TEST REPORT
FROM
RADIO FREQUENCY
INVESTIGATION LTD.

Test Of: Raymarine Ltd.
4D Light Marine Radome Radar Scanner
To: FCC Part 80: 1998 and FCC Part 2: 1998

Test Report Serial No:
RFI/MICB2/RP42589JD01A**A**

Supersedes Test Report Serial No:
RFI/MICB1/RP42589JD01

This Test Report Is Issued Under The Authority Of Richard Jacklin, Operations Director: 	**Checked By:** 
Tested By: 	**Release Version No: PDF01**
Issue Date: 11 October 2001	**Test Dates: 22 August to 24 August 2001** **29 August to 30 August 2001** **13 September 2001**

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1. Client Information

Company Name:	Raymarine Ltd.
Address:	Anchorage Park Portsmouth Hants PO3 5TD
Contact Name:	Mr C Bird

2. Equipment Under Test (EUT)

The following information (with the exception of the Date of Receipt) has been supplied by the client:

2.1. Identification Of Equipment Under Test (EUT)

Brand Name:	Raymarine
Model Name or Number:	4D
Unique Type Identification:	M92652
Serial Number:	None Stated by Client
Country of Manufacture:	UK
FCC ID Number:	PJ5MTX4-8P
Date of Receipt:	22 August 2001

2.2. Description Of EUT

The EUT is a light marine raydome scanner unit with a 4kW peak power transmitter and a 24 inch antenna. The scanner unit can be connected to one of a series of display unit variants. The display unit used during the testing contained in this test report was a RL80CRC 10 inch colour LCD display.
The radar system designation is RL84CRC PLUS.

2.3. Modifications Incorporated In EUT

Preliminary radiated field strength measurements resulted in a modification that will be incorporated in all 4D radar scanner units. The modification consists of a screening can containing RAM being placed around the magnetron.

2.4. Additional Information Related To Testing

Power Supply Requirement:	12V DC Supply
Intended Operating Environment:	Leisure marine and workboats
Weight:	10.5 kg
Dimensions:	700 mm diameter x 200 mm height
Interface Ports:	13-pin scanner 3-pin DC power 3-pin SeaTalk data; 3-pin hsb^2 (high speed bus) 4-pin NMEA OUT

2.5. Support Equipment

The following support equipment was used to exercise the EUT during testing:

Description:	10” Colour LCD Radar/Chart Display Unit
Brand Name:	Raymarine
Model Name or Number:	RL80CRC PLUS
Serial Number:	None Stated by Client
FCC ID Number:	None
Cable Length And Type:	Dedicated 15 meter Cable
Connected to Port:	Dedicated Port

3. Test Specification, Methods & Procedures

3.1. Test Specification

Reference:	FCC Part 80 Subpart E: 1998 and FCC Part 2: 1998
Title:	Code of Federal Regulations, Part 80 (47CFR): 1998 Stations in the maritime services Subpart E: General Technical Standards Code of Federal Regulations, Part 2 (47CFR): 1998 Frequency Allocations and radio treaty matters; general rules and regulations
Comments:	A description of the test facility used for this test is on file with, and has been accepted by, the Federal Communications Commission as required by Section 2.948 of Federal Rules.
Purpose of Test:	To determine whether the equipment complied with the requirements of the specification for the purposes of verification.

3.2. Methods And Procedures

The methods and procedures used were as detailed in:

ANSI C63.2 (1987)
Title: American National Standard for Instrumentation - Electromagnetic noise and field strength.

ANSI C63.4 (1992)
Title: American National Standard Methods of Measurement of Electromagnetic Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

ANSI C63.5 (1988)
Title: American National Standard for the Calibration of antennas used for Radiated Emission measurements in Electromagnetic Interference (EMI) control.

ANSI C63.7 (1988)
Title: American National Standard Guide for Construction of Open Area Test Sites for performing Radiated Emission Measurements.

CISPR 16 (1987)
Title: Specification for Radio Interference measuring apparatus and measurement methods.

3.3. Definition Of Measurement Equipment

The measurement equipment used complied with the requirements of the standards referenced in the Methods & Procedures section above. Appendix 1 contains a list of the test equipment used.

