

TEST REPORT NO: RL1021/285

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**REPORT ON THE  
CERTIFICATION TESTING OF A  
RENISHAW METROLOGY LTD  
MI16-224, PSU3, OM16 & RMM  
MACHINE INTERFACE RECEIVER  
S/No's P34424, Q04565, P41078, P56933 & P82252  
WITH RESPECT TO  
THE FCC 47CFR Pt's 15.107, 15.109 & 15.111  
CLASS B UNINTENTIONAL RADIATOR  
SPECIFICATION**

TEST DATE: 25 JANUARY - 8 MARCH 1999

TESTED BY: RP I Parry R P I PARRY

APPROVED BY: SP Hayes S P HAYES

ISSUE DATE: 23rd April 1999

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## CONTENTS

|                                                                                                                                                                                                     | page      |            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------|
| APPLICANT'S SUMMARY                                                                                                                                                                                 | 3         |            |
| CERTIFICATE OF CONFORMITY & COMPLIANCE                                                                                                                                                              | 4         |            |
| DESCRIPTION OF RECEIVER                                                                                                                                                                             | 4         |            |
| EQUIPMENT TEST CONDITIONS                                                                                                                                                                           | 5         |            |
| TESTS REQUIRED                                                                                                                                                                                      | 6         |            |
| SAMPLE CALCULATIONS                                                                                                                                                                                 | 6         |            |
| TEST RESULTS                                                                                                                                                                                        | 7 - 10    |            |
| PHOTOGRAPHS                                                                                                                                                                                         | ANNEX A   | [X]        |
| PHOTOGRAPH No 1: Test site with Rx, radiated & conducted.                                                                                                                                           | ANNEX A1  |            |
| PHOTOGRAPH No 2: Rx, front view.                                                                                                                                                                    | ANNEX A2  |            |
| PHOTOGRAPH No 3: Rx, rear view, w/o case covers.                                                                                                                                                    | ANNEX A3  |            |
| PHOTOGRAPH No 4: Rx, interior, top view, w/o shields.                                                                                                                                               | ANNEX A4  |            |
| PHOTOGRAPH No 5: Rx, interior, bottom view.                                                                                                                                                         | ANNEX A5  |            |
| PHOTOGRAPH No 6: Rx, front panel pcb, front view.                                                                                                                                                   | ANNEX A6  |            |
| PHOTOGRAPH No 7: Rx, front panel pcb, rear view.                                                                                                                                                    | ANNEX A7  |            |
| PHOTOGRAPH No 8: PSU, front view.                                                                                                                                                                   | ANNEX A8  |            |
| PHOTOGRAPH No 9: PSU, rear view.                                                                                                                                                                    | ANNEX A9  |            |
| PHOTOGRAPH No 10: PSU pcb, top view.                                                                                                                                                                | ANNEX A10 |            |
| PHOTOGRAPH No 11: PSU pcb, bottom view.                                                                                                                                                             | ANNEX A11 |            |
| PHOTOGRAPH No 12: Optical interface assy.                                                                                                                                                           | ANNEX A12 |            |
| PHOTOGRAPH No 13: General view of MI16 system                                                                                                                                                       | ANNEX A13 |            |
| TEST EQUIPMENT LIST                                                                                                                                                                                 | ANNEX B   | [X]        |
| APPLICANT'S SUBMISSION OF DOCUMENTATION LIST                                                                                                                                                        | ANNEX C   | [X]        |
| MEASURING DISTANCE EXTRAPOLATION GRAPH(S)                                                                                                                                                           | ANNEX D   | [n/a]      |
| <b>Notes:-</b>                                                                                                                                                                                      |           |            |
| 1. Component failure during test                                                                                                                                                                    | YES<br>NO | [ ]<br>[X] |
| 2. If Yes, details of failure:-                                                                                                                                                                     |           |            |
| 3. All measurement uncertainty calculations detailed in this report are carried out in accordance with UKAS Publication NIS 81, Edition 1, May 1994, for a 95% confidence level.                    |           |            |
| 4. The contents of the attached applicant's declarations and other supplied information are not covered by the scope of this laboratory's UKAS or FCC accreditations and is provided in good faith. |           |            |

## APPLICANT'S SUMMARY

EQUIPMENT UNDER TEST (EUT): MI16-224, PSU3, OM16 & RMM

EQUIPMENT TYPE: MACHINE INTERFACE RECEIVER

SERIAL NUMBER OF EUT: S/No's P34424, Q04565, P41078, P56933 & P82252

PURPOSE OF TEST: FCC CERTIFICATION

TEST SPECIFICATION: FCC 47CFR Pt's 15.107, 15.109 (Class B) & 15.111

RESULT OF TEST: COMPLIANT YES ☒  
NO ☐

CATEGORY OF APPLICANT: ( a ) MANUFACTURER ☒  
( b ) IMPORTER ☐  
( c ) DISTRIBUTOR ☒  
( d ) AGENT ☐

APPLICANT'S ORDER NO: RM095794 & RM099234

APPLICANT'S CONTACT PERSON: MARTIN WOOLLETT

APPLICANT: RENISHAW METROLOGY LTD

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EUT(s) COUNTRY OF ORIGIN: UNITED KINGDOM

