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## **REPORT ON**

Limited FCC CFR 47: Part 15 Testing in support of an Application for Grant of Equipment  
Authorisation of a Symbol MC9060 Mobile Computer  
FCC ID: H9PMC9060B

Report No OR611522/02 Issue 3

January 2004

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FCC CFR 47: Part 15 Testing in support of an Application for  
Grant of Equipment Authorisation of a Symbol MC9060 Mobile  
Computer

FCC ID: H9PMC9060B

Report No OR611522/02 Issue 3

January 2004

**PREPARED FOR**

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**DATED**

**21-01-04**

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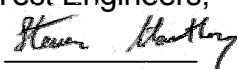
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(Including Annex A)

**ENGINEERING STATEMENT**

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47: Part 15. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineers;

  
\_\_\_\_\_  
S Hartley

  
\_\_\_\_\_  
A Guy

  
\_\_\_\_\_  
G Lawler



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## **STATUS**

|                                           |                                                                                                                                                                                                                       |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OBJECTIVE                                 | To undertake measurements to determine the Equipment Under Test's (EUT's) compliance with the specification.                                                                                                          |
| MANUFACTURING DESCRIPTION                 | MC9060 Mobile Computer                                                                                                                                                                                                |
| APPLICANT                                 | Symbol Technologies Inc<br>One Symbol Plaza<br>Holtsville<br>NY 11742-1300<br>New York<br>United States of America                                                                                                    |
| MANUFACTURERS TYPE NUMBER                 | MC9060                                                                                                                                                                                                                |
| MANUFACTURERS PART NUMBER                 | MC9060-SKOH9AEA715                                                                                                                                                                                                    |
| SERIAL NUMBER                             | BETAA01172<br>BETAA01163                                                                                                                                                                                              |
| HARDWARE VERSION                          | Rev 11                                                                                                                                                                                                                |
| DECLARED VARIANTS                         | None                                                                                                                                                                                                                  |
| TEST SPECIFICATION NUMBER                 | FCC CFR 47: Part 15 Subpart C, August 2002                                                                                                                                                                            |
| REGISTRATION NUMBER                       | OR611522                                                                                                                                                                                                              |
| QUANTITY OF ITEMS TESTED                  | One                                                                                                                                                                                                                   |
| SECURITY CLASSIFICATION OF EUT            | Unclassified                                                                                                                                                                                                          |
| INCOMING RELEASE<br>SERIAL NUMBER<br>DATE | Declaration of Build Status<br>OR611522                                                                                                                                                                               |
| DISPOSAL<br>REFERENCE NUMBER<br>DATE      | Held pending disposal<br>N/A<br>N/A                                                                                                                                                                                   |
| START OF TEST<br>FINISH OF TEST           | 17 <sup>th</sup> November 2003<br>19 <sup>th</sup> January 2004                                                                                                                                                       |
| TEST ENGINEERS                            | A Guy<br>S Hartley<br>G Lawler                                                                                                                                                                                        |
| RELATED DOCUMENTS                         | ANSI C63.4 2001. Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz.<br>FCC Public Notice document (DA 00-705 released 30 March 2000) |



## TEST RATIONALE

This report has been re-issued as Issue 3, the original report carried the incorrect frequencies for Channel 1, 6 and 11 on page 13 these have now been replaced with the correct Channel frequencies. This report is intended to replace the original report OR611522/02/Issue 2 issued in January 2004.

The information contained within this report is intended to show verification of compliance of the Symbol Technologies Inc MC9060 Mobile Computer to the requirements of FCC Specification Part 15.

Testing was carried out in support of an application for Grant of Equipment Authorisation in the name of Symbol Technologies Inc.

FCC ID H9PMC9060B

The unit supplied for testing was a MC9060 Mobile Computer, which offers 2.4GHz 802.11b Wireless LAN and Bluetooth connectivity.

For results of other tests, refer to the original TÜVPS test report OR611514/01 Issue 3.

The terminal utilizes the approved Symbol Main Terminal Module (MTM) with embedded 802.11b RLAN radio and the Symbol Bluetooth Module. FCC ID numbers are detailed below:

| <u>Type:</u> | <u>Description</u>      | <u>Approval</u> | <u>FCC ID</u> | <u>Date</u> |
|--------------|-------------------------|-----------------|---------------|-------------|
| 21-64436     | Main Terminal Module    | FCC Part15      | H9P2164436    | 26/11/2003  |
| 21-64381     | Symbol Bluetooth Module | FCC Part15      | H9P2164381    | 11/2003     |

The radios integrated in this terminal are not designed to operate simultaneously and are therefore tested independently.

Sub-equipped version (RLAN only)

A sub-equipped version of the MC9060 is also available; this version will only offer 802.11b RLAN connectivity, as the Bluetooth module is not included.

Section 3 of the report details testing carried out in accordance with:

- FCC: Part 15.109, Spurious Radiated Emissions
- FCC: Part 15.205, 15.209, Measurement at Band Edge (Marker Delta Method)
- FCC: Part 15.247(b)(3), Maximum Peak Output Power
- FCC: Part 15.247(c), Spurious Radiated Emissions

Testing was performed on two separate samples;

- Serial No BETAA01172 was used for
  - FCC: Part 15.109, Spurious Radiated Emissions
  - FCC: Part 15.205, 15.209, Measurement at Band Edge (Marker Delta Method)
  - FCC: Part 15.247(c), Spurious Radiated Emissions
- Serial No BETAA01163 was used for
  - FCC: Part 15.247(b)(3), Maximum Peak Output Power

### Location Of Testing

BABT Engineers, Steve Hartley, Tony Guy and Graeme Lawler, conducted all testing at the premises BABT, Segensworth Road, Fareham, Hampshire, PO15 5RH. A complete site description is on file with the FCC Laboratory Division, Registration Number: 90987. See Annex A.



## **SYSTEM CONFIGURATION DURING EMC TESTING**

The EUT was set-up simulating a typical user installation on the Alternative Open Field Test Site identified in Annex A, and tested in accordance with the specification.

For all tests, the Symbol MC9060 Mobile Computer was powered by its own internal battery and fitted with a Symbol Headset.

The test software in the EUT enabled the Test Engineer to select full power and continuous transmit on the following channels;

### **2.4GHz RLAN functionality**

Channel 1: 2412MHz  
Channel 6: 2437MHz  
Channel 11: 2462MHz

### **2.4GHz Bluetooth functionality**

Channel 2: 2402MHz  
Channel 41: 2441MHz  
Channel 80: 2480MHz

### **TEST SET UP PHOTOGRAPH**

The photograph below shows the EUT configuration during Radiated Emission testing.



Photograph 1



## **EQUIPMENT INFORMATION**

### Equipment under Test (EUT):

|                          |                          |                         |
|--------------------------|--------------------------|-------------------------|
| <b>Equipment:</b>        | <b>Mobile Computer</b>   | <b>Headset</b>          |
| <b>Manufacturer:</b>     | Symbol Technologies Inc  | Symbol Technologies Inc |
| <b>Type No:</b>          | MC9060                   | VXI 61-SYB              |
| <b>Part No.</b>          | MC9060-SK0H9AEA715       | 50-11300-050            |
| <b>Serial No:</b>        | BETAA01172<br>BETAA01163 | Not Serialised          |
| <b>Drawing Revision:</b> | Rev 11                   | Rev A                   |

The unit used for the internal photographs in this report was not the EUT, but was supplied as an identical unit for photographs only. It is declared as being the same build status as the EUT.

### Test Equipment and Ancillaries Used For Test

| <b>Instrument</b>                 | <b>Manufacturer</b>    | <b>Type No.</b>      | <b>EMC No.</b> |
|-----------------------------------|------------------------|----------------------|----------------|
| Room 5                            | Siemens and Matsushita | ----                 | 2533           |
| ESIB Receiver                     | Rohde & Schwarz        | ESIB 40              | 2972           |
| EMI Receiver                      | Hewlett Packard        | 8542E                | 2286           |
| Bilog Antenna                     | Chase                  | CBL 6143             | 2860           |
| Turntable & Controller            | HD                     | HD 050               | 2528           |
| Antenna Mast                      | EMCO                   | 2070                 | ----           |
| Antenna Mast Controller           | EMCO                   | 2090                 | ----           |
| Test Receiver                     | Rohde & Schwarz        | ESIB 40              | 2917           |
| Signal Generator                  | Hewlett Packard        | 8672A                | 411            |
| Signal Generator                  | Hewlett Packard        | 8673B                | 953            |
| High Pass Filter                  | RLC Electronics        | F-100-3000-5-R       | 4467           |
| Low Noise Amplifier (1GHz-8GHz)   | Miteq                  | AMF-3D-001080-18-13P | 2457           |
| Horn                              | EMCO                   | 3115                 | 2297           |
| Horn                              | EMCO                   | 3155                 | 2397           |
| Horn                              | Advanced Microtek      | AM180 HA-K-TU2       | 2945           |
| Low Noise Amplifier (8GHz-18GHz)  | Avantek                | AWT-18036            | 1081           |
| Low Noise Amplifier (18GHz-26GHz) | Avantek                | AMT-26177-33         | 2072           |
| Barometer                         | diplex                 | ----                 | 1938           |
| Peak Power Analyser               | Hewlett Packard        | 8990A                | 1670           |
| Peak Power Sensor                 | Hewlett Packard        | 84812A               | 1662           |
| Hygrometer                        | Rotronic               | A1                   | 3155           |
| Hygrometer                        | Rotronic               | A1                   | Inv 4066       |

Table of Instrumentation Used for Testing

### Note(s)

- 1) All items are calibrated annually, except where labelled TU (Traceability Unscheduled). These items are calibrated within the test configurations using calibrated equipment from the tables above.





**TEST RESULTS  
RLAN MODE**



## **MEASUREMENT AT THE BAND EDGE (Marker Delta Method)**

### **TEST PROCEDURE**

Testing to the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.205, for Restricted Bands of Operation was carried out on the Measurement Test Facility detailed in Annex A.  
The following Test Results were obtained using the FCC Public Notice document (DA 00-705 released 30 March 2000) for making measurements at the Band Edge, incorporating the 'Marker Delta Method'.

### **TEST RESULTS**

The EUT met the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.205 for Band Edge Measurements.

#### **Step 1**

Bottom Channel Fundamental Field Strength Measurement.

Peak measurements performed utilising a Resolution Bandwidth and Video Bandwidth of 1MHz.  
Average measurements performed utilising a Resolution Bandwidth of 1MHz and Video Bandwidth of 10Hz.

| Freq | Ant Pol | Hgt | Azi | Peak Field Strength | Average Field Strength |
|------|---------|-----|-----|---------------------|------------------------|
| MHz  | H/V     | cm  | deg | dB $\mu$ V/m        | dB $\mu$ V/m           |
| 2412 | V       | 108 | 216 | 108.6               | 100.5                  |

Table of Results for Measurement at the Band Edge

#### **Step 2**

Determine Marker delta amplitude between 2412MHz fundamental and 2390MHz the Band Edge under investigation.

Using a span of 30MHz with Resolution Bandwidth and Video Bandwidth of 300kHz.

Marker Delta Amplitude = 60.7dB

#### **Step 3**

By subtracting the Marker Delta obtained from Step 2 from the 2412MHz Field Strength measurement from Step 1, gives following Result

Peak of 47.9dB $\mu$ V/m (Limit is 74.0dB $\mu$ V/m)

Average of 39.8dB $\mu$ V/m (Limit is 54.0dB $\mu$ V/m)

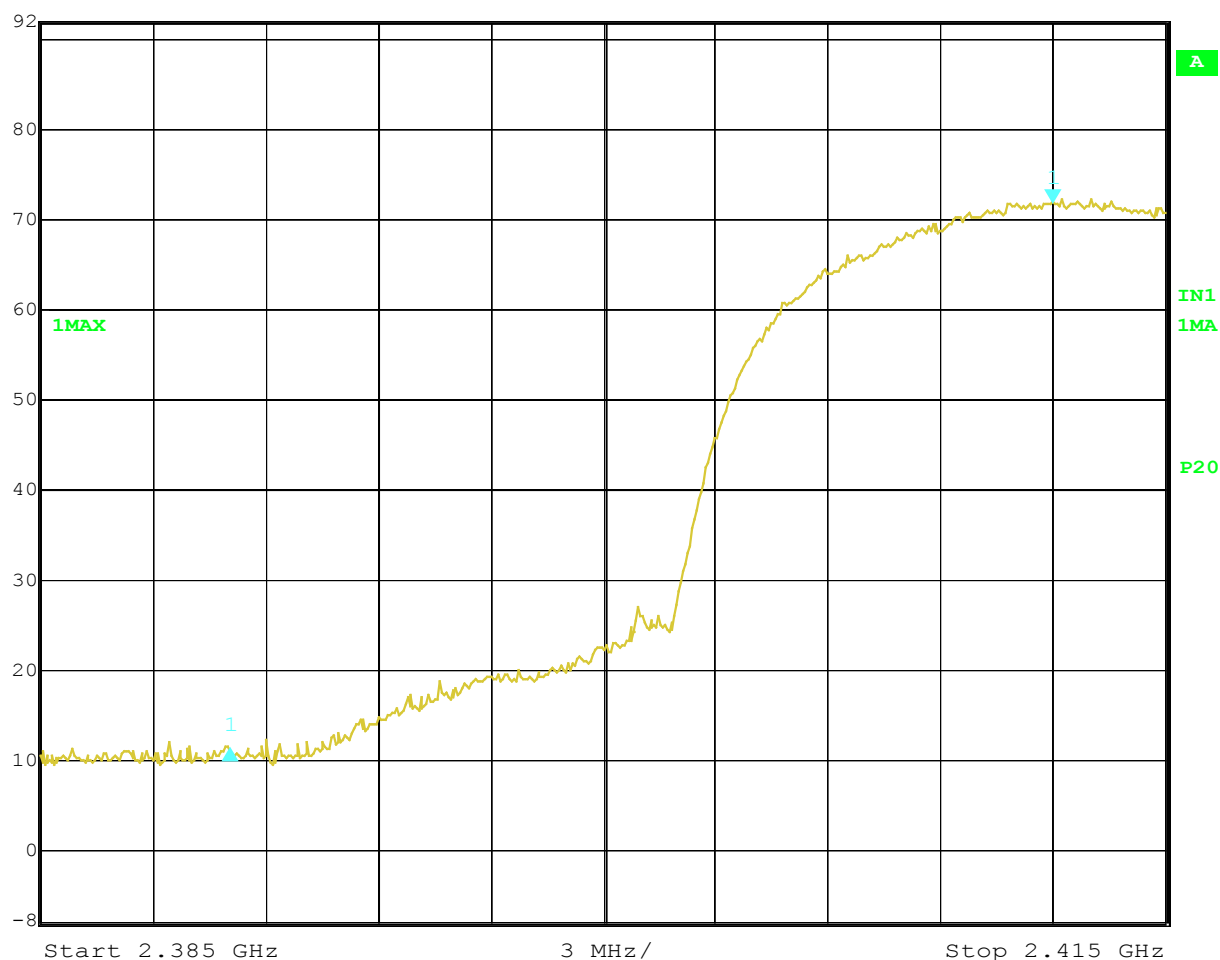


## MEASUREMENT AT THE BAND EDGE (Marker Delta Method) - continued

### TEST RESULTS - continued

Plot for Bottom Channel 2412MHz

|  |             |                  |     |         |        |      |
|--|-------------|------------------|-----|---------|--------|------|
|  | Max/Ref Lvl | Delta 1 [T1]     | RBW | 300 kHz | RF Att | 0 dB |
|  | 92 dBμV     | -60.75 dB        | VBW | 300 kHz |        |      |
|  | 72 dBμV     | -21.94989980 MHz | SWT | 5 ms    | Unit   | dBμV |



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## **MEASUREMENT AT THE BAND EDGE (Marker Delta Method) - continued**

### **TEST RESULTS - continued**

#### **Step 1**

Top Channel Fundamental Field Strength Measurement.