4. Deviations From The Test Specification

2.1047(d) Modulation characteristics – *Other types of equipment*. No curves supplied.

5. Operation Of The EUT During Testing

5.1. Operating Conditions

The EUT was tested in the following operating modes:

9kHz to 40GHz: The EUT was located in a covered turntable site on the 3m open area test site environment for radiated emissions.

The EUT was located in a laboratory environment for all other tests.

During testing, the EUT was powered by a Nominal 12V dc supply.

5.2. Operating Modes

The EUT was tested in the following operating modes:

Radiated emissions: Transmitting into a non-reflective load with the transmitter set to a 450ns pulse width, 1.5kHz PRF. In the frequency band near the assigned frequency band the transmitter was also set to pulse widths of 65ns and 1000ns.

This mode was defined by the client as being likely to be the worst case with regards to EMC.

Variation of transmit frequency with voltage and temperature: The transmitter was set to the half nautical mile range and the six nautical mile range, 65ns and 1000ns pulse width.

For other testing, the pulse widths were: 65ns (0.25 mile range), 90ns (0.5 mile range), 150ns (0.75 mile range), 250ns (0.75 mile range expanded), 350ns (1.5 mile range), 450ns (3 mile range), 600ns (3 mile range expanded), 1000ns (6 mile range).

5.3. Configuration And Peripherals

The EUT was tested in the following configuration:

The Scanner Unit was connected to the Display Unit with cable of a standard 15 m length. A dummy load was connected to the Scanner Unit antenna port. All Display Unit interface ports were connected via dummy loads. A 12 V DC supply was connected to the Display Unit.

This mode was defined by the client as being likely to be the worst case with regards to emissions.

Appendix 1 of this report contains a full list of test equipment used and Appendix 2 contains a schematic diagram of the test configuration.

6. Summary Of Test Results

6.1. Summary Of Tests

6.1.1. Radiated Spurious Emissions

Frequency Range	Specification Reference	Compliance Status
9kHz to 40GHz	80.211(f) and 2.1053	Complied

6.1.2.. Conducted Spurious Emissions

Frequency Range	Specification Reference	Compliance Status
9kHz to 40GHz	80.211(f) and 2.1051	Complied

6.1.3. RF Power Output

6.1.3.1. Peak Power

Nominal Pulse Width Range (ns)	Specification Reference	Compliance Status
65 to 1000	80.215(a) and 2.1046(a)	Complied

6.1.3.2. Average Power

Nominal Pulse Width Range (ns)	Specification Reference	Compliance Status
65 to 1000	80.215(a) and 2.1046(a)	Complied

6.1.3.3. Pulse Width

Nominal Pulse Width Range (ns)	Specification Reference	Compliance Status
65 to 1000	80.215(a) and 2.1046(a)	Complied

6.1.3.4. PRF

Pulse Repartition Frequency (KHz)	Specification Reference	Compliance Status
3.0 to 0.74	80.213(g) and 2.1047(d)	Complied

6.1.4. Variation of Frequency with Voltage

6.1.4.1.. 65ns

Nominal Pulse Width (ns)	Specification Reference	Compliance Status
65	2.1055 (d)	Complied

6.1.4.2.. 1000ns

Nominal Pulse Width (ns)	Specification Reference	Compliance Status
1000	2.1055 (d)	Complied

6.1.5.Variation of Frequency with Temperature

6.1.5.1.. 65ns

Nominal Pulse Width (ns)	Specification Reference	Compliance Status
65	2.1055(a and b)	Complied

6.1.5.2. 1000ns

Nominal Pulse Width (ns)	Specification Reference	Compliance Status
1000	2.1055(a and b)	Complied

6.1.6.. Occupied Bandwidth

Nominal Pulse Width Range (ns)	Specification Reference	Compliance Status
65 to 1000	2.1049(i) and 80.205(a)	Complied

6.1.7.Transmitter Frequency Tolerance

Nominal Pulse Width Range (ns)	Specification Reference	Compliance Status
65 to 1000	80.209(b)	Complied

6.1.8.Suppression of Interference Aboard Ships

80.217. When the radar is in standby mode of operation, the local oscillator is automatically switched off.

6.2. Location Of Tests

All the measurements described in this report were performed at the premises of Radio Frequency Investigation Ltd, Ewhurst Park, Ramsdell, Basingstoke, Hampshire, RG26 5RQ, England.