TEST LABORATORY: TRL EMC LTD

UKAS ACCREDITATION NO: 0728

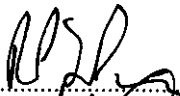
DATE OF TEST: 25 JANUARY - 8 MARCH 1999

TEST REPORT No: RL1021/285

## CERTIFICATE OF CONFORMITY & COMPLIANCE

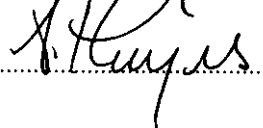
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|-------------------------|-----------------------------------------------------------------------------------------------------------|
| FCC IDENTITY:           | KQG MI16-224                                                                                              |
| PURPOSE OF TEST:        | FCC Certification                                                                                         |
| TEST SPECIFICATION:     | FCC 47CFR, Parts 15.107, 15.109 (Class B) & 15.111                                                        |
| TEST RESULT:            | Compliant to Specification                                                                                |
| EQUIPMENT UNDER TEST:   | MI16-224, PSU3, OM16 & RMM                                                                                |
| EQUIPMENT SERIAL No:    | S/No's P34424, Q04565, P41078, P56933 & P82252                                                            |
| ITU EMISSION CODE:      | 7K00F2DAN                                                                                                 |
| EQUIPMENT TYPE:         | Machine Interface Receiver                                                                                |
| UTILISATION:            | Machine Tool Telemetry                                                                                    |
| ANTENNA TYPE:           | Fixed, or Integral [ ] ; Coaxial Output [X]                                                               |
| BAND OF OPERATION:      | 224.5MHz to 225.475MHz                                                                                    |
| CHANNEL SPACING:        | 25kHz                                                                                                     |
| No. of CHANNELS:        | 40                                                                                                        |
| FREQUENCY CONVERSION:   | Superhet [X] ; Direct [ ]                                                                                 |
| FREQUENCY GENERATION:   | SAW Resonator [ ] ; Crystal [ ] ; Synthesizer [X]                                                         |
| INTERMEDIATE FREQUENCY: | 1 <sup>st</sup> , 21.4MHz [X] ; 2 <sup>nd</sup> , 455kHz [X] ; 3 <sup>rd</sup> [ ]                        |
| LOCAL OSCILLATOR:       | Higher [ ] ; Lower [X] ; not applicable [ ]                                                               |
| MODULATION METHOD:      | Amplitude [ ] ; Digital [ ] ; Angle [X]                                                                   |
| POWER SOURCE(s):        | +24Vdc, via 110Vac PSU                                                                                    |
| TEST DATE:              | 25 JANUARY - 8 MARCH 1999                                                                                 |
| ORDER No(s):            | RM095794 & RM099234                                                                                       |
| APPLICANT:              | RENISHAW METROLOGY LTD<br>NEW MILLS<br>WOTTON-UNDER-EDGE<br>GLOUCESTERSHIRE<br>GL12 8JR<br>UNITED KINGDOM |

TESTED BY:



R P I PARRY

APPROVED BY:



S P HAYES  
EMC MANAGER

1. *Introduction*  
 2. *Background*  
 3. *Methodology*  
 4. *Results*  
 5. *Discussion*  
 6. *Conclusion*  
 7. *References*  
 8. *Appendix*  
 9. *Notes*  
 10. *References*  
 11. *Appendix*  
 12. *Notes*  
 13. *References*  
 14. *Appendix*  
 15. *Notes*  
 16. *References*  
 17. *Appendix*  
 18. *Notes*  
 19. *References*  
 20. *Appendix*  
 21. *Notes*  
 22. *References*  
 23. *Appendix*  
 24. *Notes*  
 25. *References*  
 26. *Appendix*  
 27. *Notes*  
 28. *References*  
 29. *Appendix*  
 30. *Notes*  
 31. *References*  
 32. *Appendix*  
 33. *Notes*  
 34. *References*  
 35. *Appendix*  
 36. *Notes*  
 37. *References*  
 38. *Appendix*  
 39. *Notes*  
 40. *References*  
 41. *Appendix*  
 42. *Notes*  
 43. *References*  
 44. *Appendix*  
 45. *Notes*  
 46. *References*  
 47. *Appendix*  
 48. *Notes*  
 49. *References*  
 50. *Appendix*  
 51. *Notes*  
 52. *References*  
 53. *Appendix*  
 54. *Notes*  
 55. *References*  
 56. *Appendix*  
 57. *Notes*  
 58. *References*  
 59. *Appendix*  
 60. *Notes*  
 61. *References*  
 62. *Appendix*  
 63. *Notes*  
 64. *References*  
 65. *Appendix*  
 66. *Notes*  
 67. *References*  
 68. *Appendix*  
 69. *Notes*  
 70. *References*  
 71. *Appendix*  
 72. *Notes*  
 73. *References*  
 74. *Appendix*  
 75. *Notes*  
 76. *References*  
 77. *Appendix*  
 78. *Notes*  
 79. *References*  
 80. *Appendix*  
 81. *Notes*  
 82. *References*  
 83. *Appendix*  
 84. *Notes*  
 85. *References*  
 86. *Appendix*  
 87. *Notes*  
 88. *References*  
 89. *Appendix*  
 90. *Notes*  
 91. *References*  
 92. *Appendix*  
 93. *Notes*  
 94. *References*  
 95. *Appendix*  
 96. *Notes*  
 97. *References*  
 98. *Appendix*  
 99. *Notes*  
 100. *References*