Peak measurements performed utilising a Resolution Bandwidth and Video Bandwidth of 1MHz.

Average measurements performed utilising a Resolution Bandwidth of 1MHz and Video Bandwidth of 10Hz.

| Freq | Ant Pol | Hgt | Azi | Peak FS | Average FS |
|------|---------|-----|-----|---------|------------|
| GHz  | H/V     | cm  | deg | dBµV/m  | dBµV/m     |
| 2462 | V       | 106 | 215 | 110.9   | 102.8      |

Table of Results for Measurements at the Band Edge

#### **Step 2**

Determine Marker delta amplitude between 2462MHz fundamental and 2483.5MHz the Band Edge under investigation.

Using a span of 30MHz with Resolution Bandwidth and Video Bandwidth of 300kHz.

Marker Delta Amplitude 59.9dB

#### **Step 3**

By subtracting the Marker Delta obtained from Step 2 from the 2483.5MHz Field Strength measurement from Step 1, gives following Result

Peak of 51.0dBµV/m (Limit is 74.0dBµV/m)

Average of 42.9dBµV/m (Limit is 54.0dBµV/m)

Procedure: Test Performed in accordance with FCC Public Notice document (DA 00-705 released 30 March 2000)

Performed by: G Lawler, EMC Engineer.

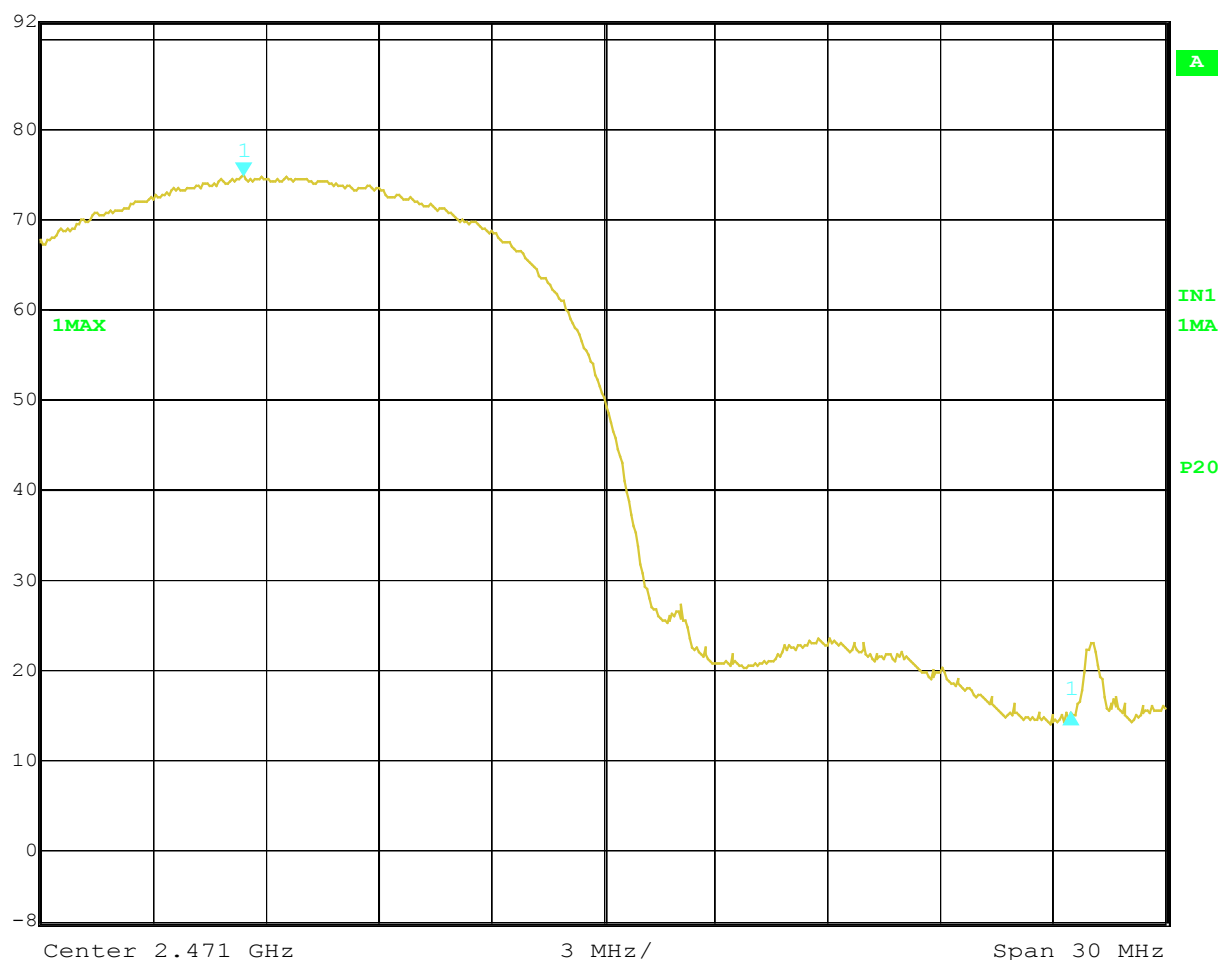


## MEASUREMENT AT THE BAND EDGE (Marker Delta Method) - continued

### TEST RESULTS - continued

Plot for Top Channel 2462MHz

|  |             |                 |     |         |        |      |
|--|-------------|-----------------|-----|---------|--------|------|
|  | Max/Ref Lvl | Delta 1 [T1]    | RBW | 300 kHz | RF Att | 0 dB |
|  | 92 dBμV     | -59.92 dB       | VBW | 300 kHz |        |      |
|  | 72 dBμV     | 22.08917836 MHz | SWT | 5 ms    | Unit   | dBμV |



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## **MAXIMUM PEAK OUTPUT POWER (EIRP Method)**

### **TEST PROCEDURE**

Testing to the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.247(b)(1), for Maximum Peak Output Power was carried out.

The EUT contains an integral antenna and therefore the Maximum Peak Output Power measurement was made using the EIRP method.

The Spectrum Analyser was tuned to the test frequency. The device Output Power setting was controlled as specified in the System Configuration Section 1 of this document. The device was then rotated through 360 degrees until the highest power level was observed in both planes of polarisation. The device was then replaced with a substitution antenna, the signal to the antenna was adjusted to equal the related level detected from the device.

Maximum Peak Output Power measurements were made with the EUT set to continuous transmit at maximum power on the following channels:

2412MHz  
2437MHz  
2462MHz

### **TEST RESULTS**

The EUT met the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.247(b)(1) for Maximum Peak Output Power.

| Frequency<br>(MHz) | Result EIRP<br>(dBm) | Result EIRP<br>(mW) |
|--------------------|----------------------|---------------------|
| 2412               | 13.4                 | 21.9                |
| 2437               | 14.3                 | 26.9                |
| 2462               | 16.6                 | 45.7                |
| Limit              | < +36dBm or < 4W     |                     |

Table of Results for Maximum Peak Output Power

Procedure: Test Performed in accordance with FCC CFR 47: Part 15.247(b)(1) for Maximum Peak Output Power.

Performed by: G Lawler, EMC Engineer.



## **SPURIOUS RADIATED EMISSIONS**

### **TEST PROCEDURE**

Testing to the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.247(c), for Radiated Emissions was carried out on the Measurement Test Facility detailed in Annex A. Section 15.247(c) also requires Sections 15.205 and 15.209 to be applied.

A preliminary profile of the Radiated Emissions was obtained by operating the Equipment Under Test (EUT) on a remotely controlled turntable within a semi-anechoic chamber; measurements were taken at a 3m distance unless otherwise stated. Measurements of emissions from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations. The profiling produced a list of the worst-case emissions together with the EUT azimuth and antenna polarisation.

Using the information from the preliminary profiling of the EUT, a search was made in the frequency range 30MHz to 25GHz. The list of worst-case emissions was then confirmed or updated under Open Site conditions. Emission levels were maximised by adjusting the antenna height, antenna polarisation and turntable azimuth.

30MHz - 1GHz emissions levels were then formally measured a CISPR Quasi-Peak detector.  
1GHz - 25GHz emissions levels were then formally measured a Peak and Average detectors.  
(Note: Peak measurements performed using a Resolution and Video Bandwidth of 1MHz, Average measurements performed using a Resolution Bandwidth of 1MHz and a Video Bandwidth of 10Hz)

The EUT was operating off its internal battery, the battery was replaced at regular intervals to ensure optimum performance of the EUT.

Measurements were made with the EUT transmitting on the following channels.

2412MHz  
2437MHz  
2462MHz

Radiated Emissions from 30MHz to 1GHz were made using a HP 8542E Test Receiver.

Radiated Emissions from 1GHz to 25GHz were made using a Rhode and Schwarz ESIB 40 Test Receiver.

The measurements were performed at a 3m distance unless otherwise stated.



## **SPURIOUS RADIATED EMISSIONS - continued**

### **TEST RESULTS**

#### **30MHz - 1GHz Frequency Range**

Equipment Designation: Intentional Radiator.

The EUT met the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.247(c), 15.205 and 15.209 for Radiated Emissions (30MHz – 1GHz).

#### **EUT Tx on Bottom Channel (2412MHz)**

30MHz – 1GHz Alternative Open Area Test Site Results: The levels of the 6 highest emissions measured in accordance with the specification are presented below: -

| Emission Frequency | Pol | Hgt | Azm | Field Strength at 3m |      | Specification Limit |       |
|--------------------|-----|-----|-----|----------------------|------|---------------------|-------|
| MHz                | H/V | cm  | deg | dBμV/m               | μV/m | dBμV/m              | μV/m  |
| 189.7              | V   | 100 | 37  | 22.5                 | 13.3 | 43.5                | 150.0 |
| 195.9              | V   | 100 | 280 | 21.9                 | 12.4 | 43.5                | 150.0 |
| 527.2              | V   | 100 | 240 | 32.5                 | 42.2 | 46.0                | 200.0 |
| 575.0              | V   | 100 | 240 | 30.3                 | 32.7 | 46.0                | 200.0 |
| 623.1              | H   | 125 | 178 | 35.2                 | 57.5 | 46.0                | 200.0 |
| 748.0              | H   | 108 | 221 | 33.0                 | 44.7 | 46.0                | 200.0 |

Table of Results for Spurious Radiated Emissions

#### **EUT Tx on Middle Channel (2437MHz)**

30MHz – 1GHz Alternative Open Area Test Site Results: The levels of the 6 highest emissions measured in accordance with the specification are presented below: -

| Emission Frequency | Pol | Hgt | Azm | Field Strength at 3m |      | Specification Limit |       |
|--------------------|-----|-----|-----|----------------------|------|---------------------|-------|
| MHz                | H/V | cm  | deg | dBμV/m               | μV/m | dBμV/m              | μV/m  |
| 189.7              | V   | 100 | 71  | 22.3                 | 13.0 | 43.5                | 150.0 |
| 195.8              | V   | 100 | 263 | 22.0                 | 12.6 | 43.5                | 150.0 |
| 527.0              | V   | 107 | 274 | 33.1                 | 45.2 | 46.0                | 200.0 |
| 575.0              | V   | 100 | 263 | 32.2                 | 40.7 | 46.0                | 200.0 |
| 623.1              | H   | 130 | 194 | 33.7                 | 48.4 | 46.0                | 200.0 |
| 747.8              | H   | 100 | 229 | 34.1                 | 50.1 | 46.0                | 200.0 |

Table of Results for Spurious Radiated Emissions





## **SPURIOUS RADIATED EMISSIONS - continued**

### **TEST RESULTS - continued**

#### **30MHz - 1GHz Frequency Range**

##### **EUT Tx on Top Channel (2462MHz)**

30MHz – 1GHz Alternative Open Area Test Site Results: The levels of the 6 highest emissions measured in accordance with the specification are presented below: -

| Emission Frequency | Pol | Hgt | Azm | Field Strength at 3m |      | Specification Limit |       |
|--------------------|-----|-----|-----|----------------------|------|---------------------|-------|
|                    |     |     |     | dBµV/m               | µV/m | DBµV/m              | µV/m  |
| 189.3              | V   | 100 | 55  | 22.5                 | 13.3 | 43.5                | 150.0 |
| 195.4              | V   | 100 | 281 | 22.5                 | 13.3 | 43.5                | 150.0 |
| 527.4              | V   | 100 | 259 | 32.4                 | 41.7 | 46.0                | 200.0 |
| 574.8              | V   | 100 | 259 | 33.4                 | 46.8 | 46.0                | 200.0 |
| 623.2              | H   | 147 | 200 | 32.6                 | 42.7 | 46.0                | 200.0 |
| 747.5              | H   | 100 | 215 | 33.6                 | 47.9 | 46.0                | 200.0 |

Table of Results for Spurious Radiated Emissions

#### **ABBREVIATIONS FOR ABOVE TABLES**

H      Horizontal Polarisation  
Pol     Polarisation  
deg    degree

V      Vertical Polarisation  
Hgt    Height  
Azm    Azimuth

Procedure:                      Test Performed in accordance with ANSI C63.4.