7. Measurements, Examinations And Derived Results

7.1. General Comments

7.1.1. This section contains test results only. Details of the test methods and procedures can be found in Appendix 2 of this report.

7.1.2. The measurement uncertainties stated were calculated in accordance with the requirements of NAMAS Document NIS 81 with a confidence level of 95%. Please refer to Section 8 for details of measurement uncertainties.

7.1.3. The client declared the highest clock frequency of the EUT as 9.41GHz. Consequently, the tests were performed up to 40GHz.

7.2. Field Strength Measurements

7.2.1. Magnetic Field Strength Measurements (Frequency Range: 9kHz to 30MHz)

7.2.1.1.. Please refer to Appendix 4 of this test report for graphical results.

7.2.1.2.The following table lists frequencies at which emissions were measured using a Quasi-Peak detector (The results incorporate antenna factors and cable losses):

Frequency (MHz)	Ant. Pol.	Q-P Level (dBmV/m)	Limit (dBmV/m)	Margin (dB)	Result
0.097	90°	68.3	103.5	35.2	Complied
0.197	90°	57.2	103.5	46.3	Complied

7.2.2. Electric Field Strength Measurements (Frequency Range: 30MHz to 1GHz)

7.2.2.1.. Please refer to Appendix 4 of this test report for graphical results.

7.2.2.2.. The following table lists frequencies at which emissions were measured using a Quasi-Peak detector (The results incorporate antenna factors and cable losses):

Frequency (MHz)	Ant. Pol.	Q-P Level (dBmV/m)	Limit (dBmV/m)	Margin (dB)	Result
45.831	V	50.9	103.5	52.6	Complied
379.200	H	39.2	103.5	64.3	Complied
382.400	H	38.5	103.5	65.0	Complied
546.200	H	41.2	103.5	62.3	Complied
557.000	H	42.2	103.5	61.3	Complied
579.660	H	52.6	103.5	50.9	Complied

7.2.3. Electric Field Strength Measurements (Frequency Range: 1GHz to 40GHz)

7.2.3.1. The client declared the highest clock frequency of the EUT as 9.41GHz. Consequently, the tests were performed up to 40GHz.

7.2.3.2. Please refer to Appendix 4 of this test report for graphical results.

7.2.3.3. The following tables list frequencies at which emissions were measured using Peak detector functions. (The results incorporate antenna factors and cable losses):

Highest Peak Level:

Frequency Span Range (GHz)	Actual Peak Level (dBmV/m)	Peak Limit (dBmV/m)	Margin (dB)	Result
1.0 to 2.0	<71.2	103.5	32.3	Complied
2.0 to 4.0	<71.6	103.5	31.9	Complied
4.0 to 6.0	<66.0	103.5	37.5	Complied
6.0 to 8.0	<76.2	103.5	27.3	Complied
8.0 to 12.5	<98.8	103.5	4.7	Complied
12.5 to 18.0	<81.2	103.5	22.3	Complied
18.0 to 26.5	<100.5	103.5	3.0	Complied
26.5 to 33.0	<94.0	103.5	9.5	Complied
33.0 to 40.0	<98.5	103.5	5.0	Complied

7.3. Conducted Emissions

7.3.1. Peak Detector Measurements On RF port

7.3.1.1. Please refer to Appendix 4 of this test report for graphical results.

7.3.1.2. The following table lists frequencies at which emissions or the highest noise floor were measured using a Peak detector:

Frequency (GHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
6 to 8.910	-19.2	-13.0	6.2	Complied
8.910 to 9.210	-3.0	28.3	31.3	Complied
9.210 to 9.310	-1.3	38.3	39.6	Complied
9.510 to 9.610	0.1	38.3	38.2	Complied
9.610 to 9.910	-8.3	28.3	36.6	Complied
9.910 to 26.5	-27.4	-13.0	14.4	Complied
26.5 to 40.0	-20.0	-13.0	7.0	Complied

