



# ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CLASS B CERTIFICATION

Test report file number : E041R-011

**Applicant** : SEONG IL DATA SYSTEMS CO., LTD.  
**Address** : 746-5, Seoil Bldg. 4F, Banpo-Dong, Seocho-Ku, Seoul, Korea  
**Manufacturer** : SEONG IL DATA SYSTEMS CO., LTD.  
**Address** : 746-5, Seoil Bldg. 4F, Banpo-Dong, Seocho-Ku, Seoul, Korea  
**Type of Equipment** : EXTERNAL HARD DISK DRIVE  
**FCC ID** : RRFSI100  
**Model Name** : SI-35  
**Multiple Model Name** : N/A  
**Serial Number** : N/A  
**Total page of Report** : 13 pages (including this page)  
**Date of Incoming** : December 04, 2003  
**Date of Issuing** : January 07, 2004

## SUMMARY

The equipment complies with the requirements of **FCC CFR 47 Part 15 Subpart B, Class B.**

This test report contains only the results of a single test of the sample supplied for the examination. It is not a general valid assessment of the features of the respective products of the mass-production.

Prepared by:   
Young-Min, Choi / Project Engineer  
EMC Div.  
ONETECH Corp.

Reviewed by:   
Gea-Won, Lee / Chief Engineer  
EMC Div.  
ONETECH Corp.



## CONTENTS

|                                                | Page |
|------------------------------------------------|------|
| 1. VERIFICATION OF COMPLIANCE.....             | 3    |
| 2. GENERAL INFORMATION.....                    | 4    |
| 2.1 PRODUCT DESCRIPTION .....                  | 4    |
| 2.2 MODEL DIFFERENCES: .....                   | 4    |
| 2.3 RELATED SUBMITTAL(S) / GRANT(S).....       | 4    |
| 2.4 TEST SYSTEM DETAILS.....                   | 4    |
| 2.5 TEST METHODOLOGY.....                      | 5    |
| 2.6 TEST FACILITY .....                        | 5    |
| 3. SYSTEM TEST CONFIGURATION.....              | 6    |
| 3.1 JUSTIFICATION .....                        | 6    |
| 3.2 EUT EXERCISE SOFTWARE.....                 | 6    |
| 3.3 CABLE DESCRIPTION.....                     | 6    |
| 3.4 NOISE SUPPRESSION PARTS ON CABLE .....     | 7    |
| 3.5 EQUIPMENT MODIFICATIONS.....               | 7    |
| 3.6 CONFIGURATION OF TEST SYSTEM.....          | 7    |
| 4. PRELIMINARY TEST .....                      | 8    |
| 4.1 AC POWER LINE CONDUCTED EMISSION TEST..... | 8    |
| 4.2 RADIATED EMISSION TEST .....               | 8    |
| 5. FINAL RESULT OF MEASUREMENT .....           | 9    |
| 5.1 CONDUCTED EMISSION TEST .....              | 9    |
| 5.2 RADIATED EMISSION TEST .....               | 11   |
| 6. FIELD STRENGTH CALCULATION .....            | 12   |
| 7. LIST OF TEST EQUIPMENT.....                 | 13   |

**1. VERIFICATION OF COMPLIANCE**

- APPLICANT : SEONG IL DATA SYSTEMS CO., LTD.  
- ADDRESS : 746-5, Seoil Bldg. 4F, Banpo-Dong, Seocho-Ku, Seoul, Korea  
- CONTACT PERSON : Mr. Chi-Hoon Oh / Manager  
- TELEPHONE NO : +82-2-516-0162  
- FCC ID : RRFSI100  
- MODEL NAME : SI-35  
- SERIAL NUMBER : N/A  
- DATE : January 07, 2004

|                                                      |                                                                        |
|------------------------------------------------------|------------------------------------------------------------------------|
| DEVICE TYPE                                          | Peripheral Device for Class B Personal Computer-Unintentional Radiator |
| E.U.T. DESCRIPTION                                   | EXTERNAL HARD DISK DRIVE                                               |
| THIS REPORT CONCERNS                                 | ORIGINAL GRANT                                                         |
| MEASUREMENT PROCEDURES                               | ANSI C63.4: 2001                                                       |
| TYPE OF EQUIPMENT TESTED                             | PRE-PRODUCTION                                                         |
| KIND OF EQUIPMENT AUTHORIZATION REQUESTED            | CERTIFICATION                                                          |
| EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)   | FCC PART 15, SECTION 15.101                                            |
| MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE | Yes                                                                    |
| FINAL TEST WAS CONDUCTED ON                          | 3 METER OPEN AREA TEST SITE                                            |

- This device has shown compliance with the conducted emissions limits in 15.107 adopted under FCC 02-107 (ET Docket 98-80). The device may be marketed after July 11, 2005 affected by the 15.37(j) transition provisions.
- The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.