1.

| EQUIPMENT<br>SERIAL / MODEL<br>IDENTITY | CHANNEL<br>NUMBER | Rx NOMINAL<br>FREQUENCY<br>MHz | TESTS<br>REQUIRED | REMARKS   |
|-----------------------------------------|-------------------|--------------------------------|-------------------|-----------|
| MI16-224, PSU3,<br>OM16 & RMM           | 1                 | 224.500                        | ac powerline      | Pt 15.107 |
|                                         | 1                 | 224.500                        | radiated          | Pt 15.109 |
|                                         | 1                 | 224.500                        | conducted         | Pt 15.111 |
|                                         |                   |                                |                   |           |

2. Equipment category:

|                |     |
|----------------|-----|
| Single channel | [ ] |
| Two channel    | [ ] |
| Multi-channel  | [X] |

3. Supply voltages:

Vnom = +24Vdc, via 110Vac PSU

**Note:-** Vnom voltages are as stated above unless otherwise shown on the test report page.

4. Temperatures:

Tnom = [see test]

5. Maximum bit or pulse rate:

bps = 1000

6. Channel spacing:

|            |   |                                     |
|------------|---|-------------------------------------|
| kHz        | = | 25                                  |
| Narrowband |   | <input checked="" type="checkbox"/> |
| Wideband   |   | <input type="checkbox"/>            |

7. Frequency deviation or shift:

kHz = 5

## TESTS REQUIRED

### RECEIVER TESTS

|                                                                 |       |
|-----------------------------------------------------------------|-------|
| Receiver Spurious Emissions - Powerline - Part 15.107           | [X]   |
| Receiver Spurious Emissions - Radiated - Part 15.109            | [X]   |
| Receiver Spurious Emissions - Conducted - Part 15.111           | [X]   |
| Receiver Spurious Emissions - Radiated - Part 15.209.c - <30MHz | [n/a] |

#### Notes:-

- Equipment tested for (mains ac) 110V powerline emissions. [X]
- Equipment tested for (fixed) integral antenna configuration. [X]
- Equipment tested for (coaxial) conducted antenna configuration. [X]
- Equipment tested for radiated emissions as per Part 15.109.e {15.209.c}. [n/a]
- All tests were carried out with new batteries, as per Part 15.31.e. [n/a]

### SAMPLE CALCULATIONS

Part 15.107 - Powerline.

| Frequency (MHz) | Rx (dB $\mu$ V) | LISN Correction (dB) | Cable loss (dB) | Powerline (dB $\mu$ V) |
|-----------------|-----------------|----------------------|-----------------|------------------------|
| 1.485           | +32.6           | +0.1                 | +0.1            | +32.8                  |

Parts 15.109 & 15.209 - Radiated.

| Frequency (MHz) | Rx (dB $\mu$ V) | 3m Correction (dB) | Ae AF & Cable loss (dB/m & dB) | Field Strength @ 3m (dB $\mu$ V/m) |
|-----------------|-----------------|--------------------|--------------------------------|------------------------------------|
| 80.000          | +25.8           | n/a                | +7.8                           | +33.6                              |
| n/a             |                 |                    |                                |                                    |
| n/a             |                 |                    |                                |                                    |

Part 15.111 - Conducted.

| Frequency (MHz) | Rx (dBW) | Attenuator (dB) | Cable loss (dB) | Conducted (dBW) |
|-----------------|----------|-----------------|-----------------|-----------------|
| 1015.500        | -122.8   | n/a             | +1.0            | -121.8          |

## RECEIVER TESTS

### RECEIVER SPURIOUS EMISSIONS - POWERLINE - PART 15.107

|                     |   |         |                        |     |
|---------------------|---|---------|------------------------|-----|
| Ambient temperature | = | +17°C   | Class A digital device | [ ] |
| Relative humidity   | = | 62%     | Class B digital device | [X] |
| Conditions          | = | Indoors |                        |     |
| Supply voltage      | = | Vnom    |                        |     |
| Channel number      | = | 1       |                        |     |

|                                        |                   |                                                                                  |                                                                                         |
|----------------------------------------|-------------------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| Frequency & Level<br>450kHz to 1705kHz |                   | 0.488MHz<br>0.573MHz<br>0.695MHz<br>0.792MHz<br>0.965MHz<br>1.055MHz<br>1.485MHz | +28.2dBμV<br>+31.7dBμV<br>+31.0dBμV<br>+32.0dBμV<br>+29.3dBμV<br>+31.2dBμV<br>+32.8dBμV |
| Frequency & Level<br>1705kHz to 30MHz  |                   | 6.123MHz                                                                         | +28.6dBμV                                                                               |
| Limits                                 | 450kHz to 1705kHz | +60.0 dBμV [ ]; +48.0 dBμV [X]                                                   |                                                                                         |
|                                        | 1705kHz to 30MHz  | +69.5 dBμV [ ]; +48.0 dBμV [X]                                                   |                                                                                         |
| Measurement Uncertainty                |                   | ±4.0dB                                                                           |                                                                                         |