Note 1: Due to the use of waveguide WR90 at the antenna port of the EUT which has a cut-off frequency of 6.57GHz, the lower frequency of measurement was increased to 6.0GHz

7.3.2. Average Power Summary.

Nominal Pulse Width (ns)	Measured Peak Power (W)	Measured P.R.F (kHz)	Measured Pulse Width (ns)	Calculated Average Power (Watts)
65	2128	3.030	64.271	0.414
90	2679	3.030	90.220	0.732
150	2979	3.030	151.697	1.369
250	3622	3.030	247.505	2.716
350	3622	2.016	355.289	2.594
450	3622	1.497	447.106	2.424
600	3631	1.309	594.810	2.827
1000	3639	0.740	1049.900	2.827

Note 1: The following sub sections detail the results required to make the above calculation.

Note 2: Example of calculation used to derive the Calculated Average Power.
Peak Power(Watts) X Pulse Width(Seconds) X PRF(Hz). = Average Power(Watts).
Eg. $2128 \times 3030 \times 64.271^{-9} = 0.414$

7.3.3. Peak Power

7.3.3.1. These measurements were performed with the HP Power Analyser and sensor connected to the EUT via a coupler, in line Attenuator and microwave coax cable.

Pulse Width (ns)	Measured Power (dBm)	Corrected Power, Peak (kW)
65	63.28	2.128
90	64.28	2.679
150	64.74	2.979
250	65.30	3.622
350	65.44	3.622
450	65.59	3.622
600	65.60	3.631
1000	65.61	3.639

Note 1: The power at the shorter pulse widths has been deliberately reduced to enhance radar performance.

7.3.4. Pulse Width

7.3.4.1. Please refer to Appendix 4 of this test report for graphical results.

7.3.4.2. In order to determine the characteristics of the various pulses, a power analyser was connected, through a HP detector and an attenuator to the test set up.

Nominal Pulse Width (ns)	Measured Pulse Width (ns)
65	64.271
90	90.220
150	151.697
250	247.505
350	355.289
450	447.106
600	594.810
1000	1049.900

7.3.5. PRF

7.3.5.1. Please refer to Appendix 4 of this test report for graphical results.

7.3.5.2. In order to determine the characteristics of the various pulses, a power analyser was connected, through a HP detector and an attenuator to the test set up.

Pulse Width (ns)	**Measured P.R.F. (KHz)**
65, 90 & 150	3.030
250	3.030
350	2.016
450	1.497
600	1.309
1000	0.740

7.4. Variation of frequency with Voltage

7.4.1. Please refer to Appendix 4 of this test report for graphical results.

7.4.2. The frequency of the EUT was measured at each voltage.

7.4.3. The equipment can be operated from 12 or 24 Volts sources without requiring any changes. Therefore the testing was performed at 85 % of the lowest to 115 % of the highest operating Voltage

65ns

% of nominal Volts	Volts (dc)	Measured frequency (MHz)	Deviation from 9410 MHz (MHz)
85 (12V)	10.2	9411.7	+1.7
100 (12V)	12.0	9413.3	+3.3
100 (24V)	24.0	9412.0	+2.0
115 (24V)	27.6	9411.7	+1.7

1000ns

% of nominal Volts	Volts (dc)	Measured frequency (MHz)	Deviation from 9410 MHz (MHz)
85 (12V)	10.2	9410.0	0.0
100 (12V)	12.0	9410.0	0.0
100 (24V)	24.0	9410.4	+0.4
115 (24V)	27.6	9410.6	+0.6

Note 1: The Battery End Point is 10.2 Volts.

7.5. Variation of frequency with Temperature

7.5.1. The EUT was situated in an environmental test chamber. Initially the EUT remained off. The chamber was set to –20 °C. After a minimum of 30 minutes the EUT was turned on and allowed to stabilise until there was no measurable frequency change. The frequency was recorded. The EUT was then switched off, and the chamber temperature stepped up by 10 °C. This process was repeated until the EUT was at + 50 °C.