## 2. GENERAL INFORMATION

### 2.1 Product Description

The SEONG IL DATA SYSTEMS CO., LTD., Model SI-35 (referred to as the EUT in this report) is an EXTERNAL HARD DISK DRIVE that is a personal computer peripheral with USB standard port. Product specification described herein was obtained from product data sheet or user's manual.

|                                                 |                           |
|-------------------------------------------------|---------------------------|
| CHASSIS TYPE                                    | Plastic                   |
| LIST OF EACH OSC. OR<br>CRY. FREQ.(FREQ.>=1MHz) | 24 MHz on Main Board      |
| POWER REQUIREMENTS                              | AC100-240V, 50/60Hz, 1.3W |
| NUMBER OF LAYERS                                | Main Board : 2 Layers     |
| EXTERNAL CONNECTOR                              | USB                       |

### 2.2 Model Differences:

The difference(s) compared to the EUT is as follows: None

### 2.3 Related Submittal(s) / Grant(s)

Original submittal only

### 2.4 Test System Details

The model numbers for all the equipments that were used in the tested system is:

| Model     | Manufacturer                       | FCC ID     | Description                       | Connected to |
|-----------|------------------------------------|------------|-----------------------------------|--------------|
| SI-35     | SEONG IL DATA SYSTEMS<br>CO., LTD. | RRFSI100   | EXTERNAL HARD DISK<br>DRIVE (EUT) | PC           |
| GX240     | Dell Computer Corp.                | DoC        | PC                                | -            |
| E551      | Dell Computer Corp.                | DoC        | MONITOR                           | PC           |
| SK-8110   | SILITEK                            | DoC        | KEYBOARD                          | PC           |
| X06-08477 | Microsoft Corp.                    | DoC        | MOUSE                             | PC           |
| 020-0470  | CARDINAL                           | GDE0196    | MODEM                             | PC           |
| 2225C     | HP                                 | DSI6XU2225 | PRINTER                           | PC           |



## 2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4: 2001. Radiated testing was performed at a distance of 3 meters from EUT to the antenna.

## 2.6 Test Facility

The open area test site and conducted measurement facilities are located on at 426-1 Daessangryung-Ri, Chowol-Myun, Kwangju-Kun, Kyunggi-Do 464-080 Korea. Description details of test facilities were submitted to the Commission on January 18, 2002. (Registration Number: 92819)



### 3. SYSTEM TEST CONFIGURATION

#### 3.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

| DEVICE TYPE | MANUFACTURER                    | MODEL/PART NUMBER | FCC ID |
|-------------|---------------------------------|-------------------|--------|
| Main Board  | SEONG IL DATA SYSTEMS CO., LTD. | -                 | N/A    |
| SMPS Board  | SEONG IL DATA SYSTEMS CO., LTD. | -                 | N/A    |

#### 3.2 EUT exercise Software

After connecting the EUT to a personal computer, data were continuously read and written from HDD of the Personal computer to the EUT.

#### 3.3 Cable Description

|                                | Power Cord<br>Shielded (Y/N) | I/O cable Shielded<br>(Y/N) | Length (M)      |
|--------------------------------|------------------------------|-----------------------------|-----------------|
| EXTERNAL HARD DISK DRIVE (EUT) | N                            | Y                           | 1.5(P), 1.2 (D) |
| PC                             | N                            | -                           | 1.5 (P)         |
| MONITOR                        | N                            | Y                           | 1.5 (P), 1.5(D) |
| KEYBOARD                       | N/A                          | N                           | 1.2(D)          |
| MOUSE                          | N/A                          | N                           | 1.2(D)          |
| MODEM                          | N                            | Y                           | 1.5(P), 1.5(D)  |
| PRINTER                        | N                            | Y                           | 1.5(P), 1.5(D)  |

\* The marked "(P)" means the Power Cable and "D" means the I/O Cable.