#### Notes:-

1. Receiver detector = CISPR, Quasi-Peak, 10kHz bandwidth.
2. Sample calculation, see page 6.

#### Test Method:-

1. As per Radio - Noise Emissions, ANSI C63.4: 1992.
2. EUT located 0.4m from wall of shielded room, 0.8m from LISN. & above the ground plane.
3. EUT emissions evaluated for live and neutral lines at power terminals of the ac mains supply.
4. EUT emissions evaluated with an ac mains supply frequency of 50Hz.
5. EUT emissions evaluated with an ac mains supply voltage of 110V.
6. Worst case results recorded and reported.

#### Test Equipment Used:-

1. Full description at Annex B.
2. TRL190, TRL191, TRL238, TRL12, TRL89, TRL237.

## RECEIVER TESTS

### RECEIVER SPURIOUS EMISSIONS - RADIATED - PART 15.109

|                     |   |                              |                        |     |
|---------------------|---|------------------------------|------------------------|-----|
| Ambient temperature | = | +10°C (<1GHz), +20°C (>1GHz) | Class A digital device | [ ] |
| Relative humidity   | = | 78% (<1GHz), 68% (>1GHz)     | Class B digital device | [X] |
| Conditions          | = | Open Area Test Site (OATS)   | 10m measurements <1GHz | [ ] |
| Supply voltage      | = | Vnom                         | 3m measurements <1GHz  | [X] |
| Channel number      | = | 1                            | 1m measurements >1GHz  | [X] |

|                                        |                   |                                                         |                                                                                                      |
|----------------------------------------|-------------------|---------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Frequency & Level<br>30MHz to 88MHz    |                   | 68.775MHz<br>75.250MHz<br>76.500MHz<br>80.000MHz        | +29.5dB $\mu$ V/m @ 3m<br>+32.9dB $\mu$ V/m @ 3m<br>+33.0dB $\mu$ V/m @ 3m<br>+33.6dB $\mu$ V/m @ 3m |
| Frequency & Level<br>88MHz to 216MHz   |                   | 112.650MHz                                              | +31.2dB $\mu$ V/m @ 3m                                                                               |
| Frequency & Level<br>216MHz to 960MHz  |                   | nil emissions                                           | >20dB below limit                                                                                    |
| Frequency & Level<br>960MHz to (x) MHz |                   | nil emissions                                           | >20dB below limit                                                                                    |
| Limits                                 | 30MHz to 88MHz    | +39.0dB $\mu$ V/m @ 10m [ ]; +40.0dB $\mu$ V/m @ 3m [X] |                                                                                                      |
|                                        | 88MHz to 216MHz   | +43.5dB $\mu$ V/m @ 10m [ ]; +43.5dB $\mu$ V/m @ 3m [X] |                                                                                                      |
|                                        | 216MHz to 960MHz  | +46.4dB $\mu$ V/m @ 10m [ ]; +46.0dB $\mu$ V/m @ 3m [X] |                                                                                                      |
|                                        | 960MHz to (x) MHz | +49.5dB $\mu$ V/m @ 10m [ ]; +54.0dB $\mu$ V/m @ 3m [X] |                                                                                                      |
| Measurement Uncertainty                |                   | $\pm 4.1$ dB                                            |                                                                                                      |

#### Notes:-

- Results quoted are extrapolated as indicated.
- Emissions were searched to:- (x) 2100MHz inclusive, as per Part 15.33b.
- Extrapolation factor @ 20dB/decade from 10m to 1m, as per Part 15.31f.
- Extrapolation factor @ 10.5dB from 10m to 3m.
- Extrapolation factor @ 9.5dB from 3m to 1m.
- Measurements <1GHz @ 10m (Class A), or @ 3m (Class B), as per Part 15.109.
- Measurements >1GHz @ 1m, as per Part 15.31f (1).
- Receiver Detector <1GHz = CISPR, Quasi-Peak, 120kHz Bandwidth.
- Receiver Detector >1GHz = Peak Hold, 1MHz Resolution Bandwidth.
- Sample calculation, see page 6.

#### Test Method:-

- As per Radio - Noise Emissions, ANSI C63.4: 1992.
- Measuring distances as Notes 1, 2 & 3 above.
- EUT 0.8 metre above ground plane.
- Emissions maximised by rotation of EUT, on an automatic turntable, raising and lowering the receiver antenna between 1m & 4m in horizontal and vertical polarisations, with worst case results recorded.

#### Test Equipment Used:-

- Full description at Annex B.
- TRL190, TRL191, TRL182, TRL415, TRL164, TRL193, TRL203, TRL138, TRL279.