60ns Pulse

Temperature °C	Measured frequency (MHz)	Deviation from 9410 MHz (MHz)
-20	9423.1	+13.1
-10	9421.7	+11.7
0	9420.4	+10.4
+10	9417.8	+7.8
+20	9416.6	+6.6
+30	9412.7	+2.7
+40	9410.7	+0.7
+50	9409.6	-0.4

1000ns Pulse

Temperature °C	Measured frequency (MHz)	Deviation from 9410 MHz (MHz)
-20	9421.7	+11.7
-10	9420.6	+10.6
0	9418.7	+8.7
+10	9416.7	+6.7
+20	9414.5	+4.5
+30	9412.5	+2.5
+40	9410.6	+0.6
+50	9409.4	-0.6

7.6. Occupied Bandwidth

7.6.1. Please refer to Appendix 4 of this test report for graphical results.

7.6.2.The 99.5% power bandwidth was measured for each pulse mode using the special function option on the spectrum analyser.

Nominal Pulse Width (ns)	99.5% Power Bandwidth (MHz)
65	80.020
90	56.953
150	34.286
250	25.353
350	18.864
450	14.764
600	12.031
1000	10.275

7.7. Transmitter Frequency Tolerance

7.7.1.Specification: *80.209 (b) – "When pulse modulation is used in land and ship radar stations operating in the bands above 2.4GHz the frequency at which maximum emission occurs must be within the authorised bandwidth and must not be closer than **1.5/T MHz** to the upper and lower limits of the authorised bandwidth where "T" is the pulse duration in microseconds."*

7.7.2.Calculation

Authorised Bandwidth: 9300MHz to 9500MHz

Specification Limits **[Lower]** 9300 + 1.5/T
[Upper] 9500 - 1.5/T

Transmitter Frequency Tolerances
FCC ID PJ5MTX4-8P

Nominal Pulse Width (ns)	Actual Pulse Width (µs)	Specification Limits (MHz)	
		Lower	Upper
65	0.064271	9323.34	9476.66
90	0.090220	9316.63	9483.37
150	0.151697	9309.89	9490.11
250	0.247505	9306.06	9493.94
350	0.355289	9304.22	9495.78
450	0.447106	9303.35	9496.65
600	0.594810	9302.52	9497.48
1000	1.049900	9301.43	9498.57

From examining the transmitter frequency data from Variation of Frequency with Voltage and Variation of Frequency with Temperature results pages, it can be seen that the transmitter is within the calculated specification.

8. Measurement Uncertainty

8.1. Company Policy, as based on the NAMAS Accreditation Standard, M10, paragraph 12.11 (o), states that Test Reports shall include estimated uncertainty of the calibration or test result (this information need only appear in test reports and test certificates where it is relevant to the validity or application of the test result, where a client's instructions so require or where uncertainty affects compliance to a specification or limit).

8.2. The global uncertainties have been calculated in accordance with NAMAS NIS 81 (Edition 1, May 1994) as follows:

Measurement Type	Range	Confidence Level	Calculated Uncertainty
Conducted Power	1 GHz to 40 GHz	95%	+/- 0.5 dB
Frequency Accuracy	N/A	95%	+/- 0.8 ppm
Radiated Emissions at 3.0 metres	30 MHz to 1000 MHz	95%	+/- 5.26 dB
Radiated Emissions at 10.0 metres	30 MHz to 1000 MHz	95%	+/- 5.1 dB
Radiated Emissions	1 GHz to 40 GHz	95%	+/- 4.18 dB

8.3. Measurement uncertainties have been applied in accordance with NAMAS document NIS 81 (edition 1, May 1994), and in the absence of any specification criteria, guidance, or code of practice, compliance has been judged on the basis of shared risk.

8.4. In the case of emissions tests, the measured value of the disturbance from the product sample shall be compared directly with the limits. If the measured value is equal to or less than the limit the product is deemed to pass the test.

8.5. In the case of immunity tests, the equipment is deemed to pass the test if it fulfils the stated performance criteria at the required or a higher severity level. The measurement uncertainty has been taken into account in the calibration procedures stated in the relevant basic standard.

