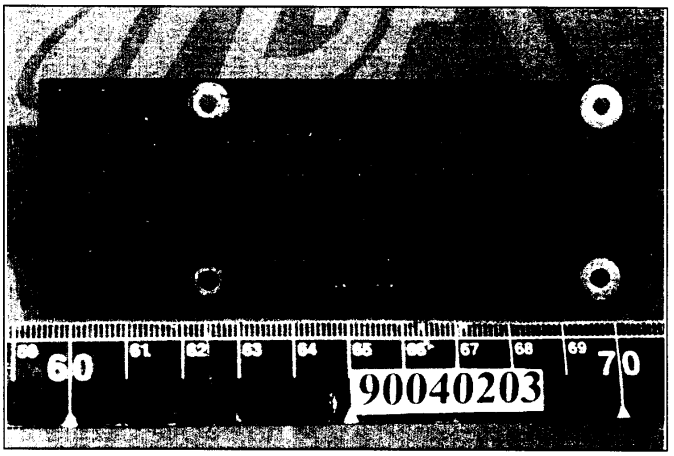
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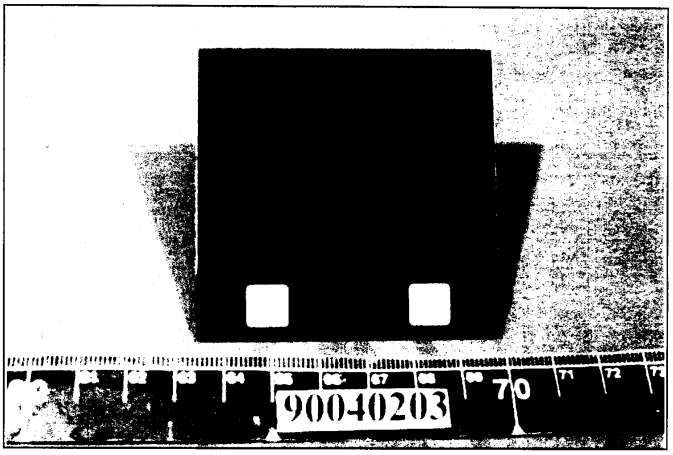
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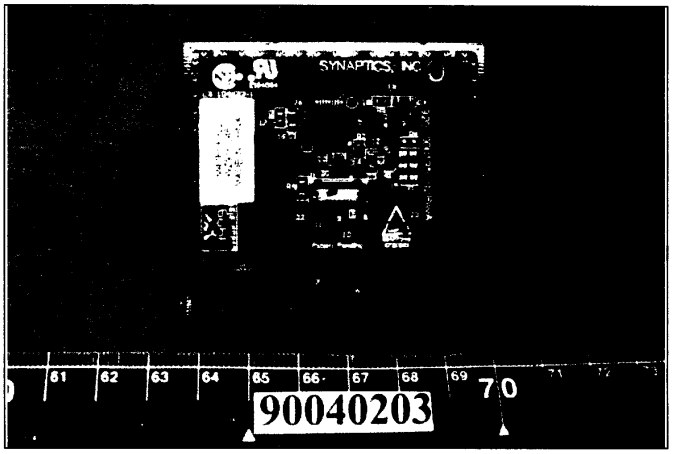
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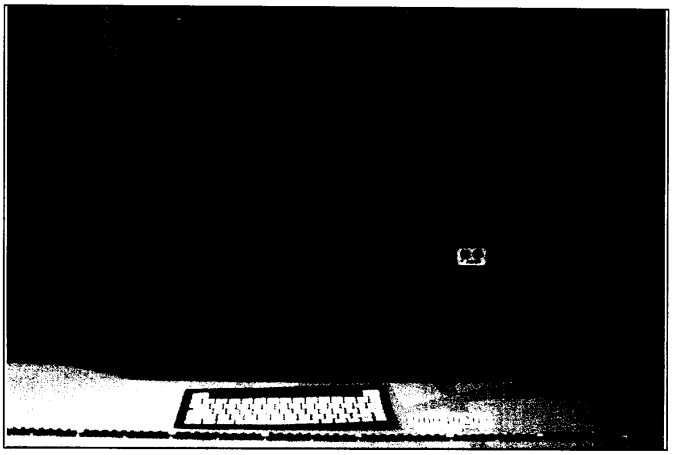

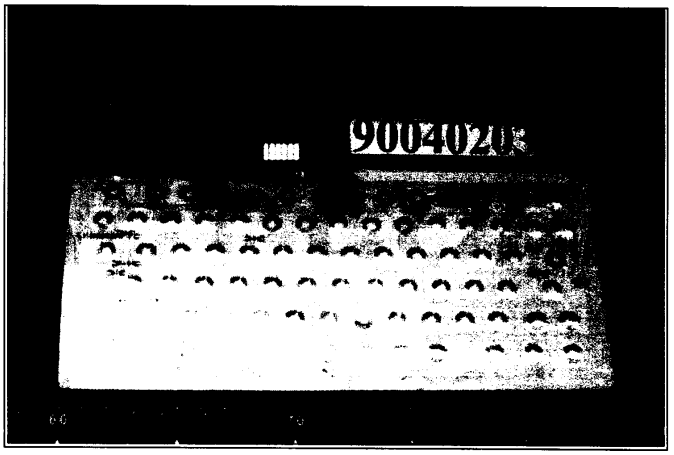
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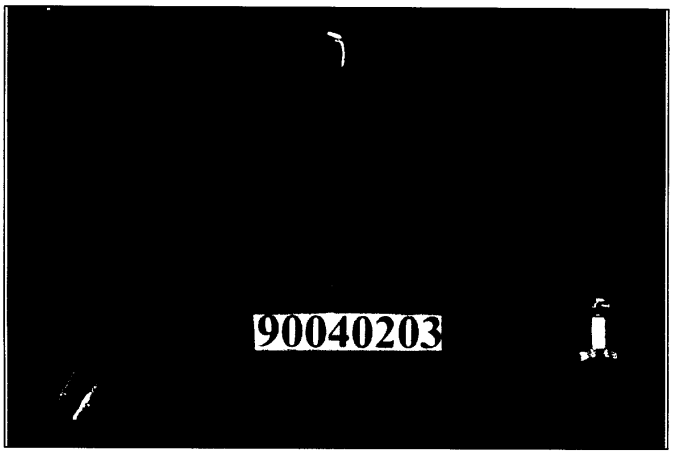
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