telefication bv
The Netherlands
Chamber of Commerce
09076358
www.telefication.com

telefication

Safety test report
98747650

based on:
EN 60215

Maritime VHF-radiotelephone with integrated class D DSC controller and channel 70 watchkeeping receiver

McMurdo/Pains Wessex
F1 DSC

Contents

This report comprises of three modules. The total number of pages is: 28

Main module

1 Introduction

This report contains the result of tests performed by:

Telefication bv
Utrechtseweg 310
6812 AR ARNHEM
The Netherlands

Telefication complies with the accreditation criteria for laboratories as described in the STERLAB criteria which contains all of the criteria from EN 45001 and ISO/IEC guide 25 and the relevant criteria from ISO 9001. The accreditation covers the quality system of the laboratory as well as the specified activities described in the accreditation certificate bearing the accreditation number L021 and is granted on 30 November 1990 by the Dutch Council For Accreditation (RvA: Raad voor Accreditatie). An extended procedure for performing tests outside their permanent premises has been accepted by the board of STERLAB for accreditation. Telefication is thereby allowed to conduct tests on any suitable site by regular Telefication staff, using suitable equipment that is property of Telefication or of a second party.

Ordering party:

Company name	:	McMurdo Ltd.
Address	:	Silver Point, Airport service Road
Zipcode	:	PO3 5PB
City/town	:	Portsmouth
Country	:	United Kingdom
Date of order	:	14 October 2001

2 Product

A sample of the following product was submitted for testing:

General

Product category	:	Maritime VHF-radiotelephone with integrated class D DSC controller and channel 70 watchkeeping receiver
Manufacturer	:	McMurdo Ltd.
Trade mark	:	McMurdo/Pains Wessex
Type designation	:	F1 DSC
Hardware version	:	--
Software release	:	--
Serial number	:	--

Ratings and Principal Characteristics

Rated voltage	:	12 Vdc
Rated current	:	--
Rated frequency	:	--
Rated temperature	:	-15 to +55 °C
Mass of equipment	:	2170 g
Equipment mobility	:	Stationary
Operation conditions	:	Continuous
Class of equipment	:	Class III
Connection to supply	:	Battery

Product Variants:

None

3 Test schedule

Tests were carried out in accordance with the specification detailed in chapter 7 "Summary" of this report.

Tests were carried out at the following location:
- Telefication, Arnhem

The sample of the product was received on:
- 14 December 2001

Tests were carried out from:
- 14 December 2001 to 27 May 2002

4 Product documentation

For production of this report the following product documentation was used:

Description	Date	Identification
User manual	07/12/01	F1 VHF Radio with DSC, draft
Control board layout	rev. 1, 01-07-02 rev. 2, 01-09-12	Part name: DSC VHF A&C board
Control board schematic	rev. 1, 01-04-17 rev. 2, 01-06-25 rev. 3, 01-08-29 rev. 4, 01-09-24	Part name: DSC VHF Audio & control module
RF board layout	rev. 1, 00-12-20 rev. 2, 01-05-02 rev. 3, 01-07-02 rev. 4, 01-09-12	Part name: DSC VHF RF board
RF board schematic	rev. 1, 00-10-30 rev. 2, 00-12-19 rev. 3, 01-04-27 rev. 4, 01-06-26 rev. 5, 01-08-29 rev. 6, 01-09-24	Part name: DSC VHF RF module

The above mentioned documentation will be filed at Telefication for a period of 10 years following the issue of this report.

5 Observations and comments

Record of marginal test measurements

The test results obtained did not contain any marginal measurements.

Clearances and Creepage Distances

Unless otherwise stated all clearance and creepage distance measurements were subject to the limits required for Pollution Degree 2 and Material group IIIb.

6 Modifications to the sample

The device is equiped with an external fuseholder. This fuseholder was not marked with a fuse-rating, as required in clause 8.4. A marking is now placed on this fuseholder (see photograph 6, page 27).

All connectors on the rear were fixed on the enclosure (see photograph 5, page 26, before modification and photograph 7, page 28, after modification).

7 Summary

The product is intended for use in the following application area:

Marine Radio Equipment

The sample was tested according to the following specifications:

- IEC 215: Third Edition 1987 incorporating Amendment 1 (1989) and Amendment 2 (1993-05)
- EN 60215: 1989 A1, A2

8 Conclusions

The sample of the product showed **NO NON-COMPLIANCES** to the specifications stated in chapter 7 of this report.