8.6. The methods used to calculate the above uncertainties are in line with those used for calibration laboratories contained in NAMAS document NIS 3003 Edition 8 “The Expression of Uncertainty and Confidence in Measurement” May 1995, which align with international recommendations “Guide to the Expression of Uncertainty in Measurement” ISO/IEC/OIML/BIPM (Prepared by ISO/TAG 4: January 1993).

Appendix 1. Test Equipment Used

RFI No.	Instrument	Maker	Type No.	Serial No.
A007	HFH2-Z2 Loop Antenna	Rohde & Schwarz	HFH2-Z2	880 458/020
A008	HFH2-Z2 Metal Tripod	Rohde & Schwarz	HFU-Z	None
A027	Horn Antenna	Eaton	9188-2	301
A031	2 to 4 GHz Eaton Horn Antenna	Eaton	91889-2	557
A1037	Chase Bilog Antenna	Chase EMC Ltd	CBL6112B	2413
A164	Mains Charger / Battery	RFI Ltd Basingstoke	NONE	NONE
A197	Site 2 Controller SC144	Unknown	SC144	150720
A201	WG 20 Horn Antenna	Flann Microwave Ltd	20240-20	266
A203	WG 22 Horn Antenna	Flann Microwave Ltd	22240-20	343
A251	20 dB Attenuator	Narda	766-20	None
A253	WG 12 Microwave Horn	Flann Microwave	12240-20	128
A254	WG 14 Microwave Horn	Flann Microwave	14240-20	139
A255	WG 16 Microwave Horn	Flann Microwave	16240-20	519
A256	WG 18 Microwave Horn	Flann Microwave	18240-20	400
A259	Bilog Antenna	Chase	CBL6111	1513
A430	WG 18 horn	Flann	18240-20	425
A435	WG 22 horn	Flann	22240-20	400
A436	WG 20 horn	Flann	20240-20	330
C1024	Rosenberger Cable	Rosenberger	FA210A-1-020m	FA00B 7565
C1025	Rosenberger Cable	Rosenberger	FA210A-1-020m	FA00B 7564
C563	C563-N-2	Rosenberger	UFA 210A-1-0787-70x70	96L0225

Test Equipment Continued

RFI No.	Instrument	Maker	Type No.	Serial No.
E009	Environmental Chamber	Thermotron Corporation	S-8-E Mini Max	25-2407-0
G085	Generator	Hewlett Packard	83650L	3614A00104
L0604	Peak Power Analyser	Hewlett Packard	8991A	3248A00128
M069	ESMI Spectrum Analyser / Receiver	Rohde & Schwarz	ESMI	829 808/007 (DU) / 827 063/008 (RU)
M090	Receiver / Spectrum Analyser System	Rohde & Schwarz	ESBI	DU:838494/005 RU:836833/001
M105	Fluke 77 DVM	Fluke	77	963580770
M114	Temperature/Humidity Meter	RS Components	212-146	None
M116	Temperature/Humidity Meter	RS Components	212-146	None
M150	Power Sensor	Boonton	51072	28473
M151	Power Meter	Boonton	4220	D207602BL
M295	HP 8564E	Hewlett Packard	8564E	3846A01561
S505	PSU	Weir	4000	964214/164

NB In accordance with UKAS requirements, all the measurement equipment is on a calibration schedule.

Please Note: All equipment supplied by the client ("L0*x*" in the above table) was fully checked by Radio Frequency Investigation Ltd. personnel prior to use.

Appendix 2. Measurement Methods

A2.1. Radiated Emissions [9 kHz to 1 GHz]

A2.1.1. Radiated emissions measurements were performed in accordance with the standard, against appropriate limits for a Peak detector.

A2.1.2. Initial measurements covering the entire measurement band in the form of swept scans in a shielded enclosure were performed in order to identify frequencies on which the EUT was generating interference. This determined the frequencies on which the EUT should be re-measured in full on the open area test site. In order to minimise the time taken for the swept measurements, a Peak detector was used in conjunction with the appropriate detector IF measuring bandwidth (see table below). Repetitive scans were performed to allow for emissions with low repetition rates, and for the duty cycle of the EUT. The test configuration was the same for the initial scans as for the final measurements.

