REPORT ON

Limited Type Approval Testing of the SML Technologies GAS6059
in accordance with ETSI EN 300 152 V1.2.1 (1999-10)

Report Number RM900741 January 2001

BABT PRODUCT SERVICE

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REPORT ON Limited Type Approval Testing of the SML Technologies GAS6059 in accordance with ETSI EN 300 152 V1.2.1 (1999-10)

Report No. RM900741

PREPARED FOR

SML Technologies
16 Brunel Way
Segensworth East
Fareham
Hampshire
PO15 5TX

APPROVED BY

M JENKINS
Radio Department Manager

DISTRIBUTION

SML Technologies	Mr M Macias	Copy No. 1
SML Technologies	Technical Construction File	Copy No. 2
BABT Product Service Limited		Copy No. 3

Copy No:

1377
1377S1

CONTENTS:-

For copyright details see page 30 of 30

Manufacturer:	SML Technologies
Type Designation:	GAS6059
Serial No.:	-
Number of Samples Tested:	One
Test Specification:	ETSI EN 300 152 V1.2.1 (1999-10)
Date of Receipt of Test Sample:	17th December 2000
Start of Test:	18th December 2000
Finish of Test:	10th January 2001
Test Engineer(s):	S BENNETT

TEST HOUSE DECLARATION

We, BABT Product Service Limited of Segensworth Road, Fareham, Hampshire PO15 5RH, declare under our sole responsibility that the product :

Equipment :	Wrist worn Personal Locator Beacon
Type/Model :	GAS6059
Serial Number :	-
Quantity :	One

to which this declaration relates is in conformity with the following standard(s) or other normative document(s) :

Limited ETSI EN 300 152 V1.2.1 (1999-10)
Clauses 8.1, 8.5 and 8.6

Detailed results are recorded in Report No. RM900741

Place and date of issue : Fareham, January 2001

Signature : 

M JENKINS
Radio Department Manager

Date : 26th January 2001

The equipment fully meets the essential requirements under Article 3.2 of the R & TTE Directive as defined in ETSI EN 300 152-2 V1.1.1 (2000-08)

APPLICANT'S DETAILS	
CATEGORY OF APPLICANT (please tick relevant box opposite)	(a) [✓] MANUFACTURER
	(b) [ ] IMPORTER
If box (b), (c) or (d) is ticked complete details in box below with respect to the manufacturer	(c) [ ] DISTRIBUTOR
	(d) [ ] AGENT
COMPANY NAME :	SML Technologies
ADDRESS :	16 Brunel Way Segensworth East Fareham Hampshire PO15 5TY
NAME FOR CONTACT PURPOSES :	Mr M Macias, Glen Cheadle
TELEPHONE NO :	FAX NO : 01789 557374
	EMAIL :

MANUFACTURERS DETAILS	
COMPANY NAME :	Same as above.
ADDRESS :	
NAME FOR CONTACT PURPOSES :	
TELEPHONE NO :	FAX NO :
	EMAIL :

TYPE DESIGNATION[1]
The type designation may be either a single alphanumeric code or an alphanumeric/code divided into two parts. lease fill in EITHER : TYPE DESIGNATION AS A SINGLE ALPHANUMERIC CODE / G / A / S / 6 / 0 / 5 / 9 / / / / / / OR : TYPE DESIGNATION IN TWO PARTS : 1. EQUIPMENT SERIES NO.[2] ("MODEL NUMBER") / / / / / / / / / / / / / / / / / / AND 2. EQUIPMENT SPECIFIC NO.[3] ("IDENTIFICATION NO") / / / / / / / / / / / / / / / / / /

(1) This is the manufacturer's numeric or alphanumeric code or name that is specific to a particular equipment. It may contain information in coded form on the characteristics of the equipment e.g. frequency, power. The manufacturer is free to choose the form of the type designation.

(2) This is the number, code or trade name used by the manufacturer to describe a series or 'family' of equipment of substantially the same mechanical and electrical construction which will include a number of related equipments. This number is often referred to as the "model number".

(3) This is the manufacturer's identification number given to a specific equipment in the series or ' family' of equipments. It is often referred to as the "identification number".

TECHNICAL VARIANTS	
IDENTIFICATION	**COMMENTS**
GAS6060	121.65 MHz version for instructional purposes.