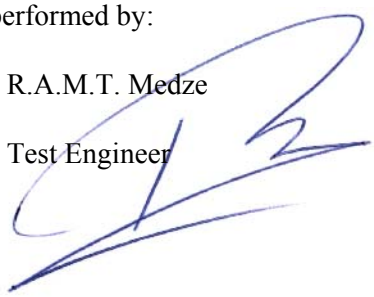
The results of the tests as stated in this report, are exclusively applicable to the product item as identified in this report. Telefication does not accept any responsibility for the results stated in this report, with respect to the properties of product items not involved in these tests.

All tests are performed by:

name : R.A.M.T. Medze

function : Test Engineer

signature :

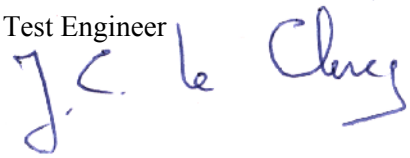


Review of test methods and report by:

name : ing. J.C. le Clercq

function : Test Engineer

signature :



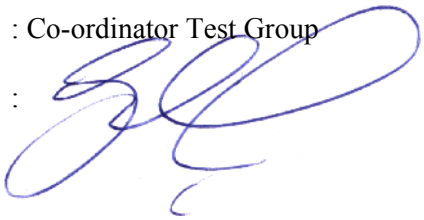
The above conclusions have been verified by the following signatory:

date : 29 May 2002

name : J.P. van de Poll

function : Co-ordinator Test Group

signature :



Test results module

1 General

All tests were performed under the following environment conditions:

- Temperature range : 15 – 25 °C
- Humidity range : 46 – 74 %
- Pressure range : 86 – 106 kPa

Explanation for abbreviations of the result column:

- C = Conform
- NC = Not Conform
- NA = Not Applicable
- NT = Not Tested

2 Summary of tests

Clause	Requirements	Remark	Result			
			C	NC	NA	NT
	SECTION THREE					
7	Introduction					
8	Components		✓			
9	Construction		✓			
10	Markings relevant to safety		✓			
	SECTION FOUR					
11	Introduction					
12	Earthing				✓	
13	Enclosures		✓			
14	Mechanical considerations concerning safety devices				✓	
15	Wiring		✓			
16	Insulation				✓	
17	Voltages at the radio-frequency output				✓	
	SECTION FIVE					
18	Introduction					
19	High temperatures		✓			
20	Fire		✓			
21	Implosion and explosion				✓	
22	Harmful radiation		✓			
23	Dangerous materials				✓	
24	Dangerous short-circuiting of low voltage supplies				✓	

Test result forms

SECTION THREE COMPONENTS CONSTRUCTION						
Clause	**Requirement**	**Remark**	**Result**			
			C	**NC**	**NA**	**NT**
7	**Introduction**					
8	**Components**					
8.1	General requirements		✓			
8.2	Connectors					
	a) Design		✓			
	b) Construction		✓			
	c) Clearance and creepage				✓	
	d) Non detachable cord or cable				✓	
8.3	Switches		✓			
8.4	Fuse links		✓			
8.5	Parts subject to corrosion				✓	
8.6	Solid state switched and contactors (under consideration)					
8.7	Photocouplers (under consideration)					
8.8	Fibre optics (under consideration)					
9	**Construction**					
9.1	General requirements					
	a) Constructed of non-flammable materials		✓			
	b) Slackness of electrical connections		✓			
	c) Moving parts				✓	
	d) Remote control				✓	
	e) Mechanical design		✓			
	f) Minimisation of acoustic noise		✓			
9.2	Resistance to humidity				✓	
9.3	Restistance to ingress of water				✓	
9.4	Housing of batteries				✓	

Clause	Requirement	Remark	Result			
			C	NC	NA	NT
10	**Markings relevant to safety**					
	a) Legible and discernible markings		✓			
	b) Language of markings				✓	
	c) Marking of switches and isolators				✓	
	d) Warning against harmful radiation				✓	