**3.4 Noise Suppression Parts on Cable**

|                                | <b>Ferrite Bead<br/>(Y/N)</b> | <b>Location</b> | <b>Metal Hood<br/>(Y/N)</b> | <b>Location</b> |
|--------------------------------|-------------------------------|-----------------|-----------------------------|-----------------|
| EXTERNAL HARD DISK DRIVE (EUT) | Y                             | EUT END(USB)    | Y                           | BOTH END        |
| PC                             | -                             | -               | -                           | -               |
| MONITOR                        | Y                             | PC END          | Y                           | PC END          |
| KEYBOARD                       | N                             | N/A             | Y                           | PC END          |
| MOUSE                          | N                             | N/A             | Y                           | PC END          |
| MODEM                          | N                             | N/A             | Y                           | BOTH END        |
| PRINTER                        | N                             | N/A             | Y                           | BOTH END        |

**3.5 Equipment Modifications**

To achieve compliance to CLASS B levels, the following change(s) was made by ONETECH Corp. during compliance testing:

- Added a 270pF bypass capacitor at pin no. 23, 25 of J4 (main board).
- Added a 820pF bypass capacitor at pin no. 1 of J4 (main board).
- Changed a capacitor from 0.33uF to 820pF at the C6 (main board).

**3.6 Configuration of Test System**

**Line Conducted Test** : The power cord of the EUT was connected to LISN. All supporting equipments were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.4: 2001 7.2.3 to determine the worse operating conditions.

**Radiated Emission Test** : Preliminary radiated emission test was conducted using the procedure in ANSI C63.4: 2001 8.3.1.1 to determine the worse operating conditions. Final radiated emission test was conducted at 3 meters open area test site.



#### 4. PRELIMINARY TEST

##### 4.1 AC Power line Conducted Emission Test

During Preliminary Test, the following operating mode was investigated

| Operation Mode                           | The Worse operating condition (Please check one only) |
|------------------------------------------|-------------------------------------------------------|
| Data were continuously read and written. | X                                                     |

##### 4.2 Radiated Emission Test

During Preliminary Test, the following operating mode was investigated

| Operation Mode                           | The Worse operating condition (Please check one only) |
|------------------------------------------|-------------------------------------------------------|
| Data were continuously read and written. | X                                                     |



## 5. FINAL RESULT OF MEASUREMENT

Preliminary test was done in normal operation mode. And the final measurement was selected for the maximized emission level

### 5.1 Conducted Emission Test

Humidity Level : 41 % Temperature: 18 °C  
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.107 (a)  
 Type of Test : CLASS B  
 Result : PASSED BY -4.23 dB at 2.06 MHz under peak detect mode

EUT : EXTERNAL HARD DISK DRIVE Date: December 20, 2003  
 Operating Condition : Data were continuously read and written.  
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