A2.1.3. The initial scans were performed using an antenna height of 1.5 m and a measurement distance of 3 m. Following the initial scans, graphs were produced giving an overview of the emissions from the EUT plotted against the appropriate specification limit. A tolerance line was set 20 dB below the specification limit and levels above the tolerance line were re-tested on the open area test site, at the appropriate distance, using a measuring receiver with a Peak detector.

A2.1.4. For the main (final) measurements the EUT was arranged on a non-conducting table on an open area test site, as detailed in the specification.

A2.1.5. All measurements on the open area test site were performed using broadband antennas.

A2.1.6. On the open area test site, at each frequency where a signal was found, the levels were maximised by initially rotating the turntable through 360° and then varying the antenna height between 1 m and 4 m. At this point, any signals found to be between the limit and a level 6 dB below it were further maximised by changing the configuration of the EUT, e.g. re-routing cables to peripherals and moving peripherals with respect to the EUT.

A2.2. Radiated Emissions [1 GHz to 95 GHz]

A2.2.1 Calculating Radiated Emissions Limit Line

A2.2.1. In defining the 103.5dBuV/m limit for the product, it was placed on the open area test site table with the measuring equipment located at a distance of three metres.

A2.2.2. The open array antenna was fitted as representative of normal operation and the magnetron disconnected. The magnetron was replaced with a waveguide to coaxial adaptor and connected to a signal generator.

A2.2.3. The signal generator was unable to reproduce the actual peak power output of the intentional radiator – measured as 3.639kW by conducted methods. Consequently, a level of 3.639mW was reproduced at the antenna port and the level on the spectrum analyser offset by +60dB.

A2.2.4. The non-reflective load was then connected to the transmitter system and the substitution measurement performed.