Performed by:                A Guy, EMC Engineers.



## **SPURIOUS RADIATED EMISSIONS - continued**

### **TEST RESULTS - continued**

#### **1GHz - 25GHz Range**

Equipment Designation: Intentional Radiator.

The EUT met the requirements of FCC CFR 47: Part 15.247(c), 15.205 and 15.209 for Spurious Radiated Emissions (1GHz – 25GHz).

#### **EUT Tx on Bottom Channel (2412MHz)**

Note: measurement of the carrier frequency (2412MHz) produced a Field Strength of 102.9dB $\mu$ V/m. Therefore the specification limit for any spurious emissions found outside of the Restricted Band table (Section 15.205) is 82.9dB $\mu$ V/m (carrier level minus 20dB)

| Frequency | Antenna      |        | Turntable | Peak Field Strength | Peak Limit   | Average* Field Strength | Average Limit |
|-----------|--------------|--------|-----------|---------------------|--------------|-------------------------|---------------|
|           | Polarisation | Height | Azimuth   |                     |              |                         |               |
| GHz       | H/V          | cm     | deg       | dB $\mu$ V/m        | dB $\mu$ V/m | dB $\mu$ V/m            | dB $\mu$ V/m  |
| 1.094     | V            | 173    | 360       | 50.3                | 74.0         | 33.7                    | 54.0          |
| 4.076     | V            | 114    | 278       | 55.5                | 74.0         | 52.4                    | 54.0          |
| 4.822     | H            | 100    | 253       | 52.2                | 74.0         | 38.3                    | 54.0          |
| 8.152     | H            | 100    | 258       | 54.2                | 74.0         | 45.6                    | 54.0          |

Table of Results for Spurious Radiated Emissions

#### **EUT Tx on Middle Channel (2437MHz)**

Note: measurement of the carrier frequency (2437MHz) produced a Field Strength of 102.5dB $\mu$ V/m. Therefore the specification limit for any spurious emissions found outside of the Restricted Band table (Section 15.205) is 82.5dB $\mu$ V/m (carrier level minus 20dB)

| Frequency | Antenna      |        | Turntable | Peak Field Strength | Peak Limit   | Average* Field Strength | Average Limit |
|-----------|--------------|--------|-----------|---------------------|--------------|-------------------------|---------------|
|           | Polarisation | Height | Azimuth   |                     |              |                         |               |
| GHz       | H/V          | cm     | deg       | dB $\mu$ V/m        | dB $\mu$ V/m | dB $\mu$ V/m            | dB $\mu$ V/m  |
| 2.494     | V            | 100    | 274       | 55.3                | 74.0         | 45.2                    | 54.0          |
| 4.126     | V            | 116    | 232       | 56.5                | 74.0         | 52.9                    | 54.0          |
| 4.874     | H            | 100    | 260       | 48.9                | 74.0         | 36.0                    | 54.0          |
| 8.252     | H            | 111    | 238       | 54.1                | 74.0         | 46.8                    | 54.0          |

Table of Results for Radiated Emissions



## **SPURIOUS RADIATED EMISSIONS - continued**

### **TEST RESULTS**

#### **1GHz - 25GHz Range**

##### **EUT Tx on Top Channel (2462MHz)**

Note: measurement of the carrier frequency (2462MHz) produced a Field Strength of 104.8dB $\mu$ V/m. Therefore the specification limit for any spurious emissions found outside of the Restricted Band table (Section 15.205) is 84.8dB $\mu$ V/m (carrier level minus 20dB)

| Frequency | Antenna      |        | Turntable | Peak Field Strength | Peak Limit   | Average* Field Strength | Average Limit |
|-----------|--------------|--------|-----------|---------------------|--------------|-------------------------|---------------|
|           | Polarisation | Height | Azimuth   |                     |              |                         |               |
| GHz       | H/V          | cm     | deg       | dB $\mu$ V/m        | dB $\mu$ V/m | dB $\mu$ V/m            | dB $\mu$ V/m  |
| 2.484     | V            | 107    | 213       | 58.2                | 74.0         | 53.2                    | 54.0          |
| 2.499     | V            | 128    | 215       | 52.6                | 74.0         | 41.2                    | 54.0          |
| 4.176     | V            | 101    | 246       | 54.7                | 74.0         | 51.2                    | 54.0          |
| 4.924     | H            | 100    | 274       | 52.1                | 74.0         | 38.7                    | 54.0          |
| 8.352     | H            | 114    | 220       | 53.8                | 74.0         | 47.1                    | 54.0          |

Table of Results for Spurious Radiated Emissions

Procedure: Test Performed in accordance with ANSI C63.4.

Performed by: S C Hartley, EMC Engineers.



**TEST RESULTS  
BLUETOOTH MODE**



## **MEASUREMENT AT THE BAND EDGE (Marker Delta Method)**

### **TEST PROCEDURE**

Testing to the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.205, for Restricted Bands of Operation was carried out on the Measurement Test Facility detailed in Annex A.  
The following Test Results were obtained using the FCC Public Notice document (DA 00-705 released 30 March 2000) for making measurements at the Band Edge, incorporating the 'Marker Delta Method'.

### **TEST RESULTS**

The EUT met the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.205 for Band Edge Measurements.

#### **Step 1**

Bottom Channel Fundamental Field Strength Measurement.

Peak measurements performed utilising a Resolution Bandwidth and Video Bandwidth of 1MHz.  
Average measurements performed utilising a Resolution Bandwidth of 1MHz and Video Bandwidth of 10Hz.

| Freq | Ant Pol | Hgt | Azi | Peak Field Strength | Average Field Strength |
|------|---------|-----|-----|---------------------|------------------------|
| MHz  | H/V     | cm  | deg | dBµV/m              | dBµV/m                 |
| 2402 | V       | 130 | 309 | 110.3               | 99.4                   |

Table of Results for Measurement at the Band Edge

#### **Step 2**

Determine Marker delta amplitude between 2402MHz fundamental and 2390MHz the Band Edge under investigation.

Using a span of 20MHz with Resolution Bandwidth and Video Bandwidth of 200kHz.

Marker Delta Amplitude 58.1dB

#### **Step 3**

By subtracting the Marker Delta obtained from Step 2 from the 2402MHz Field Strength measurement from Step 1, gives following Result

Peak of 52.2dBµV/m (Limit is 74.0dBµV/m)

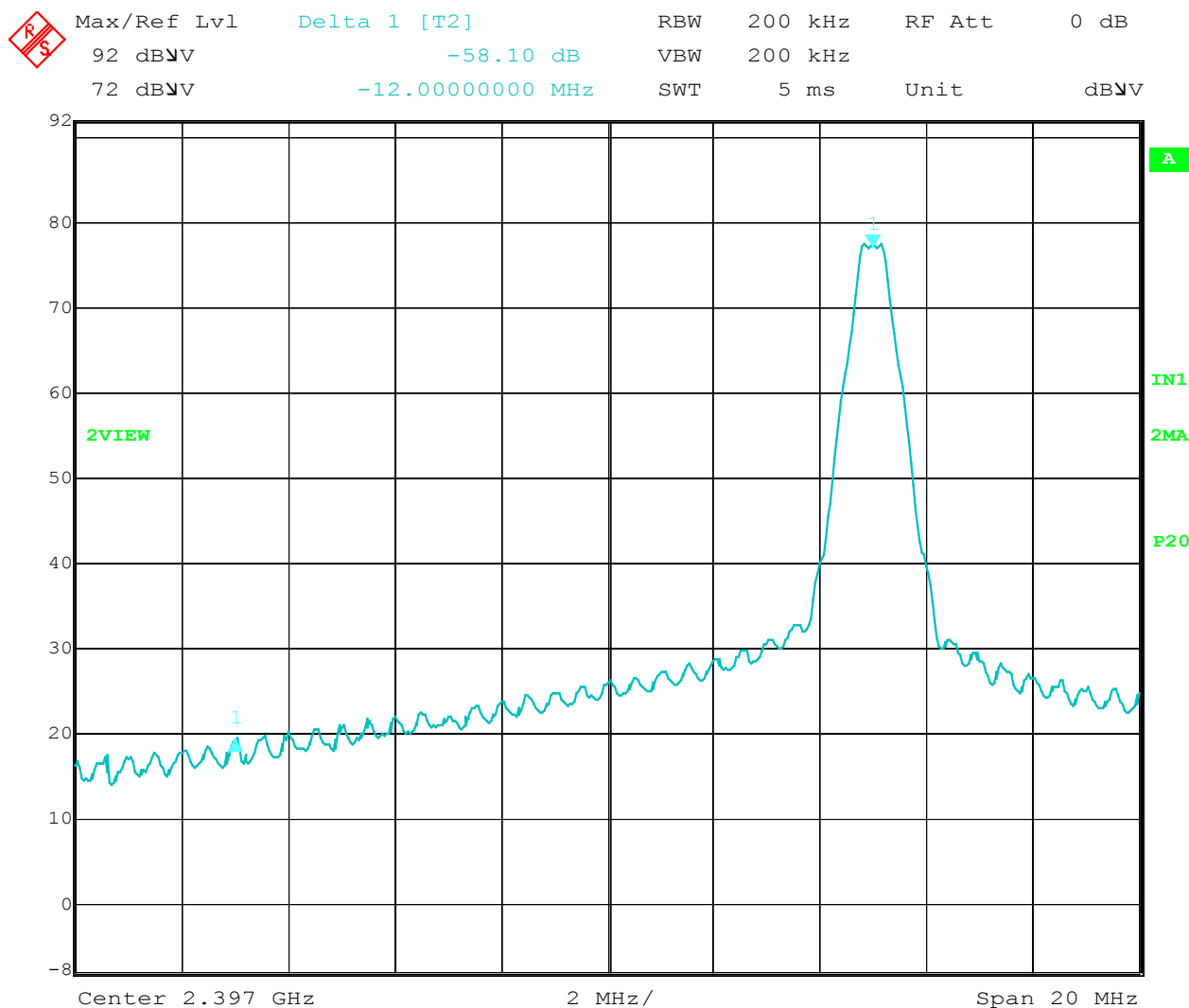
Average of 41.3dBµV/m (Limit is 54.0dBµV/m)



## MEASUREMENT AT THE BAND EDGE (Marker Delta Method) - continued

### TEST RESULTS - continued

Plot for Bottom Channel 2402MHz



Date: 18.NOV.2003 14:06:47



## **MEASUREMENT AT THE BAND EDGE (Marker Delta Method) - continued**

### **TEST RESULTS - continued**

#### **Step 1**

Top Channel Fundamental Field Strength Measurement.

Peak measurements performed utilising a Resolution Bandwidth and Video Bandwidth of 1MHz.

Average measurements performed utilising a Resolution Bandwidth of 1MHz and Video Bandwidth of 10Hz.

| Freq | Ant Pol | Hgt | Azi | Peak FS      | Average FS   |
|------|---------|-----|-----|--------------|--------------|
| GHz  | H/V     | cm  | deg | dB $\mu$ V/m | dB $\mu$ V/m |
| 2480 | V       | 131 | 7   | 111.5        | 100.0        |

Table of Results for Measurements at the Band Edge

#### **Step 2**

Determine Marker delta amplitude between 2480MHz fundamental and 2483.5MHz the Band Edge under investigation.

Using a span of 30MHz with Resolution Bandwidth and Video Bandwidth of 300kHz.