EQUIPMENT CLASSIFICATION		
[ ]	Base Station	(Equipment fitted with an antenna socket for use with an external antenna, and intended for use in a fixed location).
[ ]	Mobile Station	(Mobile equipment fitted with an antenna socket, for use with an external antenna, normally used in a vehicle or as a transportable station).
[ ]	Handportable	(fitted with an antenna socket).
[ ]		(without an external antenna socket integral antenna equipment, but fitted with a permanent internal or a temporary internal 50 ohm R.F. connector which allows access to the transmitter output and the receiver input).
[✓]	Other	Wrist worn personal locator beacon.

BASE STATION			
[ ]	Transmitter	[ ]	Simplex
[ ]	Receiver	[ ]	Duplex
[ ]	Transceiver	[ ]	Communal Site Use (70 dB Intemod limit)

MOBILE STATION	
[ ]	Transmitter
[ ]	Receiver
[ ]	Transceiver
[ ]	Remote Control Head

HANDPORTABLE			
[ ]	Transmitter	[ ]	Battery Charger
[ ]	Receiver	[ ]	Duplex
[ ]	Transceiver		

TRANSMITTER TECHNICAL CHARACTERISTICS
TRANSMITTER FREQUENCY
Method of frequency generation [ ] CRYSTAL [ ] SYNTHESIZER [✓] OTHER (PLL) Integrated VCO, Phase detector, prescaler and reference oscillator transistor.
TRANSMITTER CHANNEL SWITCHING FREQUENCY RANGE 121.5 MHz Single Frequency TRANSMITTER FREQUENCY ALIGNMENT RANGE 121.5 MHz Single Frequency

TRANSMITTER RF POWER CHARACTERISTICS	
MAXIMUM RATED TRANSMITTER OUTPUT POWER as stated by manufacturer W AT TRANSMITTER RF OUTPUT CONNECTOR (as declared by manufacturer) 3 μW EFFECTIVE RADIATED POWER (FOR EQUIPMENT WITH INTEGRAL ANTENNA)	
Is transmitter intended for: Continuous duty [✓] Yes - Once it is operational [ ] No Intermittent duty [ ] Yes [✓] No If intermittent state DUTY CYCLE Transmitter ON minutes Transmitter OFF minutes	
Is transmitter output power variable?	
Yes [ ]	No [✓]
[ ] continuously variable [ ] stepped dB per step maximum RF output power (Watts) minimum RF output power (Watts)	Maximum power 3 μW

TRANSMITTER - MODULATION
[ ] Angle (FREQUENCY)
[ ] Phase
[✓] Other Details: A3X

TRANSMITTER MODULATION INPUT CHARACTERISTICS				
Modulation input signal level for 60% of maximum deviation at Hz at :				
Microphone socket	mV	Impedance	Ohms	
Accessory socket	mV	Impedance	Ohms	
Other (4)	mV	Impedance	Ohms	
Lowest audio modulation frequency transmitted by the equipment				
650 Hz (Approx)				

(4) For use where direct connection is provided for test purposes.

RECEIVER TECHNICAL CHARACTERISTICS - N/A
RECEIVER - FREQUENCY
METHOD OF FREQUENCY GENERATION [ ] CRYSTAL [ ] SYNTHESIZER [ ] OTHER INTERMEDIATE FREQUENCIES [ ] 1st [ ] 2nd [ ] 3rd
Is local oscillator injection frequency higher or lower than the receiver nominal frequency? [ ] Higher [ ] Lower
RECEIVER CHANNEL SWITCHING FREQUENCY RANGE RECEIVER FREQUENCY ALIGNMENT RANGE

RECEIVER AUDIO (AF) CHARACTERISTICS - N/A
MAXIMUM RATED AUDIO (AF) FREQUENCY OUTPUT POWER
INTO LOUDSPEAKER Watts
TO LINE Watts
INTO EARPIECE Watts
BALANCED [ ] YES
[ ] NO
UNBALANCED [ ] YES
[ ] NO
Does connection carry DC voltage?
[ ] YES
[ ] NO
If yes, state value V
Normal Audio load impedance
AT LOUDSPEAKER ohms
AT EARPIECE ohms
AT LINE OUTPUT ohms
At audio accessory connection or facility socket (if fitted)
Output Watts
Impedance ohms
Max input level at audio accessory socket
mV
Impedance ohms

TRANSMITTER AND RECEIVER CHARACTERISTICS
ITU DESIGNATION OR CLASS OF EMISSION 1K60A3X
CHANNEL SEPARATION Single Channel
State the maximum number of channels over which the equipment can operate One

EXTREME TEMPERATURE RANGE over which equipment is to be type tested
[ ] -25°C to +55°C
[ ] -15 to +55°C
[ ] -10°C to +55°C
[ ] 0°C to +40°C
[✓] OTHER -20°C to +55°C

CONSTRUCTION OF EQUIPMENT
[✓] Single unit (5)
[ ] Multiple units
If multiple units describe each one clearly :

(5) Unit means a physically separate item of the equipment.