## RECEIVER TESTS

### RECEIVER SPURIOUS EMISSIONS - CONDUCTED - PART 15.111

Ambient temperature = +21°C  
Relative humidity = 66%  
Conditions = Indoors  
Supply voltage = Vnom  
Channel number = 1 (RMM21 port)

|                                      |                                                                                                  |                                                                                                      |
|--------------------------------------|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Frequency & Level<br>9kHz to (x) MHz | 203.1MHz<br>406.2MHz<br>609.3MHz<br>812.4MHz<br>1015.5MHz<br>1421.7MHz<br>1624.8MHz<br>2031.0MHz | -135.3dBW<br>-126.8dBW<br>-135.8dBW<br>-127.7dBW<br>-128.6dBW<br>-132.3dBW<br>-111.5dBW<br>-124.9dBW |
| Limit                                | -87dBW (2nW)                                                                                     |                                                                                                      |
| Measurement Uncertainty              | ±1.5dB                                                                                           |                                                                                                      |

#### Notes:-

1. Emissions were searched to:- (x) 2100MHz inclusive, as per Part 15.33b.

#### Test Method:-

1. As per Radio - Noise Emissions, ANSI C63.4: 1992.
2. RF Spectrum Analyser set to:-
  - Res BW = 10kHz @ <30MHz.
  - Res BW = 100kHz @ <1GHz.
  - Res BW = 1MHz @ >1GHz.
  - Video BW = as per Res BW.
  - Detector = Peak Hold.
  - Freq. Span = as appropriate.
  - Scan Rate = Auto.
3. Measurement Receiver set to:-
  - Rx BW = 10kHz @ <30MHz.
  - Rx BW = 120kHz @ <1GHz.
  - Detector = CISPR, Quasi-Peak.

#### Test Equipment Used:-

1. Full description at Annex B.
2. TRL190, TRL191, TRL164, TRL55.

## RECEIVER TESTS

### RECEIVER SPURIOUS EMISSIONS - CONDUCTED - PART 15.111

Ambient temperature = +21°C  
Relative humidity = 66%  
Conditions = Indoors  
Supply voltage = Vnom  
Channel number = 1 (RMM22 port)

|                                      |                                                                                                                            |                                                                                                                                |
|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Frequency & Level<br>9kHz to (x) MHz | 203.1MHz<br>406.2MHz<br>609.3MHz<br>812.4MHz<br>1015.5MHz<br>1218.6MHz<br>1421.7MHz<br>1624.8MHz<br>1827.9MHz<br>2031.0MHz | -130.9dBW<br>-130.0dBW<br>-128.6dBW<br>-124.9dBW<br>-121.8dBW<br>-130.9dBW<br>-131.9dBW<br>-106.7dBW<br>-131.5dBW<br>-122.1dBW |
| Limit                                | -87dBW (2nW)                                                                                                               |                                                                                                                                |
| Measurement Uncertainty              | ±1.5dB                                                                                                                     |                                                                                                                                |

#### Notes:-

1. Emissions were searched to:- (x) 2100MHz inclusive, as per Part 15.33b.

#### Test Method:-

1. As per Radio - Noise Emissions, ANSI C63.4: 1992.
2. RF Spectrum Analyser set to:-
  - Res BW = 10kHz @ <30MHz.
  - Res BW = 100kHz @ <1GHz.
  - Res BW = 1MHz @ >1GHz.
  - Video BW = as per Res BW.
  - Detector = Peak Hold.
  - Freq. Span = as appropriate.
  - Scan Rate = Auto.
3. Measurement Receiver set to:-
  - Rx BW = 10kHz @ <30MHz.
  - Rx BW = 120kHz @ <1GHz.
  - Detector = CISPR, Quasi-Peak.