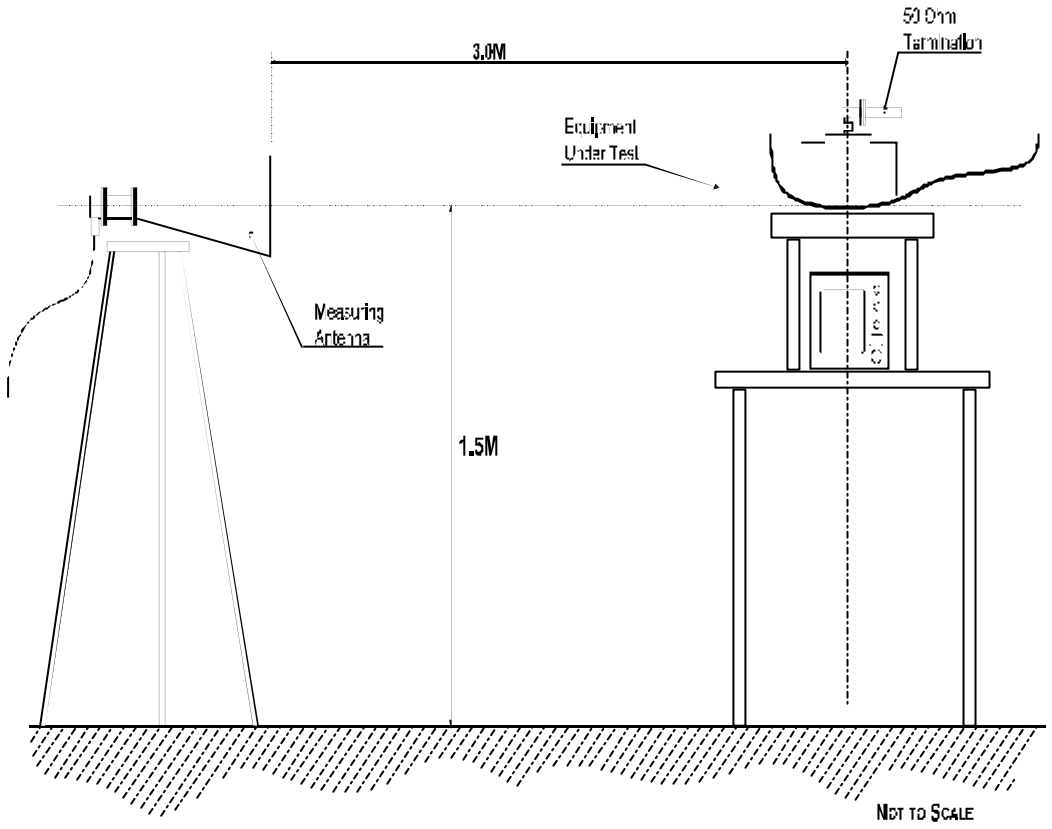
Appendix 3. Test Configuration Drawings

This appendix contains the following drawings:

Drawing Reference Number	Title
DRG\42589\EMIRAD	Test configuration for measurement of radiated electric field
DRG\42589\001	Schematic of EUT and associated components for all conducted measurements

DRG\42589\EMIRAD

Test Configuration for Radiated Emissions Measurements



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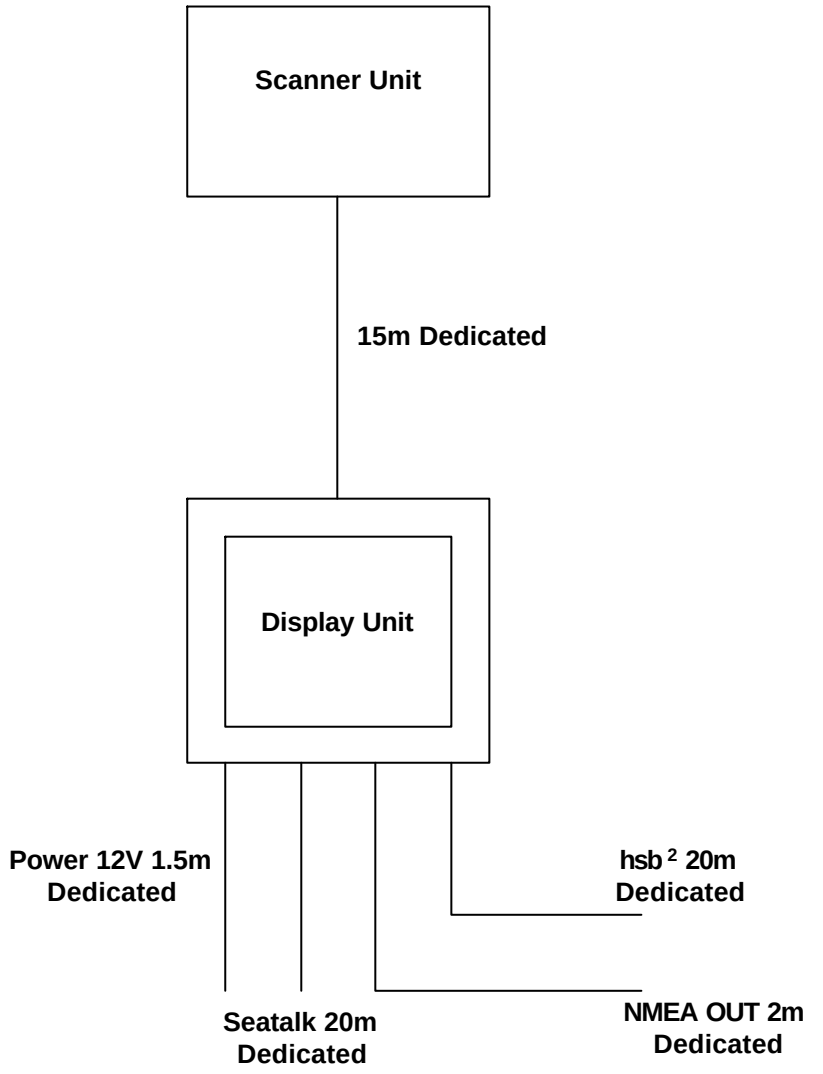
Configuration of EUT and Local Support Equipment



N.B For all tests the antenna will be replaced by a dummy load.
For some tests the antenna/dummy load rotation will be inhibited.

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