AUTOMATIC EQUIPMENT SWITCH OFF
If the equipment is designed to automatically switch off at a predetermined voltage level which is higher or lower in value than the battery minimum and minimum calculated values this shall be clearly stated.
[✓] Applies 2.2 V Cut-off voltage
[ ] Does not apply

POWER SOURCE	
[ ] AC MAINS State voltage	[ ] Single phase
AC MAINS FREQUENCY (Hz)	[ ] Three phase
DC Voltage (V)	
DC Maximum Current (A)	
[ ] Other	
BATTERY	
[ ] Nickel Cadmium	
[ ] Mercury	
[ ] Alkaline	
[ ] Lead acid (Vehicle regulated)	
[ ] Leclanche	
[✓] Lithium	
[ ] Other	
Volts nominal 3 V. End point voltage as quoted by equipment manufacturer V.	

SIGNALLING	
Is selective signalling fitted	[ ] Yes
	[ ] No
Is selective signalling	
Analogue	[ ]
Digital	[ ]
If analogue, state format	
Tone Frequencies	
If digital, state modulation method :	
	bit rate

DUPLEX OPERATION

Is the equipment intended for

Duplex operation [ ] Yes

[ ] No

Is the equipment fitted with separate transmitter and receiver antenna sockets [ ] Yes

[ ] No

Is the equipment fitted with a duplex filter as an integral part of the equipment with a single antenna [ ] Yes

[ ] No

Is the duplex filter externally fitted and connected to the main equipment by co-axial cable(s)

[ ] Yes

[ ] No

Type and make of duplex filter:

COMMUNAL SITE OPERATION (1)

Is the equipment fitted with circulators/isolators, internally or externally, as part of the equipment, to achieve the 70 dB limit for communal site operations?

[ ] Yes

[ ] No

If YES, what is the value of attenuation of the circulator/isolator?

..... dB

ALIGNMENT RANGE

The definition of the alignment range AR1 and AR2 are given in Sub Clauses 3.1.2 and 3.1.3 of the Standard. The applicant should ensure that the sample equipment(s) submitted are operational on the appropriate channel(s) as given in Sub Clauses 3.1.5 through to 3.1.11 and tick the appropriate box.

	3.1.5	One sample single channel equipment of category AR1	[✓]
or	3.1.6	Three samples of single channel equipments of category AR2	[ ]
or	3.1.7	One sample two channel equipment of category AR1	[ ]
or	3.1.8	Three samples of two channel equipment of category AR2	[ ]
or	3.1.9	One sample multichannel equipment of category AR1	[ ]
or	3.1.10	Three samples of multichannel equipment of category AR2	[ ]
or	3.1.11	One sample of multichannel equipment of category AR2 where the switching range equals the alignment range	[ ]

If more than one option of the equipment is being submitted with different Type Designations, one or three samples, as appropriate, of each version shall be submitted.

CHANNEL IDENTIFICATION

Each equipment, whether one or more submitted for tests shall carry clear identification (such as a serial number), together with the frequencies associated with the channel identification displayed on the equipment.

Equipment Identification eg Serial Number	Channel No.	Transmit Nominal Freq MHz	Receive Nominal Freq MHz
GAS6059		121.5 MHz	N/A

OTHER ITEMS SUPPLIED		
Spare batteries e.g. (portable equipment)	[✓]	Yes
	[ ]	No
Battery charging device	[ ]	Yes
	[✓]	No
Special tools for dismantling equipment	[ ]	Yes
	[✓]	No
Encoder	[ ]	Yes
	[✓]	No
Test interface box (if applicable) or where appropriate the RF test fixture	[✓]	Yes
	[ ]	No
Full documentation on equipment (Handbook and circuit diagrams)	[✓]	Yes
	[ ]	No
Others	[ ]	Yes
	[✓]	No
If Yes, please specify :		

DECLARATION		
Are the equipments submitted representative production models?	[✓]	Yes
	[ ]	No
If not are the equipments pre-production models?	[ ]	Yes
	[ ]	No
If pre-production equipments are submitted will the final production equipments be identical in all respects with the equipment tested	[ ]	Yes
	[ ]	No
If no supply full details:		

I hereby declare that I am entitled to sign on behalf of the applicant and that the information supplied is correct and complete.