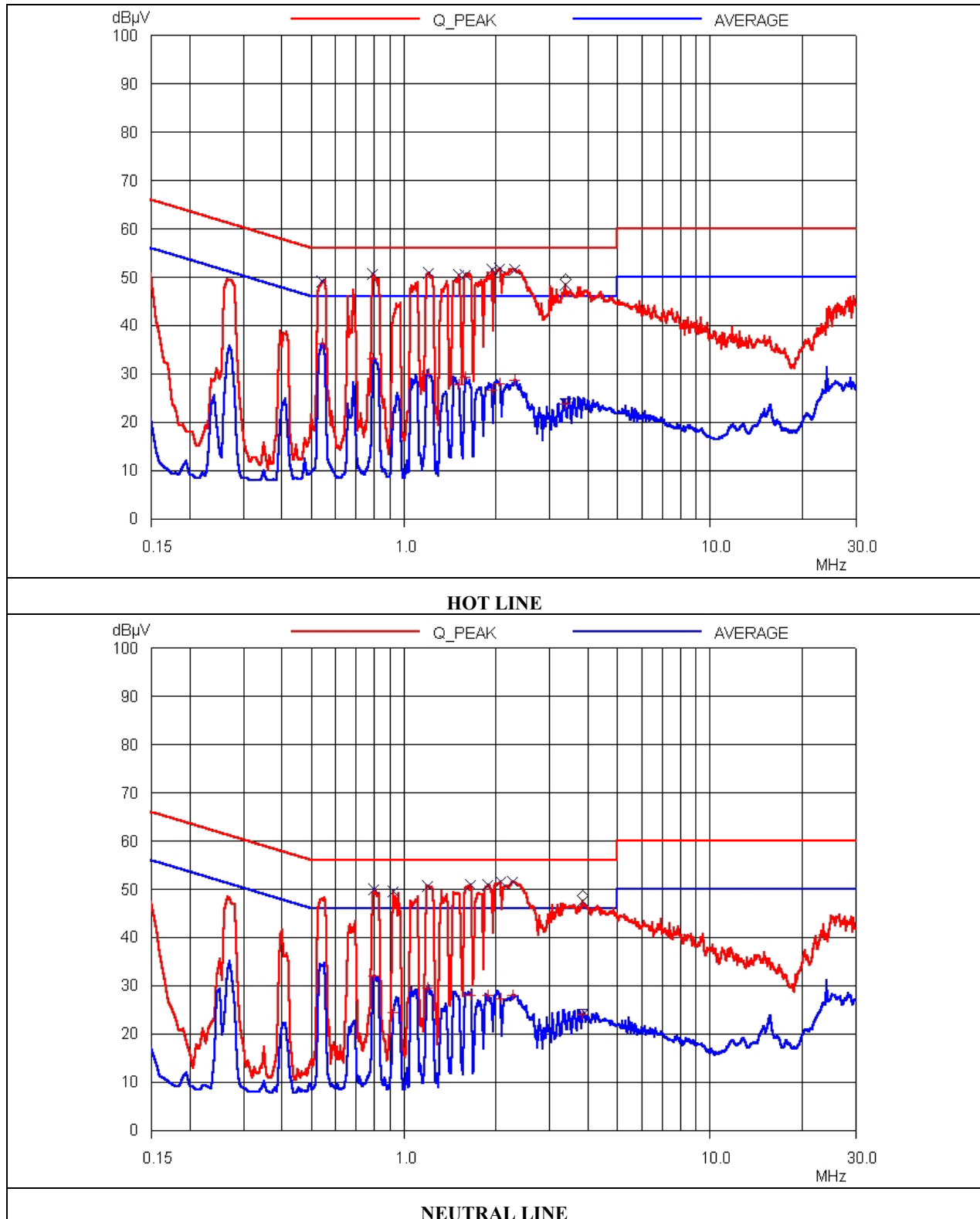
| Frequency<br>(MHz) | Line | Peak (dBuV)    |            | Margin<br>(dB) |
|--------------------|------|----------------|------------|----------------|
|                    |      | Emission level | Q.P Limits |                |
| 0.54               | H    | 49.06          | 56.00      | -6.94          |
| 0.80               | H    | 50.59          | 56.00      | -5.41          |
| 1.21               | H    | 50.79          | 56.00      | -5.21          |
| 1.66               | N    | 50.82          | 56.00      | -5.18          |
| 2.06               | H    | 51.77          | 56.00      | -4.23          |
| 2.25               | N    | 51.51          | 56.00      | -4.49          |
| 3.35               | H    | 48.52          | 56.00      | -7.48          |
| Frequency<br>(MHz) | Line | Average (dBuV) |            | Margin<br>(dB) |
|                    |      | Emission level | Limits     |                |
| 0.54               | H    | 36.17          | 46.00      | -9.83          |
| 0.80               | H    | 33.05          | 46.00      | -12.95         |

Line Conducted Emission Tabulated Data

Remark : "H": Hot Line, "N": Neutral line

See next page for an overview sweep performed with peak and average detector.

  
 Tested by: In-Sub, Youn / Test Engineer



It should not be reproduced except in full, without the written approval of ONETECH.

EMC-003 (Rev.0)

**HEAD OFFICE** : #505 SK APT. Factory 223-28, Sangdaewon 1 Dong, Jungwon-Gu, Seongnam-City, Kyunggi-Do, 462-121, Korea  
(TEL: +82-31-746-8500, FAX: +82-31-746-8700)

**EMC Testing Dept** : 426-1 Daessangryung-Ri, Chowol-Myun, Kwangju-City, Kyunggi-Do 464-860 Korea. (TEL: +82-31-765-8289, FAX: +82-31-766-2904)

**5.2 Radiated Emission Test**

The following table shows the highest levels of radiated emission on both polarizations of horizontal and vertical.