Marker Delta Amplitude 62.0dB

#### **Step 3**

By subtracting the Marker Delta obtained from Step 2 from the 2480MHz Field Strength measurement from Step 1, gives following Result

Peak of 49.5dB $\mu$ V/m (Limit is 74.0dB $\mu$ V/m)

Average of 38.0dB $\mu$ V/m (Limit is 54.0dB $\mu$ V/m)

Procedure: Test Performed in accordance with FCC Public Notice document (DA 00-705 released 30 March 2000)

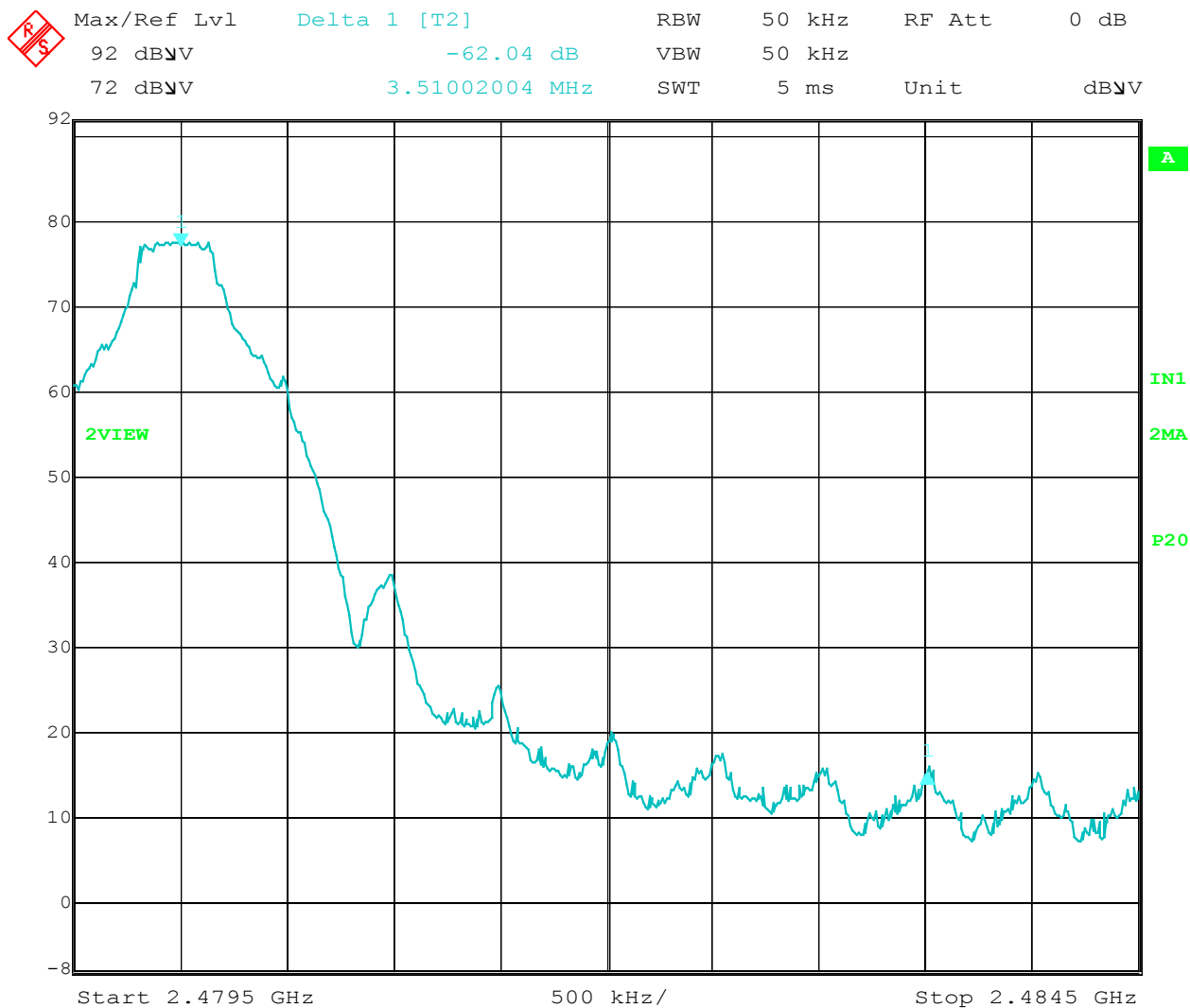
Performed by: S Hartley, EMC Engineer.



## MEASUREMENT AT THE BAND EDGE (Marker Delta Method) - continued

### TEST RESULTS - continued

Plot for Top Channel 2480MHz



Date: 18.NOV.2003 14:32:20





## **MAXIMUM PEAK OUTPUT POWER (EIRP Method)**

### **TEST PROCEDURE**

Testing to the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.247(b)(1), for Maximum Peak Output Power was carried out.

The EUT contains an integral antenna and therefore the Maximum Peak Output Power was made using the EIRP method.

The Spectrum Analyser was tuned to the test frequency. The device Output Power setting was controlled as specified in the System Configuration Section 1 of this document. The device was then rotated through 360 degrees until the highest power level was observed in both planes of polarisation. The device was then replaced with a substitution antenna, the signal to the antenna was adjusted to equal the related level detected from the device.

Maximum Peak Output Power measurements were made with the EUT set to continuous transmit at maximum power on the following channels:

2402MHz  
2441MHz  
2480MHz

### **TEST RESULTS**

The EUT met the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.247(b)(1) for Maximum Peak Output Power.

| Frequency<br>(MHz) | Result EIRP<br>(dBm) | Result EIRP<br>(mW) |
|--------------------|----------------------|---------------------|
| 2402               | 13.4                 | 21.7                |
| 2441               | 17.3                 | 53.7                |
| 2480               | 13.8                 | 24.0                |
| Limit              | < +36dBm or < 4W     |                     |

Table of Results for Maximum Peak Output Power

Procedure: Test Performed in accordance with FCC CFR 47: Part 15.247(b)(1) for Maximum Peak Output Power.

Performed by: G Lawler, EMC Engineer.



## **SPURIOUS RADIATED EMISSIONS**

### **TEST PROCEDURE**

Testing to the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.247(c), for Radiated Emissions was carried out on the Measurement Test Facility detailed in Annex A. Section 15.247(c) also requires Sections 15.205 and 15.209 to be applied.

A preliminary profile of the Radiated Emissions was obtained by operating the Equipment Under Test (EUT) on a remotely controlled turntable within a semi-anechoic chamber; measurements were taken at a 3m distance unless otherwise stated. Measurements of emissions from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations. The profiling produced a list of the worst-case emissions together with the EUT azimuth and antenna polarisation.

Using the information from the preliminary profiling of the EUT, a search was made in the frequency range 30MHz to 25GHz. The list of worst-case emissions was then confirmed or updated under Open Site conditions. Emission levels were maximised by adjusting the antenna height, antenna polarisation and turntable azimuth.

30MHz - 1GHz emissions levels were then formally measured a CISPR Quasi-Peak detector.  
1GHz - 25GHz emissions levels were then formally measured a Peak and Average detectors.  
(Note: Peak measurements performed using a Resolution and Video Bandwidth of 1MHz, Average measurements performed using a Resolution Bandwidth of 1MHz and a Video Bandwidth of 10Hz)

The EUT was operating off its internal battery, the battery was replaced at regular intervals to ensure optimum performance of the EUT.

Measurements were made with the EUT transmitting on the following channels.

2402MHz  
2441MHz  
2480MHz

Radiated Emissions from 30MHz to 1GHz were made using a HP 8542E Test Receiver.

Radiated Emissions from 1GHz to 25GHz were made using a Rhode and Schwarz ESIB 40 Test Receiver.

The measurements were performed at a 3m distance unless otherwise stated.

In accordance with FCC Public Notice DA 00-705, Released 30<sup>th</sup> March 2003, Section 15.247(c) Spurious Radiated Emissions "If the dwell time per channel of the hopping signal is less than 100ms, then the reading obtained with the 10Hz VBW may be further adjusted by a "duty cycle correction factor", derived from  $20\log(\text{dwell time}/100\text{ms})$ , in an effort to demonstrate compliance with the 15.209 limit the following adjustment has been calculated for use with Average Measurements only;

Dwell Time = 5.81ms this is derived from;

Total slot time per time slot for DH5 packet  $625\mu\text{s} \times 5 = 3.125\text{ms}$

Actual transmit time during this time slot is 2.905ms and the reply time slot after each DH5 packet is 625 $\mu\text{s}$ .

Total time slot length per channel  $3.125 + 0.625 = 3.75\text{ms}$ .

Multiply Total time slot length per channel by 32 channels per hop sequence  $32 \times 3.75 = 120\text{ms}$

It is therefore possible to have a maximum of two hop sequences in any given 100ms period, a single channel could occur twice within any 100ms time window.  $2 \times 2.905 = 5.81\text{ms}$

Therefore; the Bluetooth Duty Cycle Correction Factor for the EUT is  $20 \log (5.81/100) = -24.7\text{dB}$



## **SPURIOUS RADIATED EMISSIONS - continued**

### **TEST RESULTS**

#### **30MHz - 1GHz Frequency Range**

Equipment Designation: Intentional Radiator.

The EUT met the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.247(c), 15.205 and 15.209 for Radiated Emissions (30MHz – 1GHz).

#### **EUT Tx on Bottom Channel (2402MHz)**

30MHz – 1GHz Alternative Open Area Test Site Results: The levels of the 6 highest emissions measured in accordance with the specification are presented below: -

| Emission Frequency | Pol | Hgt | Azm | Field Strength at 3m |      | Specification Limit |       |
|--------------------|-----|-----|-----|----------------------|------|---------------------|-------|
| MHz                | H/V | cm  | deg | dBμV/m               | μV/m | dBμV/m              | μV/m  |
| 189.5              | V   | 100 | 138 | 22.4                 | 13.2 | 43.5                | 150.0 |
| 196.3              | V   | 100 | 149 | 23.9                 | 15.7 | 43.5                | 150.0 |
| 450.7              | V   | 100 | 0   | 23.6                 | 15.1 | 46.0                | 200.0 |
| 526.8              | V   | 100 | 0   | 25.2                 | 18.2 | 46.0                | 200.0 |
| 575.1              | V   | 100 | 324 | 26.1                 | 20.2 | 46.0                | 200.0 |
| 622.9              | H   | 100 | 183 | 31.0                 | 35.5 | 46.0                | 200.0 |

Table of Results for Spurious Radiated Emissions

#### **EUT Tx on Middle Channel (2441MHz)**

30MHz – 1GHz Alternative Open Area Test Site Results: The levels of the 6 highest emissions measured in accordance with the specification are presented below: -

| Emission Frequency | Pol | Hgt | Azm | Field Strength at 3m |      | Specification Limit |       |
|--------------------|-----|-----|-----|----------------------|------|---------------------|-------|
| MHz                | H/V | cm  | deg | dBμV/m               | μV/m | dBμV/m              | μV/m  |
| 189.5              | V   | 100 | 134 | 22.3                 | 13.0 | 43.5                | 150.0 |
| 196.5              | V   | 100 | 152 | 22.7                 | 13.6 | 45.3                | 150.0 |
| 451.1              | V   | 100 | 0   | 23.9                 | 15.7 | 46.0                | 200.0 |
| 527.7              | V   | 100 | 0   | 24.7                 | 17.2 | 46.0                | 200.0 |
| 574.8              | V   | 100 | 332 | 26.7                 | 21.6 | 46.0                | 200.0 |
| 623.3              | H   | 100 | 191 | 28.9                 | 27.9 | 46.0                | 200.0 |

Table of Results for Spurious Radiated Emissions



## **SPURIOUS RADIATED EMISSIONS - continued**

### **TEST RESULTS - continued**

#### **30MHz - 1GHz Frequency Range**

##### **EUT Tx on Top Channel (2480MHz)**

30MHz – 1GHz Alternative Open Area Test Site Results: The levels of the 6 highest emissions measured in accordance with the specification are presented below: -

| Emission Frequency | Pol | Hgt | Azm | Field Strength at 3m |      | Specification Limit |       |
|--------------------|-----|-----|-----|----------------------|------|---------------------|-------|
| MHz                | H/V | cm  | deg | dBµV/m               | µV/m | dBµV/m              | µV/m  |
| 189.4              | V   | 100 | 128 | 23.8                 | 15.5 | 43.5                | 150.0 |
| 196.3              | V   | 100 | 166 | 23.8                 | 15.5 | 43.5                | 150.0 |
| 450.9              | V   | 100 | 0   | 24.8                 | 17.4 | 46.0                | 200.0 |
| 526.4              | V   | 100 | 0   | 26.6                 | 21.4 | 46.0                | 200.0 |
| 575.1              | V   | 100 | 322 | 28.2                 | 25.7 | 46.0                | 200.0 |
| 622.9              | H   | 100 | 196 | 29.7                 | 30.5 | 46.0                | 200.0 |

Table of Results for Spurious Radiated Emissions

#### **ABBREVIATIONS FOR ABOVE TABLES**

H      Horizontal Polarisation  
Pol    Polarisation  
deg    degree

V      Vertical Polarisation  
Hgt    Height  
Azm    Azimuth

Procedure:                      Test Performed in accordance with ANSI C63.4.

Performed by:                G Lawler, EMC Engineers.



## **SPURIOUS RADIATED EMISSIONS - continued**

### **TEST RESULTS - continued**

#### **1GHz - 25GHz Range**

Equipment Designation: Intentional Radiator.

The EUT met the requirements of FCC CFR 47: Part 15.247(c), 15.205 and 15.209 for Spurious Radiated Emissions (1GHz – 25GHz).

#### **EUT Tx on Bottom Channel (2402MHz)**

Note: measurement of the carrier frequency (2402MHz) produced a Field Strength of 109.7dBµV/m. Therefore the specification limit for any spurious emissions found outside of the Restricted Band table (Section 15.205) is 89.7dBµV/m (carrier level minus 20dB).

| Frequency | Antenna      |        | Turntable | Peak Field Strength | Peak Limit | Average* Field Strength | Average Limit |
|-----------|--------------|--------|-----------|---------------------|------------|-------------------------|---------------|
|           | Polarisation | Height | Azimuth   |                     |            |                         |               |
| GHz       | H/V          | cm     | deg       | dBµV/m              | dBµV/m     | dBµV/m                  | dBµV/m        |
| 2.370     | V            | 132    | 310       | 56.5                | 74.0       | 20.9                    | 54.0          |
| 2.498     | V            | 132    | 6         | 59.5                | 74.0       | 25.1                    | 54.0          |
| 4.602     | V            | 145    | 174       | 57.9                | 74.0       | 25.7                    | 54.0          |
| 4.804     | V            | 114    | 173       | 73.8                | 74.0       | 39.5                    | 54.0          |
| 5.006     | V            | 116    | 185       | 60.0                | 74.0       | 27.8                    | 54.0          |
| 7.262     | V            | 105    | 182       | 63.0                | 74.0       | 30.7                    | 54.0          |
| 12.010    | H            | 129    | 222       | 64.1                | 74.0       | 30.0                    | 54.0          |

Table of Results for Spurious Radiated Emissions

\* The Average Field Strengths shown in the Tables above have been normalised by subtracting 24.7dB (Duty Cycle Correction Factor) from the measured Field Strength.