#### Test Equipment Used:-

1. Full description at Annex B.
2. TRL190, TRL191, TRL164, TRL55.

# ANNEX B

## TEST EQUIPMENT LIST

| INSTRUMENT                                     | SUPPLIER              | TYPE No            | SERIAL No    | TRL EMC No |
|------------------------------------------------|-----------------------|--------------------|--------------|------------|
| LF / HF RECEIVER,<br>9kHz - 30MHz              | ROHDE&SCHWARZ         | ESH2               | 879014 / 028 | TRL 06     |
| RF PULSE LIMITER                               | ROHDE&SCHWARZ         | ESH3Z2             | M494         | TRL 06A    |
| AE, LOOP, Z2,<br>9kHz - 30MHz                  | ROHDE&SCHWARZ         | HFH2               | 881058 - 53  | TRL 07     |
| RANGE 1 (3 - 30m)                              | TRL                   | N/A                | N/A          | TRL 08     |
| VARIAC, 230V, 10A                              | ZENITH                | 100R               | V265537      | TRL 12     |
| dc PSU, VARIABLE,<br>30v, 10A, 300W            | TOPWARD<br>ELECTRONIC | 23010              | 899672       | TRL 15     |
| RF SIGNAL GEN,<br>10kHz - 1000MHz              | MARCONI               | 2022               | 119022 / 205 | TRL 17     |
| LISN, ac MAINS                                 | CHASE                 | MN2050             | 1431         | TRL 25     |
| HF RECEIVER,<br>150kHz - 30MHz                 | CHASE                 | HFR2000            | 2158         | TRL 26     |
| LF RECEIVER,<br>9kHz - 150kHz                  | CHASE                 | LFR1000            | 1020         | TRL 27     |
| HF RECEIVER,<br>150kHz - 30MHz                 | CHASE                 | HFR2000            | 2187         | TRL 28     |
| AE, DIPOLE,<br>20MHz - 300MHz                  | CHASE                 | VHA9103            | 7106         | TRL 35     |
| AE, DIPOLE,<br>20MHz - 300MHz                  | CHASE                 | VHA9103            | 7011         | TRL 36     |
| AE, DIPOLE,<br>300MHz - 1GHz                   | CHASE                 | VHA9105            | 7107         | TRL 37     |
| AE, DIPOLE,<br>300MHz - 1GHz                   | CHASE                 | VHA9105            | N/A          | TRL 38     |
| ATU, RECEIVER,<br>9kHz - 30MHz                 | SCHWARZBECK           | FMZL1514           | 1514338      | TRL 42     |
| COAX LOAD, 2W,<br>N, 50Ω,<br>dc - 4GHz         | BIRD                  | 8360NM             | N/A          | TRL 113    |
| COAX LOAD, 2W,<br>N, 50Ω,<br>dc - 4GHz         | BIRD                  | 8360NM             | N/A          | TRL 114    |
| COAX LOAD, 2W,<br>BNC, 50Ω,<br>dc - 4GHz       | BIRD                  | 8360B              | N/A          | TRL 115    |
| COAX LOAD, 2W,<br>BNC, 50Ω,<br>dc - 4GHz       | BIRD                  | 8360B              | N/A          | TRL 116    |
| COAX LOAD, 1W,<br>BNC, 50Ω,<br>dc - 1GHz (min) | SUHNER                | 65BNC - 50 - 0 - 1 | N/A          | TRL 117    |
| AE, DRG HORN,<br>1GHz - 18GHz                  | EMCO                  | 3115               | 9010 - 3580  | TRL 138    |

# ANNEX B

## TEST EQUIPMENT LIST

| INSTRUMENT                                            | SUPPLIER    | TYPE No        | SERIAL No    | TRL EMC No |
|-------------------------------------------------------|-------------|----------------|--------------|------------|
| AE, DRG HORN,<br>1GHz - 18GHz                         | EMCO        | 3115           | 9010 - 3581  | TRL 139    |
| RF ANALYSER,<br>10kHz - 60GHz                         | TEKTRONIX   | 2756P          | B010109      | TRL 164    |
| MULTIMETER (mc)<br>20k $\Omega$ / V (sens)            | AVO         | MODEL 8, MK.V. | 0545248      | TRL 169    |
| RF SIGNAL GEN,<br>LOW NOISE -90dBc,<br>10kHz - 5.4GHz | MARCONI     | 2042           | 119388 / 080 | TRL 176    |
| RANGE 2 (3 - 10m)                                     | TRL         | N/A            | N/A          | TRL 182    |
| VARIAC, 230V, 10A                                     | VARATLAN    | Z710R          | N/A          | TRL 186    |
| ANTENNA MAST                                          | CHASE       | HM9104         | N/A          | TRL 189    |
| MULTIMETER (dig)                                      | ISOTECH     | IDM91          | 00606606     | TRL 190    |
| THERMOMETER<br>& HYGROMETER                           | RS          | 212 - 146      | N/A          | TRL 191    |
| AE, BICONE,<br>20MHz - 300MHz                         | CHASE       | BBA 9106       | N/A          | TRL 193    |
| SCOPE, 20MHz,<br>2CH, DIG STORAGE                     | BECKMAN     | 9302           | 2090044      | TRL 197    |
| AE, LOG PERIODIC,<br>300MHz - 1GHz                    | CHASE       | UPA6108        | 1061         | TRL 203    |
| ac PSU, VARIABLE,<br>300V, 5A, 1kVA,<br>45Hz - 440Hz  | MAGNUS      | MP500          | 1108         | TRL 204    |
| TRANSFORMER,<br>ISOLATION, 240Vac                     | RS          | 209 - 099      | N/A          | TRL 205    |
| TRANSFORMER,<br>ISOLATION, 110Vac                     | RS          | 208 - 636      | N/A          | TRL 206    |
| LISN, 3ph MAINS ac                                    | SCHWARZBECK | NSKL8128       | 8128151      | TRL 207    |
| COAX LOAD, 5W,<br>BNC, 50 $\Omega$ ,<br>dc - 4GHz     | BIRD        | 80BNCM         | 5866         | TRL 223    |
| dc PSU, VARIABLE,<br>15/30V, 2/1A, 30W                | WIER        | 731            | 88829        | TRL 224    |
| VARIAC, 230V, 2A                                      | REGULAC     | RB3 - MT       | N/A          | TRL 225    |
| VARIAC, 230V, 2A                                      | REGULAC     | RB3 - MT       | N/A          | TRL 226    |
| THERMOMETER<br>& HYGROMETER                           | RS          | 212 - 124      | 227          | TRL 227    |
| THERMOMETER<br>& HYGROMETER                           | RS          | 212 - 124      | 228          | TRL 228    |
| THERMOMETER<br>& HYGROMETER                           | RS          | 212 - 124      | 229          | TRL 229    |