Humidity Level : 51 % Temperature: 12 °C  
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109 (a)  
 Type of Test : CLASS B  
 Result : PASSED BY -4.96 dB at 132.80 MHz

EUT : EXTERNAL HARD DISK DRIVE Date: December 19, 2003  
 Operating Condition : Data were continuously read and written.  
 Frequency range : 30MHz – 1000MHz  
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)  
 Distance : 3 Meter

| Radiated Emissions |                | Ant  | Correction Factors |               | Total            | FCC CLASS B       |                |
|--------------------|----------------|------|--------------------|---------------|------------------|-------------------|----------------|
| Freq.<br>(MHz)     | Amp.<br>(dBuV) | Pol. | Ant.<br>(dBuV/m)   | Cable<br>(dB) | Amp.<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
| 72.00              | 25.90          | V    | 7.39               | 1.00          | 34.29            | 40.00             | -5.71          |
| 105.60             | 22.60          | V    | 12.61              | 1.17          | 36.38            | 43.50             | -7.12          |
| 132.80             | 24.40          | V    | 12.86              | 1.28          | 38.54            | 43.50             | -4.96          |
| 165.60             | 16.90          | V    | 15.72              | 1.41          | 34.03            | 43.50             | -9.47          |
| 233.40             | 20.30          | V    | 11.32              | 1.74          | 33.36            | 46.00             | -12.64         |
| 299.40             | 15.00          | H    | 15.06              | 2.00          | 32.06            | 46.00             | -13.94         |
| 670.60             | 9.20           | H    | 20.62              | 3.16          | 32.98            | 46.00             | -13.02         |
| 737.40             | 15.00          | V    | 20.71              | 3.48          | 39.19            | 46.00             | -6.81          |
| 933.20             | 9.90           | V    | 22.89              | 4.05          | 36.84            | 46.00             | -9.16          |

Radiated Emissions Tabulated Data

  
 Tested by: In-Sub, Youn / Test Engineer



## 6. FIELD STRENGTH CALCULATION

Meter readings are compared to the specification limit correcting for antenna and cable losses

+ Meter reading (dBuV)

+ Cable Loss (dB)

+ Antenna Factor (Loss) (dB/meter)

---

= Corrected Reading (dBuV/meter)

- Specification Limit (dBuV/meter)

= dB Relative to Spec (+/- dB)

**7. LIST OF TEST EQUIPMENT**

| No. | EQUIPMENTS               | MFR.        | MODEL       | SER. NO.     | LAST CAL | DUE CAL | USE |
|-----|--------------------------|-------------|-------------|--------------|----------|---------|-----|
| 1.  | Test receiver            | R/S         | ESVS 10     | 827864/005   | DEC/03   | 12MONTH | ■   |
| 2.  | Test receiver            | R/S         | ESHS 10     | 834467/007   | APR/03   | 12MONTH | ■   |
| 3.  | Spectrum analyzer        | HP          | 8566B       | 3407A08547   | MAY/03   | 12MONTH |     |
| 4.  | Spectrum analyzer        | HP          | 8568B       | 3109A05456   | MAY/03   | 12MONTH | ■   |
| 5.  | RF preselector           | HP          | 85685A      | 3107A01264   | MAY/03   | 12MONTH | ■   |
| 6.  | Quasi-Peak Adapter       | HP          | 85650A      | 3107A01542   | MAY/03   | 12MONTH | ■   |
| 7.  | TRILOG Broadband Antenna | Schwarzbeck | VULB9163    | VULB9163 166 | FEB/03   | 12MONTH |     |
| 8.  | Biconical antenna        | EMCO        | 3104C       | 9109-4443    | MAY/03   | 12MONTH | ■   |
|     |                          |             |             | 9109-4444    | JUL/03   | 12MONTH |     |
|     |                          | Schwarzbeck | VHA9103     | 91031852     | AUG/02   | 12MONTH |     |
| 9.  | Log Periodic antenna     | EMCO        | 3146        | 9109-3213    | AUG/02   | 12MONTH |     |
|     |                          |             |             | 9109-3214    | JUL/03   | 12MONTH | ■   |
|     |                          |             |             | 9109-3217    | MAY/03   | 12MONTH |     |
|     |                          | Schwarzbeck | 9108-A(494) | 62281001     | AUG/02   | 12MONTH |     |
| 10. | LISN                     | EMCO        | 3825/2      | 9109-1867    | AUG/03   | 12MONTH | ■   |
|     |                          |             |             | 9109-1869    | OCT/03   | 12MONTH | ■   |
| 11. | Position Controller      | EMCO        | 1090        | 9107-1038    | N/A      | N/A     | ■   |
| 12. | Turn Table               | EMCO        | 1080-1.21   | 9109-1576    | N/A      | N/A     | ■   |
| 13. | Antenna Master           | EMCO        | 1070-1      | 9109-1624    | N/A      | N/A     | ■   |