#### **EUT Tx on Middle Channel (2441MHz)**

Note: measurement of the carrier frequency (2441MHz) produced a Field Strength of 111.1dBµV/m. Therefore the specification limit for any spurious emissions found outside of the Restricted Band table (Section 15.205) is 91.1dBµV/m (carrier level minus 20dB).

| Frequency | Antenna      |        | Turntable | Peak Field Strength | Peak Limit | Average* Field Strength | Average Limit |
|-----------|--------------|--------|-----------|---------------------|------------|-------------------------|---------------|
|           | Polarisation | Height | Azimuth   |                     |            |                         |               |
| GHz       | H/V          | cm     | deg       | dBµV/m              | dBµV/m     | dBµV/m                  | dBµV/m        |
| 2.377     | V            | 138    | 86        | 61.2                | 74.0       | 24.3                    | 54.0          |
| 4.882     | V            | 114    | 173       | 69.4                | 74.0       | 34.2                    | 54.0          |
| 7.323     | H            | 100    | 211       | 61.0                | 74.0       | 27.7                    | 54.0          |
| 12.205    | H            | 144    | 222       | 66.2                | 74.0       | 30.8                    | 54.0          |

Table of Results for Radiated Emissions

\* The Average Field Strengths shown in the Tables above have been normalised by subtracting 24.7dB (Duty Cycle Correction Factor) from the measured Field Strength.



## **SPURIOUS RADIATED EMISSIONS - continued**

### **TEST RESULTS**

#### **1GHz - 25GHz Range**

##### **EUT Tx on Top Channel (2480MHz)**

Note: measurement of the carrier frequency (2480MHz) produced a Field Strength of 111.2dB $\mu$ V/m. Therefore the specification limit for any spurious emissions found outside of the Restricted Band table (Section 15.205) is 91.2dB $\mu$ V/m (carrier level minus 20dB)

| Frequency | Antenna      |        | Turntable | Peak Field Strength | Peak Limit   | Average* Field Strength | Average Limit |
|-----------|--------------|--------|-----------|---------------------|--------------|-------------------------|---------------|
|           | Polarisation | Height | Azimuth   |                     |              |                         |               |
| GHz       | H/V          | cm     | deg       | dB $\mu$ V/m        | dB $\mu$ V/m | dB $\mu$ V/m            | dB $\mu$ V/m  |
| 2.320     | V            | 135    | 87        | 54.7                | 74.0         | 20.2                    | 54.0          |
| 2.448     | V            | 131    | 74        | 62.6                | 91.2         | NA                      | NA            |
| 4.960     | V            | 112    | 173       | 70.7                | 74.0         | 37.0                    | 54.0          |
| 5.617     | H            | 100    | 245       | 45.9                | 91.2         | NA                      | NA            |
| 6.782     | H            | 121    | 205       | 51.7                | 91.2         | NA                      | NA            |
| 7.439     | H            | 118    | 219       | 60.7                | 74.0         | 24.7                    | 54.0          |
| 9.920     | H            | 105    | 253       | 50.8                | 91.2         | NA                      | NA            |
| 12.400    | H            | 115    | 187       | 59.8                | 74.0         | 24.0                    | 54.0          |

Table of Results for Spurious Radiated Emissions

\* The Average Field Strengths shown in the Tables above have been normalised by subtracting 24.7dB (Duty Cycle Correction Factor) from the measured Field Strength.

Note: The Measurements in the above table marked N/A are Not Applicable because the frequency does not fall within the Restricted Band (15.205) and hence Average Measurements are not required.

Procedure: Test Performed in accordance with ANSI C63.4.

Performed by: A Guy & G Lawler, EMC Engineers.