## ANNEX B

### TEST EQUIPMENT LIST

| INSTRUMENT                                      | SUPPLIER        | TYPE No                     | SERIAL No    | TRL EMC No |
|-------------------------------------------------|-----------------|-----------------------------|--------------|------------|
| THERMOMETER & HYGROMETER                        | RS              | 212 - 124                   | 230          | TRL 230    |
| THERMOMETER & HYGROMETER                        | RS              | 212 - 124                   | 231          | TRL 231    |
| AE, LOG PERIODIC, 300MHz - 1GHz                 | EMCO            | 3146                        | N/A          | TRL 233    |
| dc PSU, VARIABLE, (2x) 32V, 3A, 100W            | THURLBY THANDAR | PL330                       | 046542       | TRL 235    |
| LF / HF RECEIVER, 9kHz - 30MHz                  | ROHDE&SCHWARZ   | ESHS20                      | 837960 / 003 | TRL 237    |
| LISN, ac MAINS                                  | ROHDE&SCHWARZ   | ESHS3 - Z5                  | 839135 / 013 | TRL 238    |
| MULTIMETER, (dig)                               | ISOTECH         | IDM97                       | 32202147     | TRL 239    |
| THERMOMETER & BAROMETER                         | RS              | 216435                      | N/A          | TRL 240    |
| COAX CABLE, 50Ω, 18GHz, TNC, 1.25m              | W L GORE        | 3390 / 265 / 1              | 8420202      | TRL 249    |
| COAX CABLE, 50Ω, 18GHz, TNC, 1.25m              | W L GORE        | 3390 / 265 / 1              | 8420223      | TRL 250    |
| AE, BICONE, 20MHz - 300MHz                      | CHASE           | VBA6106A                    | 1193         | TRL 251    |
| AE, EASY 1, 30MHz - 1GHz                        | FARNELL         | S30280                      | 017          | TRL 253    |
| RF SIGNAL GEN, LOW NOISE -90dBc, 10kHz - 5.4GHz | MARCONI         | 2042                        | 119562 / 021 | TRL 254    |
| SCOPE, 400MHz, 4CH, DIG STORAGE                 | TEKTRONIX       | TDS460A                     | B020781      | TRL 258    |
| RF SIGNAL GEN, 10kHz - 1GHz                     | MARCONI         | 2022D                       | 119224 - 023 | TRL 264    |
| MULTIMETER, (dig)                               | ISOTECH         | IDM97 RMS                   | 32202307     | TRL 273    |
| AE, BILOG, 20MHz - 2GHz                         | CHASE           | CBL6112                     | 2098         | TRL 274    |
| COAX ADAPTOR, 18GHz, TNC / N                    | ROSENBERGER     | 05S106 - K0053              | N/A          | TRL 275    |
| COAX ADAPTOR, 18GHz, TNC / N                    | ROSENBERGER     | 05S106 - K0053              | N/A          | TRL 276    |
| COAX ADAPTOR, 18GHz, TNC / N                    | ROSENBERGER     | 05S106 - K0053              | N/A          | TRL 277    |
| COAX ADAPTOR, 18GHz, TNC / N                    | ROSENBERGER     | 05S106 - K0053              | N/A          | TRL 278    |
| COAX CABLE, 18GHz, N, 0.5M                      | ROSENBERGER     | RTK161 - GP - Nm90 - 50cms  | N/A          | TRL 279    |
| COAX CABLE, 18GHz, N, 3.0M                      | ROSENBERGER     | RTK161 - GP - Nm90 - 300cms | N/A          | TRL 280    |