SECTION FOUR PROTECTION AGAINST HARMFUL ELECTRICAL SHOCK AND FREQUENCY SKIN BURNS						
Clause	**Requirement**	**Remark**	**Result**			
			C	**NC**	**NA**	**NT**
11	**Introduction**					
12	**Earthing**					
12.1	Safety earth terminal				✓	
	a) Equipment to be connected to fixed wiring				✓	
	b) Equipment provided with a non-detachable flexible cord or cable				✓	
	c) Equipment provided with a mains supply connector				✓	
	d) Misuse of safety terminals and contacts				✓	
12.2	Safety earth connections					
	a) Means used for assembling				✓	
	b) Other usage of safety earth connections				✓	
13	**Enclosures**					
13.1	Safety devices relating enclosures					
	a) Opening of doors and coverplates				✓	
	b) Safety devices forming part of the equipment				✓	
	c) Coupling between safety mechanism and access locking				✓	
	d) Reapplication of dangerous voltages				✓	
	e) Preventing of doors being closed				✓	
13.2	Voltages remaining on the equipment					
	a) Electrical safety				✓	
	b) Non-accessible voltages less than 354 V peak		✓			
13.3	Additional provisions					
	a) Earthing wands as an additional safety measure				✓	
	b) Design of the equipment				✓	

Clause	Requirement	Remark	Result			
			C	NC	NA	NT
14	**Mechanical considerations concerning safety devices**					
	a) Accordance with the “fail-safe” principle				✓	
	b) No possibility of false indication of safety				✓	
	c) Transition from “safe” to “unsafe” position				✓	
	d) Disabling a safety device by hand				✓	
	e) Withstanding of mishandling in practice				✓	
	f) Construction of safety earthing switches				✓	
	g) Reliably fixed handles, knobs, etc…				✓	
	h) Accessibility for inspection and maintenance				✓	
15	**Wiring**					
	a) Adequate protection against risk of mechanical damage		✓			
	b) Protection from possible contact		✓			
	c) Terminating arrangement for flexible cables		✓			
16	**Insulation**					
	a) Non-tracking and non-flammable insulating material				✓	
	b) Smaller creepage distances				✓	
17	**Voltages at the radio-frequency output connection**					
	a) Unintentional approach				✓	
	b) Drain off charges to earth				✓	

SECTION FIVE HIGH TEMPERATURES, FIRE AND MISCELLANEOUS HAZARDS						
Clause	**Requirement**	**Remark**	**Result**			
			C	**NC**	**NA**	**NT**
18	**Introduction**					
19	**High temperatures**					
19.1	Permissible temperature rise under conditions of normal use		✓			
19.2	Temperature rise under fault conditions		✓			
20	**Fire**		✓			
21	**Implosion and explosion**					
21.1	General requirements				✓	
21.2	Implosion				✓	
21.3	Explosion				✓	
22	**Harmful radiation**					
22.1	Non-ionizing radiation, including electromagnetic fields		✓			
22.2	Ionizing radiation				✓	
22.3	General requirements concerning radioactive materials				✓	
23	**Dangerous materials**				✓	
24	**Dangerous short-circuiting of low voltage supplies**				✓	

3 Tables

TABLE: List of critical components					
Object/Part No.	**Manufacturer/ Trademark**	**Type/Model**	**Technical data**	**Standard**	**Mark(s) of conformity [1])**
F3	Littelfuse	SMD	10 A	--	--
External fuse	Littelfuse	5 x 20 mm	250 V / 8 A	--	--

[1]) an asterisk indicates a mark which assures the agreed level of surveillance

TABLE: Electrical data (normal conditions)			
U (Vdc)	**I rated (A)**	**I measured (A)**	**Condition/Status**
12	--	475 mA	Idle mode
12	--	4,55 A	Transmitting mode

TABLE: Clearance and creepage distance measurements						
Clearance cl and creepage cr						

TABLE: Temperature rise measurements			
	Test voltage (V)	--	
	Tamb (°C)	--	
	T2 (°C)	--	
Temperature rise dT of part/at:			

	TABLE: Resistance to fire			
Item	**Material/Type**	**Manufacturer**	**Flammability class**	**UL File No.**
Main PCB	1	Elprint A/S, Bergen, Norway	94V-0	E172917
Radio front panel, microphone casing, microphone cable gland	Cycoloy, C1100	GE Plastics Europe, Bergen op Zoom, The Netherlands	HB	E45329

TABLE: Fault condition tests						
		Tamb (°C)				
		Model/type of power supply				
		Manufacturer of power supply				
		Rated markings of power supply				
No.						
S/C = Short Circuit O/C = Open Circuit						

Photographs module

List of Photographs

Photograph 1: - Overview

Photograph 2: - Frontview

Photograph 3: - Topview PCB

Photograph 4: - Interior

Photograph 5: - Rearview with connectors (before modification)

Photograph 6: - Modification, marking added on fuseholder

Photograph 7: - Modification, connectors fixed on enclosure