# PHOTOGRAPHS OF EQUIPMENT



Photograph 2  
Front view

**PHOTOGRAPHS OF EQUIPMENT**



Photograph 3  
Rear view

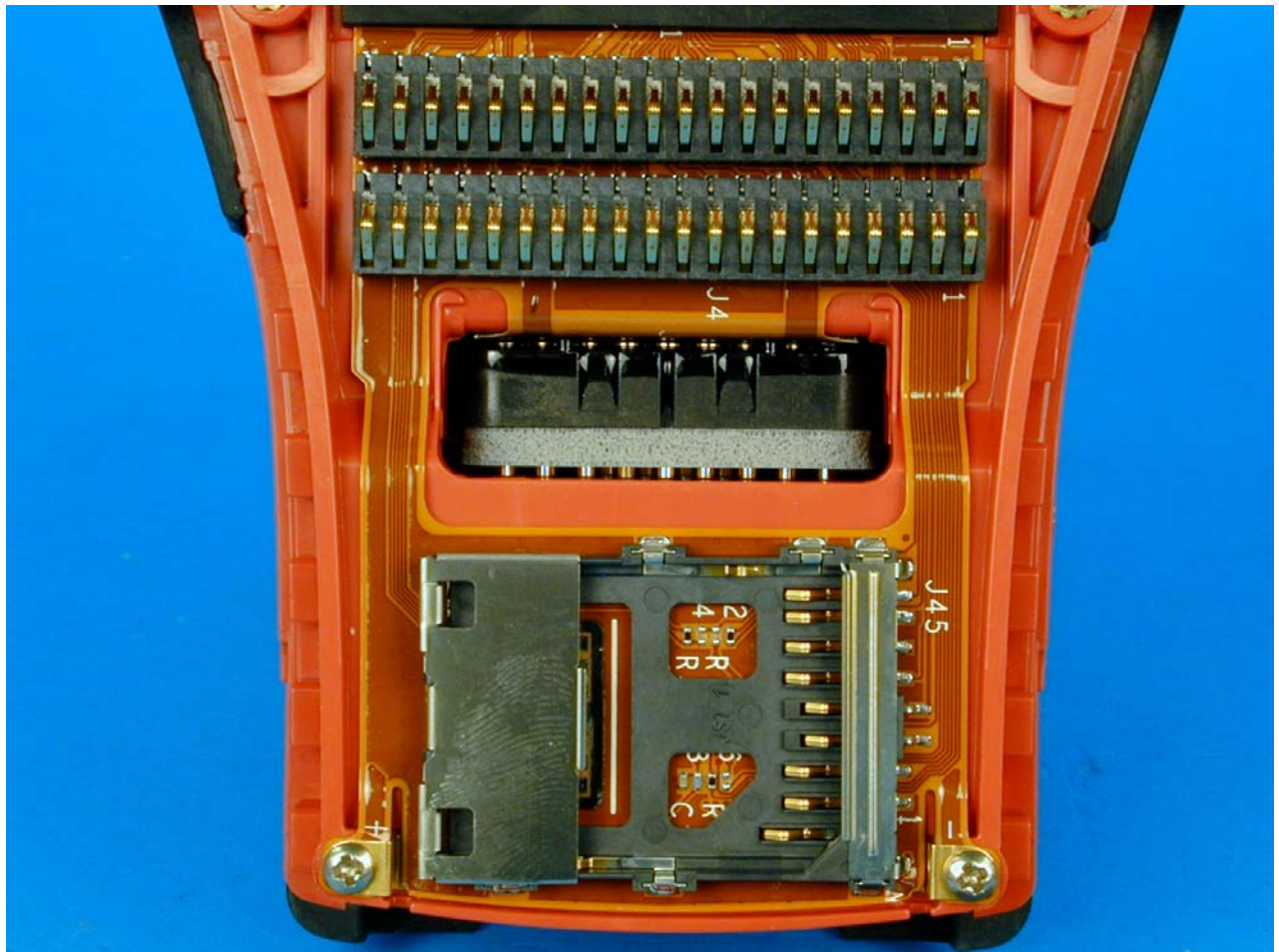


## PHOTOGRAPHS OF EQUIPMENT



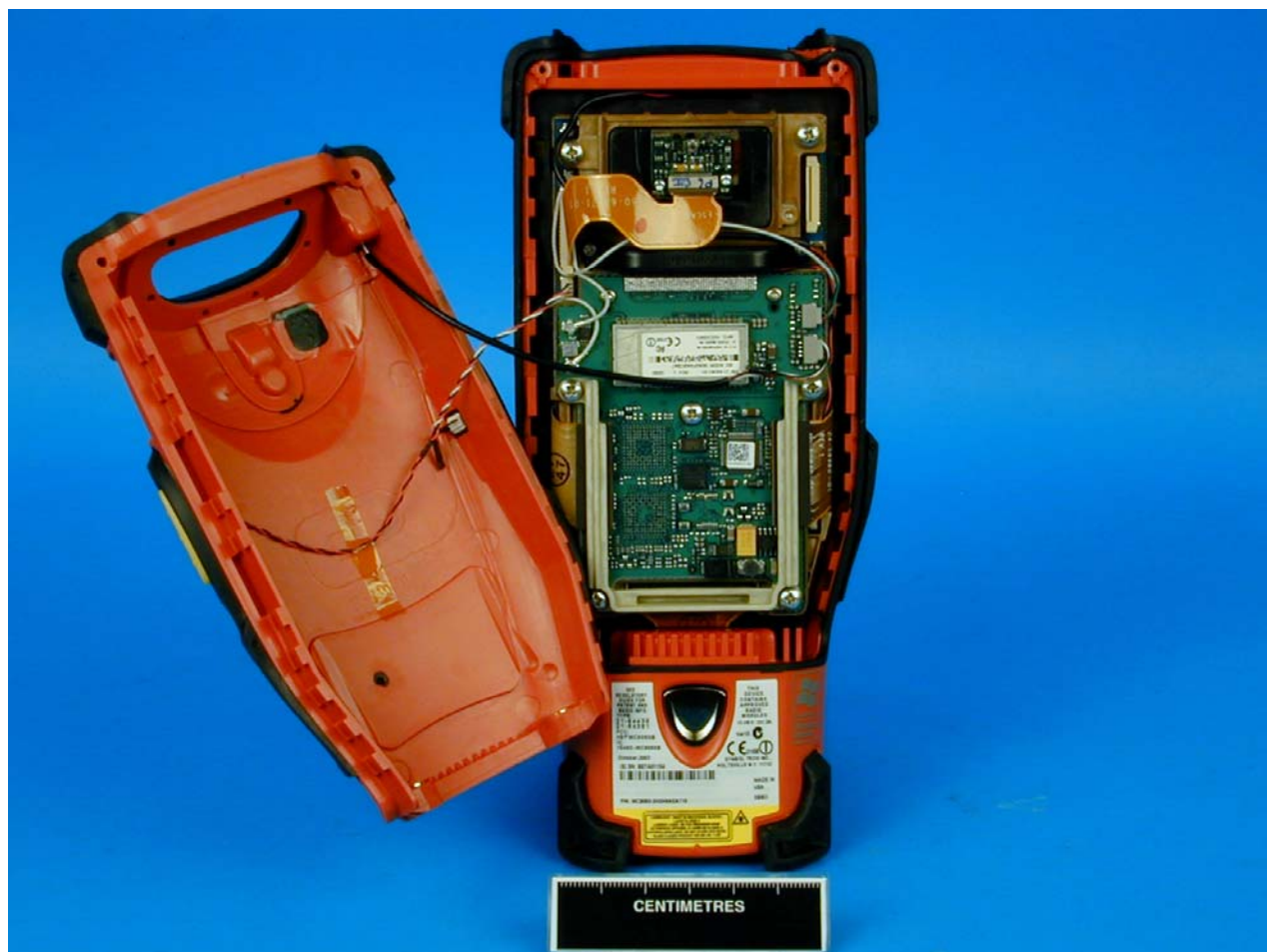
Photograph 4  
Internal View 1

PHOTOGRAPHS OF EQUIPMENT



Photograph 5  
Internal View 2

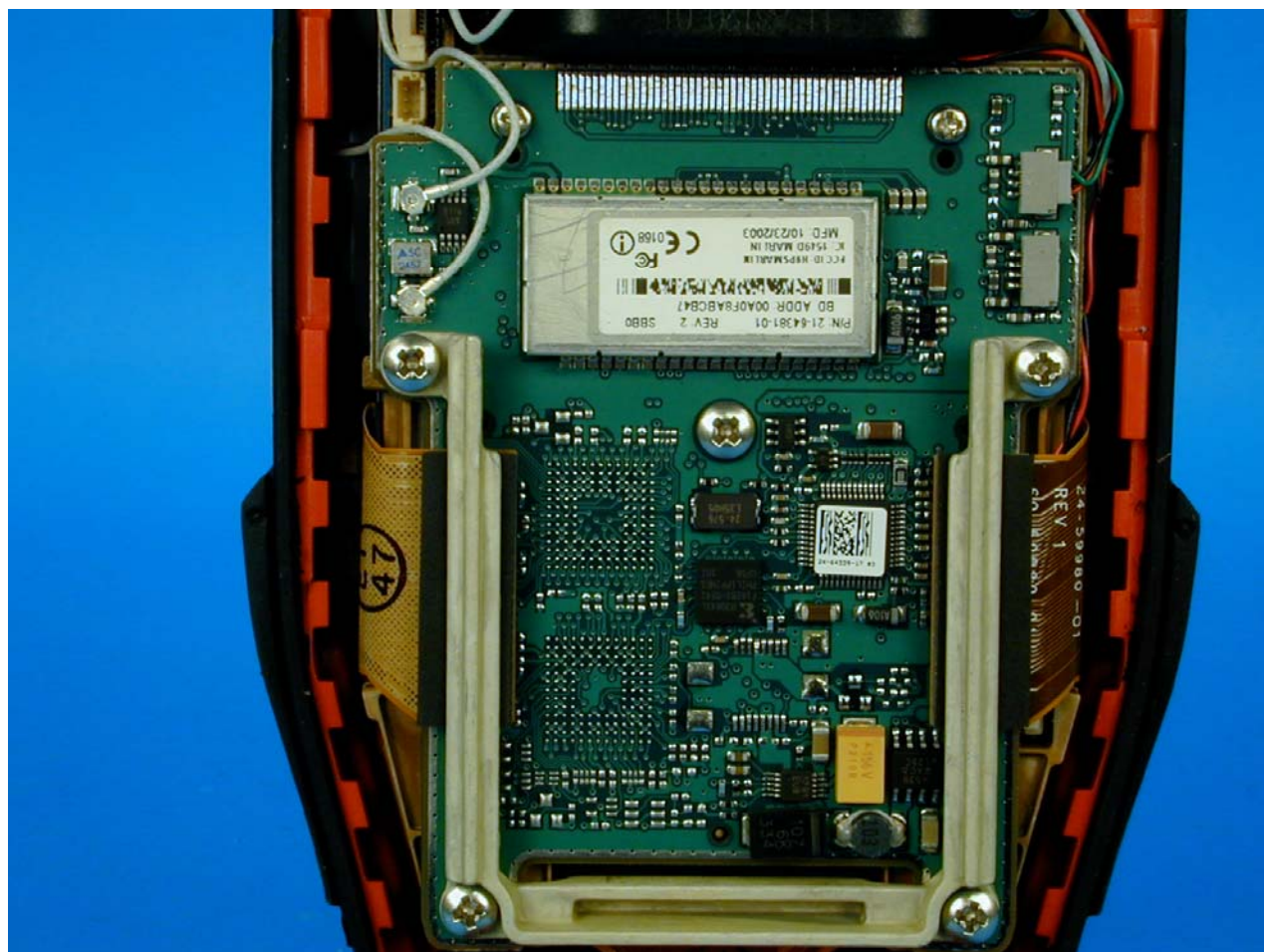
# PHOTOGRAPHS OF EQUIPMENT



Photograph 6  
Internal View 3

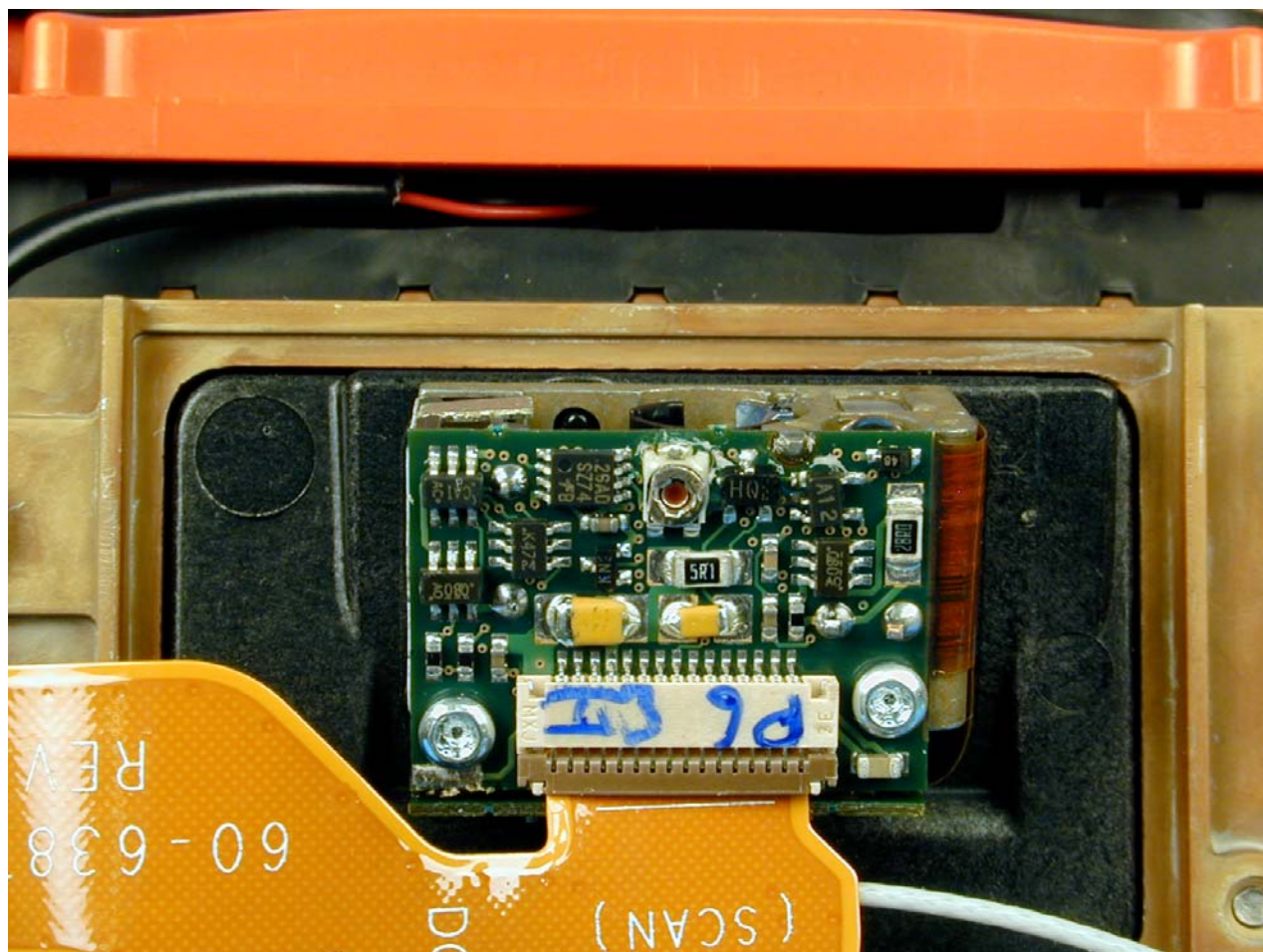


# PHOTOGRAPHS OF EQUIPMENT



Photograph 7  
Internal View 4

# PHOTOGRAPHS OF EQUIPMENT



Photograph 8  
Internal View 5

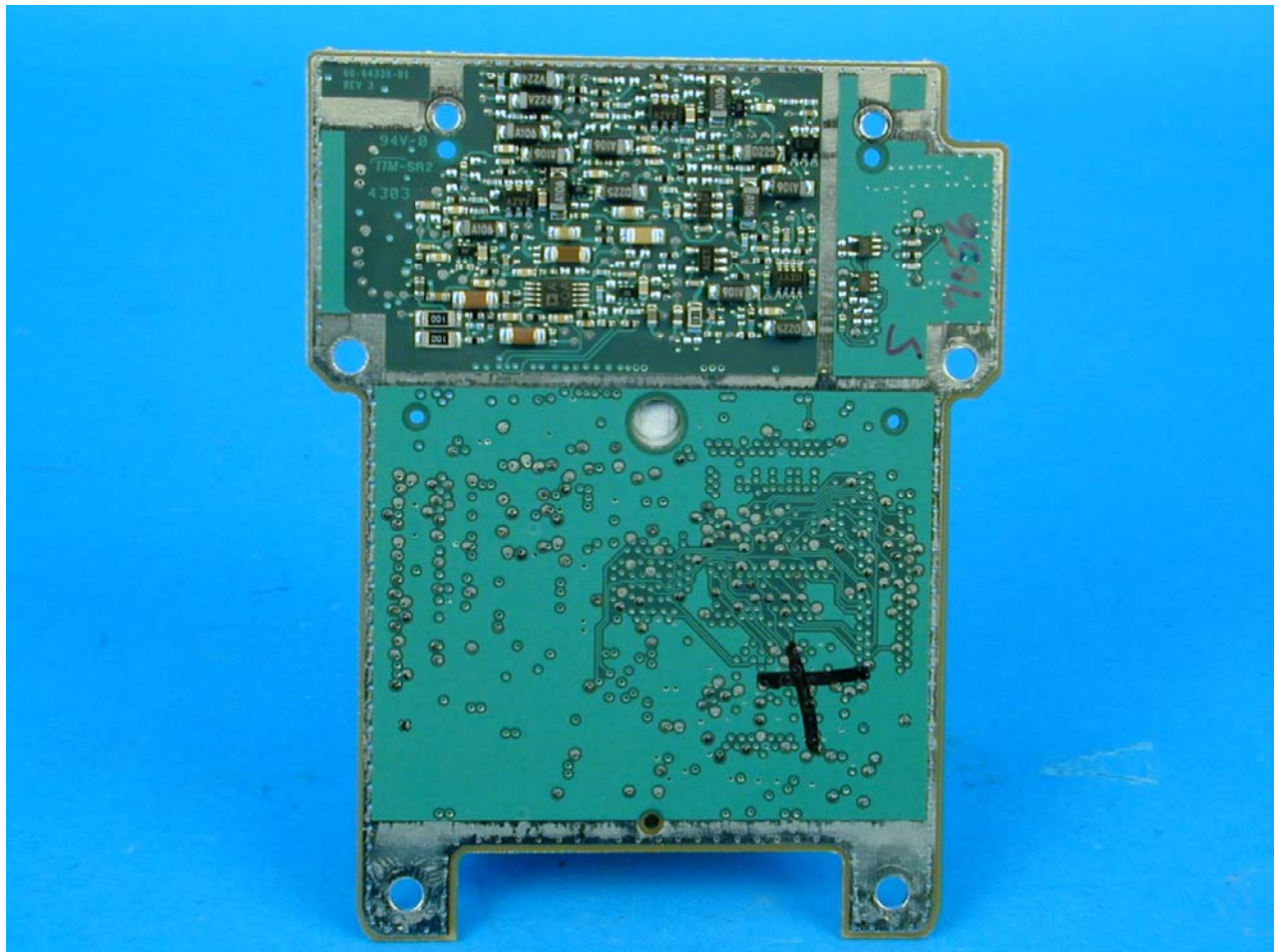
# PHOTOGRAPHS OF EQUIPMENT



Photograph 9  
Internal View 6



# PHOTOGRAPHS OF EQUIPMENT



Photograph 10  
Internal View 7

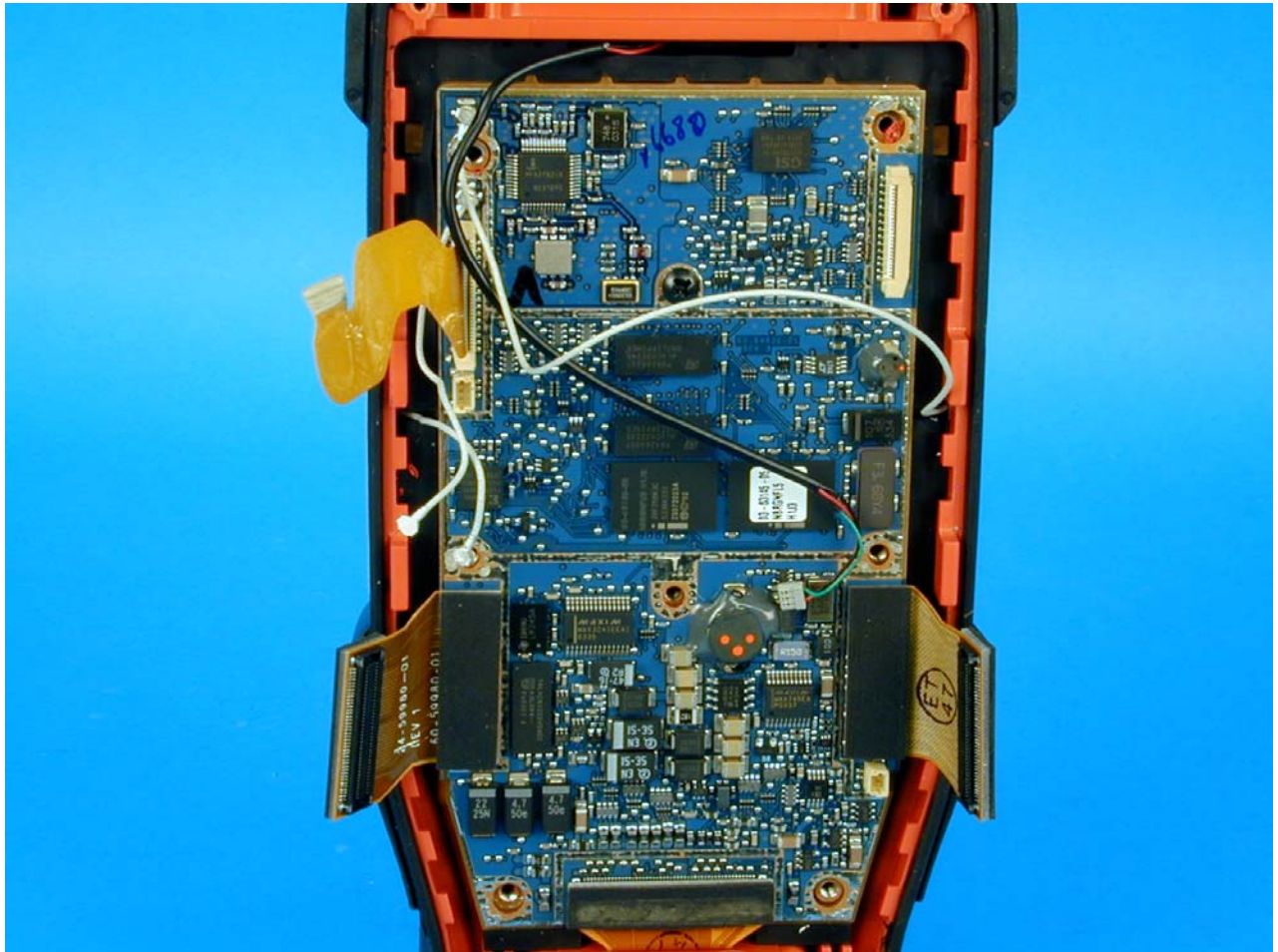
PHOTOGRAPHS OF EQUIPMENT



Photograph 11  
Internal View 7

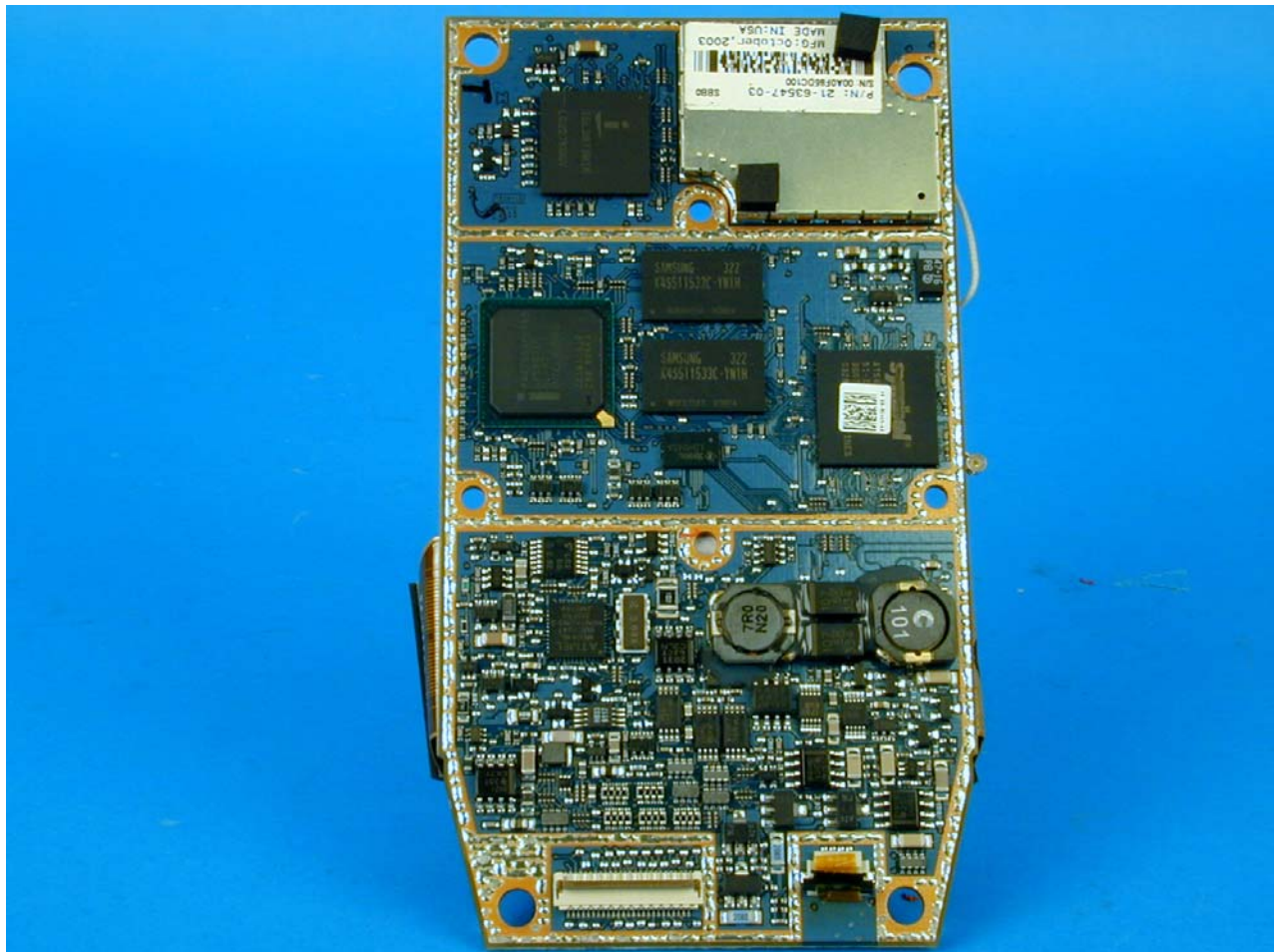


## PHOTOGRAPHS OF EQUIPMENT



Photograph 12  
Internal View 8

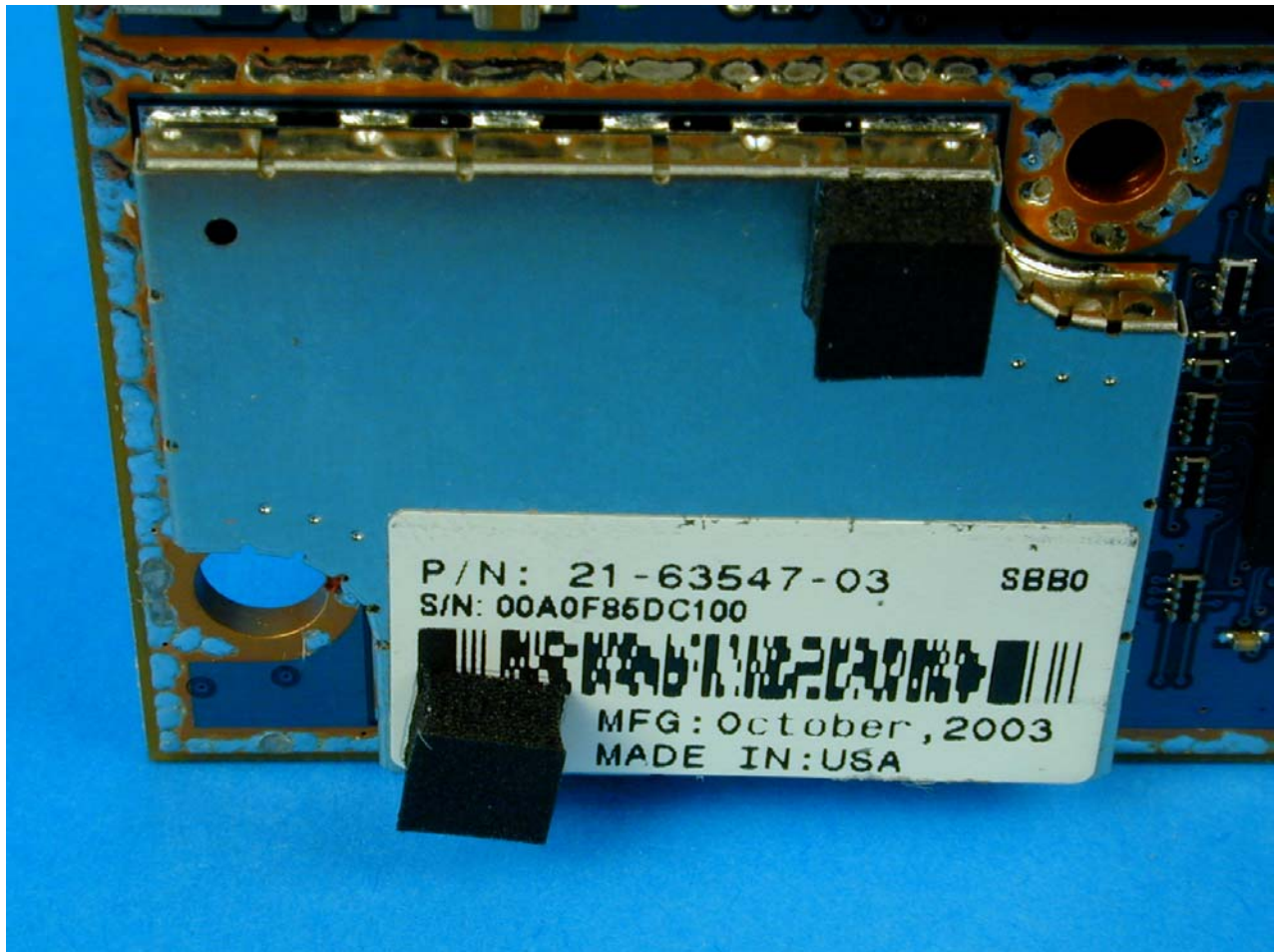
# PHOTOGRAPHS OF EQUIPMENT



Photograph 13  
Internal View 9



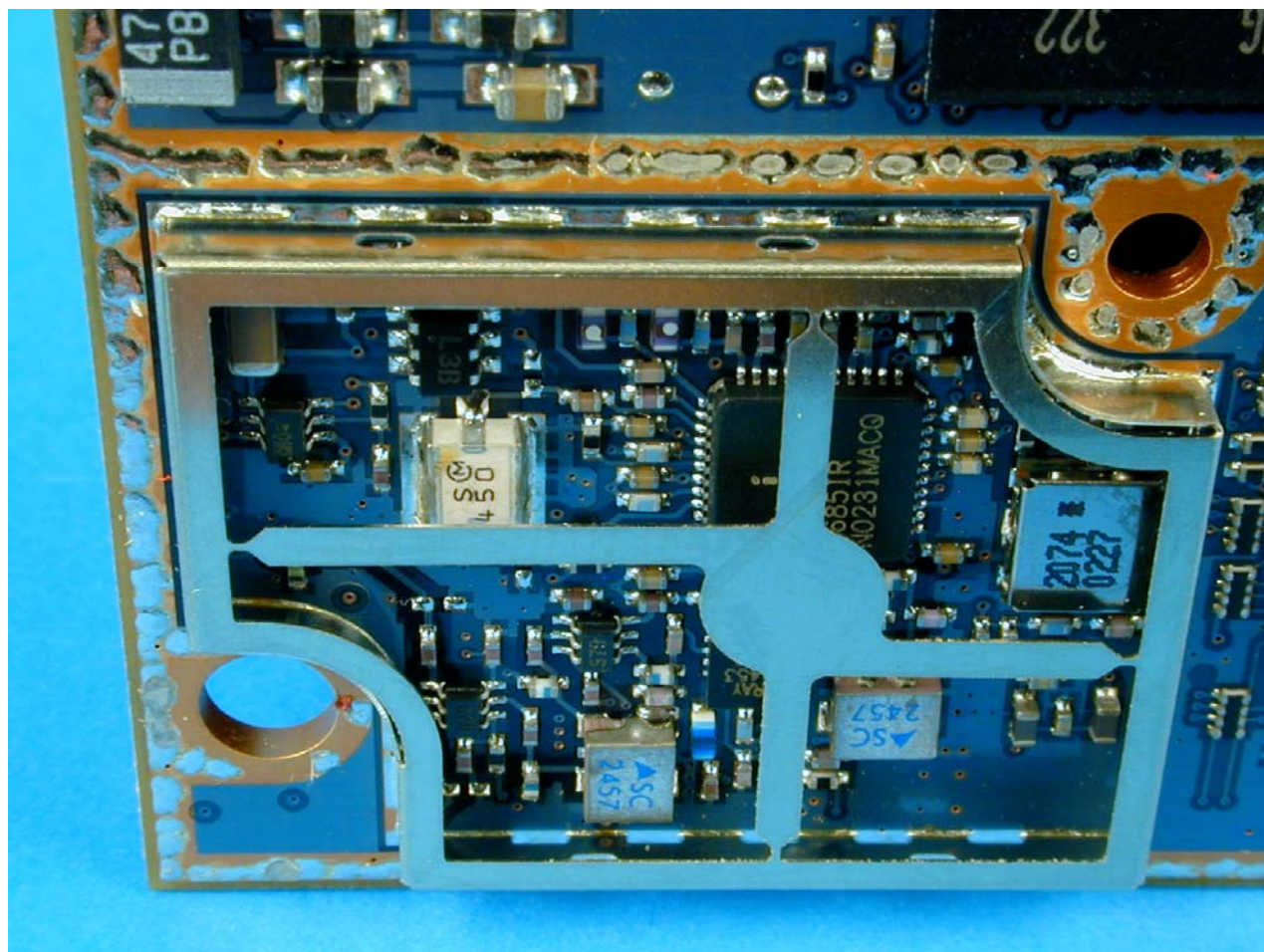
PHOTOGRAPHS OF EQUIPMENT



Photograph 14  
Internal View 10



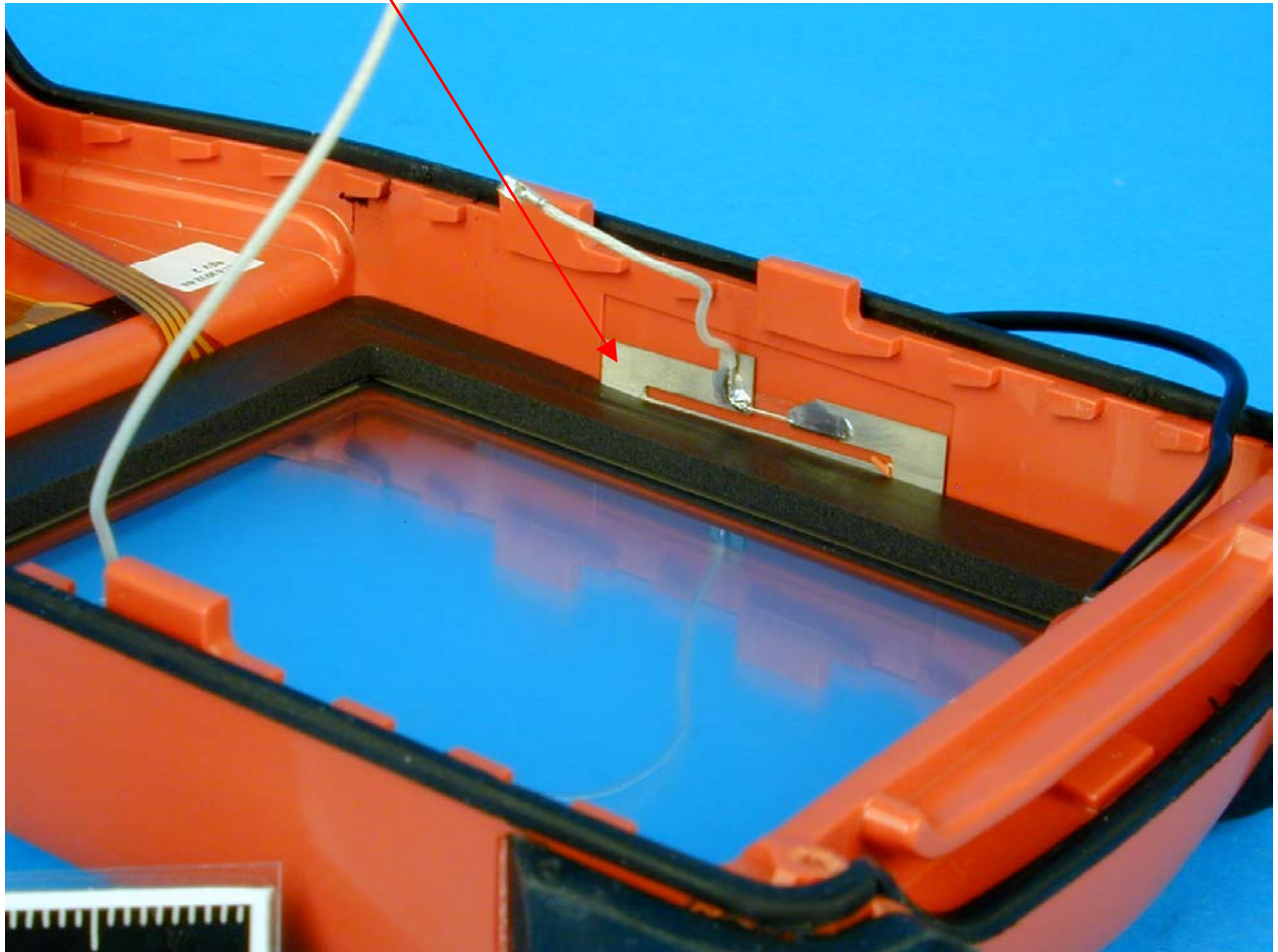
# PHOTOGRAPHS OF EQUIPMENT



Photograph 15  
Internal View 11

**PHOTOGRAPHS OF EQUIPMENT**

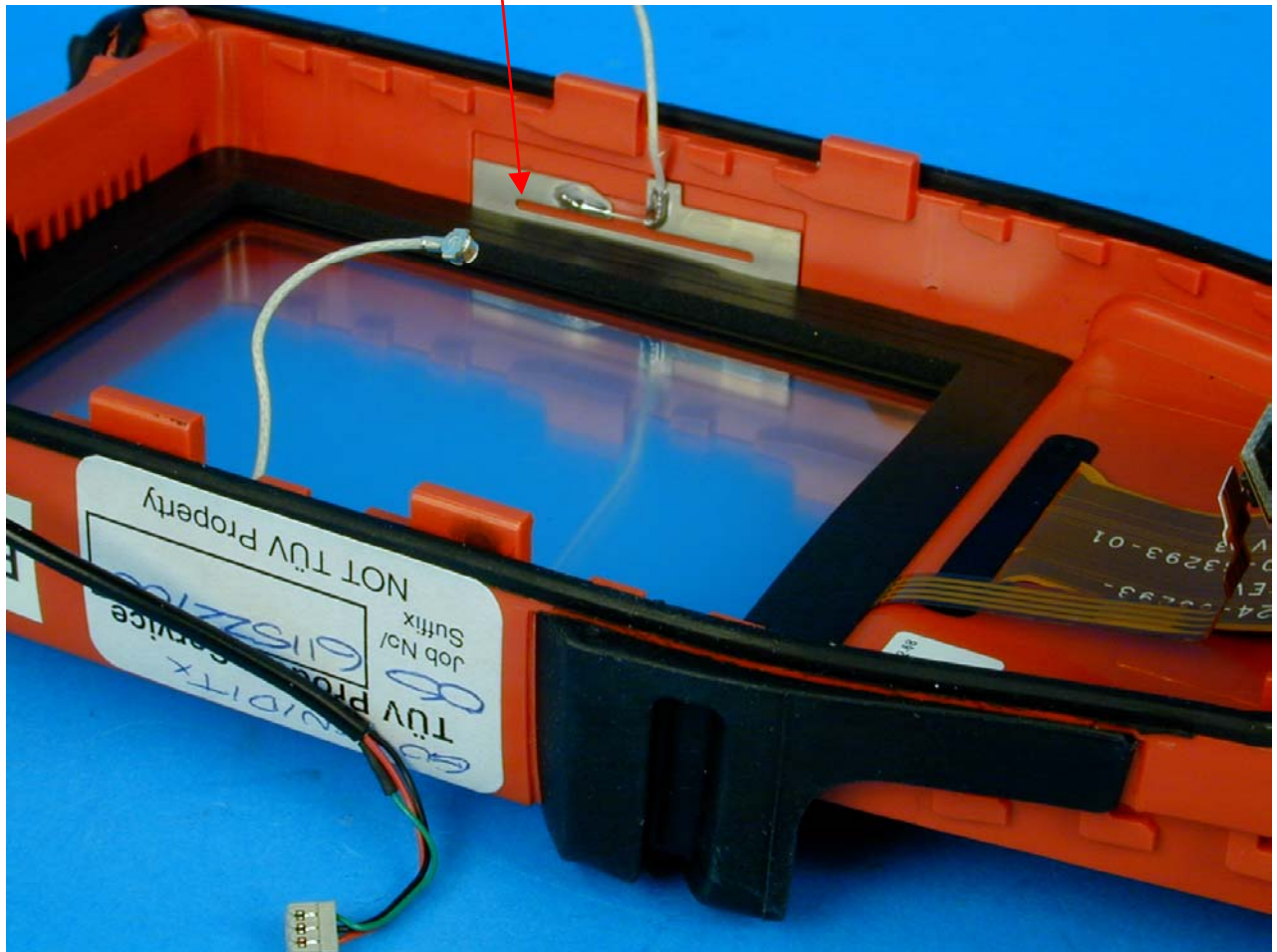
**2.4GHz RLAN and Bluetooth Antenna (shared)**



Photograph 16  
Antenna View 1

## PHOTOGRAPHS OF EQUIPMENT

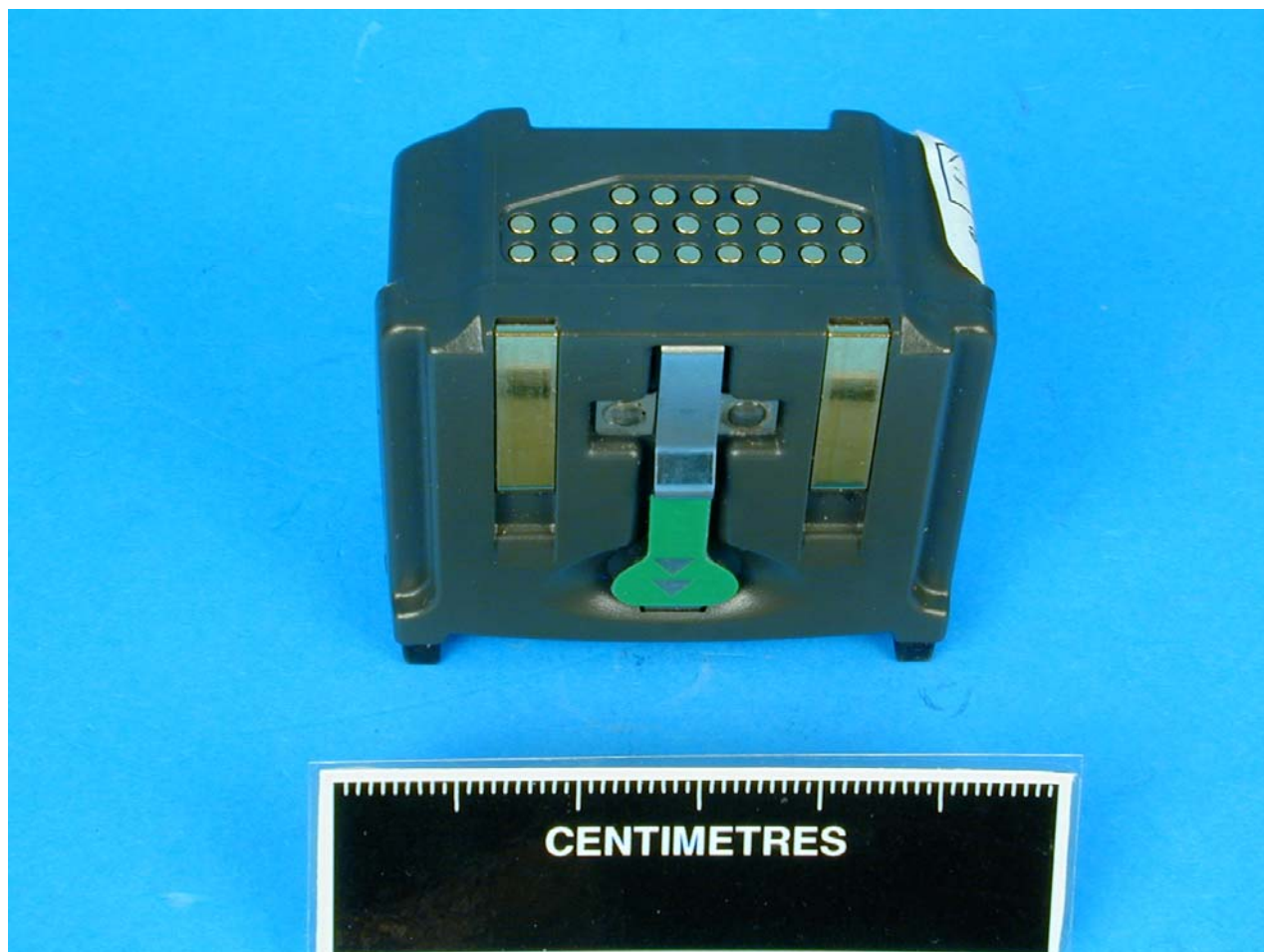
### 2.4GHz RLAN Antenna



Photograph 17  
Antenna View 2



PHOTOGRAPHS OF EQUIPMENT



Photograph 18  
Battery View

PHOTOGRAPHS OF EQUIPMENT



Photograph 19  
Headset View



## PHOTOGRAPHS OF EQUIPMENT



Photograph 20  