## ANNEX B

### TEST EQUIPMENT LIST

| INSTRUMENT                                              | SUPPLIER      | TYPE No      | SERIAL No     | TRL EMC No |
|---------------------------------------------------------|---------------|--------------|---------------|------------|
| COAX CABLE, 50Ω,<br>4GHz, N, 12m                        | TRL           | WESTFLEX 103 | N/A           | TRL 286    |
| COAX CABLE, 50Ω,<br>4GHz, N, 12m                        | TRL           | WESTFLEX 103 | N/A           | TRL 287    |
| LISN, ac MAINS                                          | ROHDE&SCHWARZ | ESH3 - Z5    | 837469 / 010  | TRL 289    |
| AE, BILOG,<br>20MHz - 1GHz                              | CHASE         | CBL6111B     | 1945          | TRL 290    |
| MULTIMETER (dig)                                        | ISOTECH       | IDM97 RMS    | 32202547      | TRL 291    |
| MULTIMETER (dig)                                        | ISOTECH       | IDM97 RMS    | 32202565      | TRL 292    |
| THERMOMETER<br>& BAROMETER                              | RS            | 216435       | N/A           | TRL 293    |
| COAX CABLE, 50Ω,<br>26.5GHz, SMA, 2m,<br>c/w 3 ADAPTORS | GORE          | 145          | MFR65474      | TRL 308    |
| V / UHF RECEIVER,<br>20MHz - 1GHz                       | ROHDE&SCHWARZ | ESVS10       | 837948 / 003  | TRL 317    |
| RF PULSE LIMITER                                        | ROHDE&SCHWARZ | ESH3Z2       | A400          | TRL 318    |
| RF SIGNAL GEN,<br>9kHz - 1.2GHz                         | MARCONI       | 2023         | 112224 / 036  | TRL 320    |
| AE, LOG PERIODIC,<br>300MHz - 1GHz                      | CHASE         | UPA6108      | 1016          | TRL 344    |
| V / UHF RECEIVER,<br>20MHz - 1GHz                       | ROHDE&SCHWARZ | ESVS10       | 844594 / 0003 | TRL 352    |
| LF / HF RECEIVER,<br>9kHz - 30MHz                       | ROHDE&SCHWARZ | ESHS10       | 844077 / 019  | TRL 353    |
| COAX CABLE, 50Ω,<br>4GHz, N, 0.5m                       | TRL           | NA           | NA            | TRL 358    |
| COAX CABLE, 50Ω,<br>4GHz, N, 16m                        | TRL           | NA           | NA            | TRL 359    |
| COAX CABLE, 50Ω,<br>4GHz, N, 1m                         | TRL           | NA           | NA            | TRL 360    |
| THERMOMETER<br>& HYGROMETER                             | RS            | 204 - 072    | NA            | TRL 363    |
| THERMOMETER<br>& HYGROMETER                             | RS            | 204 - 072    | NA            | TRL 364    |
| THERMOMETER<br>& HYGROMETER                             | RS            | 204 - 072    | NA            | TRL 365    |
| THERMOMETER<br>& HYGROMETER                             | RS            | 204 - 072    | NA            | TRL 366    |
| V / UHF RECEIVER,<br>20MHz - 1GHz                       | ROHDE&SCHWARZ | ESVS20       | 838804 / 005  | TRL 415    |
| RF ANALYSER,<br>9kHz - 1GHz                             | WAYNE KERR    | SSA1000A     | 9800001488    | TRL 416    |

**ANNEX B****TEST EQUIPMENT LIST**

| <b>INSTRUMENT</b>                 | <b>SUPPLIER</b> | <b>TYPE No</b> | <b>SERIAL No</b> | <b>TRL EMC No</b> |
|-----------------------------------|-----------------|----------------|------------------|-------------------|
| LF / HF RECEIVER,<br>9kHz - 30MHz | ROHDE&SCHWARZ   | ESHS10         | 830051 / 001     | TRLUH 03          |
| AE, LOOP, Z2,<br>9kHz - 30MHz     | ROHDE&SCHWARZ   | HFH - Z2       | 892246 / 023     | TRLUH 23          |
| RF ANALYSER,<br>dc - 26.5GHz      | MARCONI         | 2380           | 152089 / 009     | TRLUH 120         |
|                                   |                 | 2386           | 152076 / 044     |                   |

## ANNEX C

### APPLICANT'S SUBMISSION OF DOCUMENTATION LIST

|    |                                            |                                              |                                                                                                                   |
|----|--------------------------------------------|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| a. | FEDERAL COMMUNICATIONS COMMISSION          | - APPLICATION<br>- FEE                       | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>                                        |
| b. | AGENT'S LETTER OF AUTHORISATION            |                                              | <input checked="" type="checkbox"/>                                                                               |
| c. | QUESTIONNAIRE                              |                                              | <input checked="" type="checkbox"/>                                                                               |
| d. | TRADE NAME DECLARATION(s)                  |                                              | <input type="checkbox"/>                                                                                          |
| e. | LABELLING                                  | - PHOTOGRAPHS<br>- DECLARATION<br>- DRAWINGS | <input type="checkbox"/><br><input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>            |
| f. | TECHNICAL DESCRIPTION                      |                                              | <input checked="" type="checkbox"/>                                                                               |
| g. | BLOCK DIAGRAMS                             | - Rx<br>- PSU<br>- AUX                       | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/><br><input checked="" type="checkbox"/> |
| h. | CIRCUIT DIAGRAMS                           | - Rx<br>- PSU<br>- AUX                       | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/><br><input checked="" type="checkbox"/> |
| i. | COMPONENT LOCATION                         | - Rx<br>- PSU<br>- AUX                       | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/><br><input checked="" type="checkbox"/> |
| j. | PCB TRACK LAYOUT                           | - Rx<br>- PSU<br>- AUX                       | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/><br><input checked="" type="checkbox"/> |
| k. | BILL OF MATERIALS                          | - Rx<br>- PSU<br>- AUX                       | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/><br><input checked="" type="checkbox"/> |
| l. | USER INSTALLATION / OPERATING INSTRUCTIONS |                                              | <input checked="" type="checkbox"/>                                                                               |