Label View 1

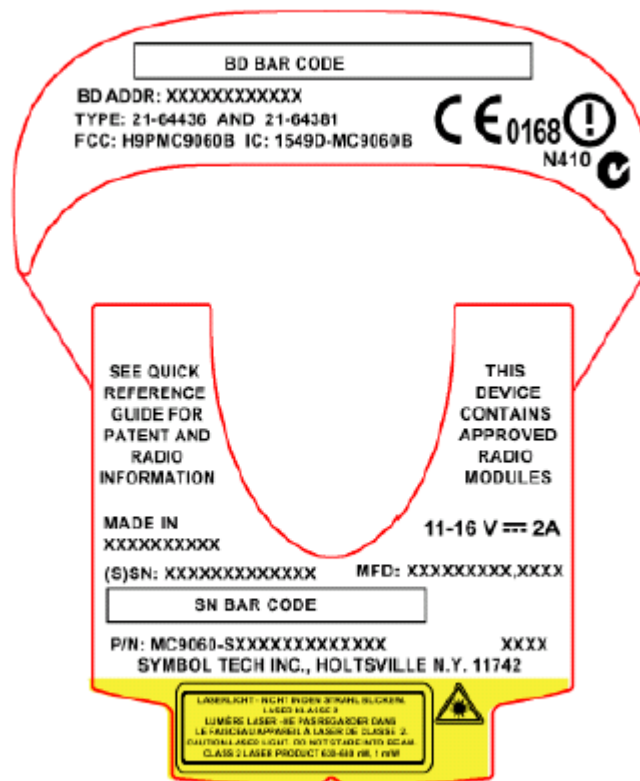
# PHOTOGRAPHS OF EQUIPMENT



Photograph 21  
Label View 2



## MANUFACTURER'S LABEL DRAWING



Not to scale



## **MEASUREMENT UNCERTAINTY**

For a 95% confidence level, the measurement uncertainties for defined systems are: -

In the frequency range 30MHz to 1000MHz

|                   |                         |
|-------------------|-------------------------|
| For 6dB Bandwidth |                         |
| Frequency         | $\pm 210.894\text{kHz}$ |
| Amplitude         | $\pm 0.5\text{dB}$      |

|                          |                    |
|--------------------------|--------------------|
| For Maximum Output Power |                    |
| Amplitude                | $\pm 0.5\text{dB}$ |

|                                  |                    |
|----------------------------------|--------------------|
| For Spurious Conducted Emissions |                    |
| Amplitude                        | $\pm 3.0\text{dB}$ |

For Radiated Emissions, Quasi-Peak Measurements using the ESVP Test Receiver and Bilog Antenna: -

|           |                                  |
|-----------|----------------------------------|
| Frequency | $\pm 5\text{ppm} + 500\text{Hz}$ |
| Amplitude | $\pm 4.1\text{dB}$               |

In the frequency range 1GHz to 25GHz

For Spurious Radiated Emissions measurements: -

|           |                                                       |
|-----------|-------------------------------------------------------|
| Frequency | $\pm 2 \times 10^{-7} \times \text{Centre Frequency}$ |
| Amplitude | $\pm 3.4\text{dB}$                                    |

|                                 |                    |
|---------------------------------|--------------------|
| For Peak Power Spectral Density |                    |
| Amplitude                       | $\pm 1.8\text{dB}$ |



This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA  
(Not UKAS Accredited).

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**ANNEX A**  
**FCC SITE COMPLIANCE LETTERS**



## **FEDERAL COMMUNICATIONS COMMISSION**

**Laboratory Division  
7435 Oakland Mills Road  
Columbia, MD 21046**

**October 18, 2002**

**Registration Number: 90987**

**TUV Product Service Ltd  
Segensworth Road  
Titchfield  
Fareham, Hampshire, PO15 5RH  
United Kingdom  
Attention: Kevan Adsetts**

**Re: Measurement facility located at Titchfield  
Anechoic chamber (3 meters) and 3 & 10 meter OATS  
Date of Listing: October 18, 2002**

**Gentlemen:**

Your request for registration of the subject measurement facility has been reviewed and found to be in compliance with the requirements of Section 2.948 of the FCC rules. The information has, therefore, been placed on file and the name of your organization added to the list of facilities whose measurement data will be accepted in conjunction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Please note that the file must be updated for any changes made to the facility and the registration must be renewed at least every three years.

Measurement facilities that have indicated that they are available to the public to perform measurement services on a fee basis may be found on the FCC website [www.fcc.gov](http://www.fcc.gov) under E-Filing, OET Equipment Authorization Electronic Filing, Test Firms.

Sincerely,

**Thomas W Phillips  
Electronics Engineer**