Signature : Held on file at BABT Product Service Limited

Name : Mr M Macias

Position held : Design Engineer

Date : 13th December 2000

BABT Product Service Limited formally certifies that the manufacturer's declaration as typed out in this report, is a true and accurate record of the original received from the applicant.

ADDITIONAL INFORMATION

The following table is an extract from ETSI EN 300 152-2 V1.1.1 (2000-08) Annex A:

EN Requirements Table (EN-RT)

EN Reference		EN 300152-2				Comment
No.	**Reference**	**EN-R (Note)**	**Status**			
1	4.2.1	Frequency error	M			PASS
2	4.2.2	Spurious emissions	M			PASS
3	4.2.3	Radiation produced by operation of the test facility	M			PASS
NOTE: These EN-Rs are justified under Article 3.2 of the R & TTE Directive						

Key to columns:

No Table entry number;

Reference Subclause reference number of conformance requirement within the present document;

EN-R Title of conformance requirement within the present document;

Status Status of the entry as follows;

M Mandatory, shall be implemented under all circumstances;

O Optional may be provided, but if provided shall be implemented in accordance with the requirements;

O.n This status is used for mutally exclusive or selectable options among a set. The integer "n" shall refer to a unique group of options within the EN-RT. A footnote to the EN-RT shall explicitly state what the requirement is for each numbered group. For example, "It is mandatory to support at least one of these options", or, "It is mandatory to support exactly one of these options".

Comments To be completed as required.

Ambient Temperature.....23°C Relative Humidity.....38%

FREQUENCY ERROR CLAUSE 8.1

TEST CONDITIONS		FREQUENCY ERROR (kHz)		
			121.500 MHz	
T_{nom}(+18°C)	V_{nom}(3.0 V DC)		+0.264	
T_{min}(-20°C)	V_{min}(2.26 V DC)		+1.600	
	V_{max}(3.2 V DC)		+1.600	
T_{max}(55°C)	V_{min}(2.26 V DC)		-1.607	
	V_{max}(3.2 V DC)		-1.608	
Maximum freq. Error (Hz)			+1600, -1608	
Measurement uncertainty (Hz)		±11		

LIMIT CLAUSE 8.1.3

FREQUENCY (MHz)	LIMIT (kHz)
121.500	± 3.5
243.000	± 7.0

TEST EQUIPMENT USED
1, 2, 3, 4, 5, 13, 14, 15, 16
.....

Ambient Temperature.....20°C Relative Humidity.....26%

RADIATION PRODUCED BY OPERATION OF THE TEST FACILITY CLAUSE 8.5

FREQUENCY (MHz)	EMISSION LEVEL (nW)
121.500	5.81
Measurement uncertainty (dB)	±1.45

LIMIT CLAUSE 8.5.3

Limit	≤ 25 nW

Remarks

No other emissions were detected at a level greater than 10 dB below the limit.

TEST EQUIPMENT USED:
2, 6, 7, 8, 9, 10, 11, 12
.....

Ambient Temperature.....21°C Relative Humidity.....45%

SPURIOUS EMISSIONS CLAUSE 8.6

FREQUENCY (MHz)	EMISSION LEVEL (µW)
Measurement uncertainty (dB)	±1.45

LIMIT CLAUSE 8.6.3

Limit	≤ 25 nW

Remarks

No emissions were detected at a level greater than 10 dB below the limit.

TEST EQUIPMENT USED:
8, 11, 12, 17, 18, 19
.....

TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

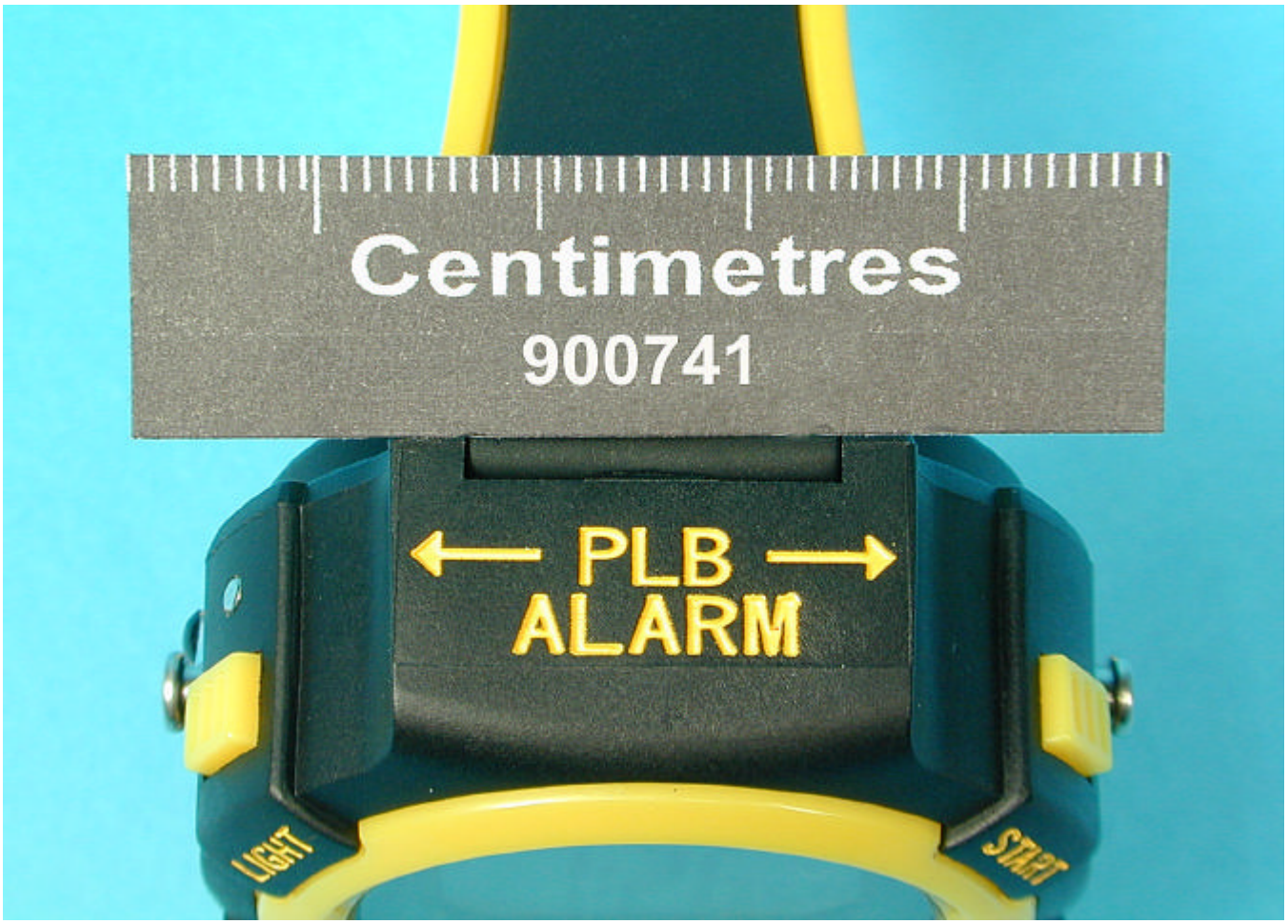
To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory.

No	Instrument/Ancillary	Type	Manufacturer	Serial No.
1	DC Power Supply	6253A	Hewlett Packard	2412A06566
2	RMS Multimeter	79III	Fluke	74730810
3	Thermohygrograph	I-1000	Rotronic	1826-15
4	Frequency Counter	53181A	Hewlett Packard	KR9120300
5	Cable	N-N Type	TÜV	CS0508
6	Analyser RF Unit	FSB-RF	Rohde & Schwarz	860 001/018
7	Signal Generator	ESG-4000A	Hewlett Packard	GB37040125
8	Biconical Antenna	BCH-2030/A	Antenna Research	102
9	Biconical Antenna	SAS200540	AH Systems	521
10	Cable	1m N-N	TÜV	CS0237
11	Thermohygrograph	A1	Rotronic	8859018
12	Power Supply Unit	60/25	Farnell	000971
13	Power Supply Unit	E30-2B	Wayne Kerr	001607
14	Digital Multimeter	8050A	Fluke	4940010
15	Hygromer	Series 1-1000	Rotronic	1826/14
16	Environmental Chamber	2F3	Montford	3090-K5467
17	Spectrum Analyser	8566A	Hewlett Packard	2349A03049
18	RMS Multimeter	79III	Fluke	74970620
19	Log Periodic Antenna	3146	EMCO	9607-4580

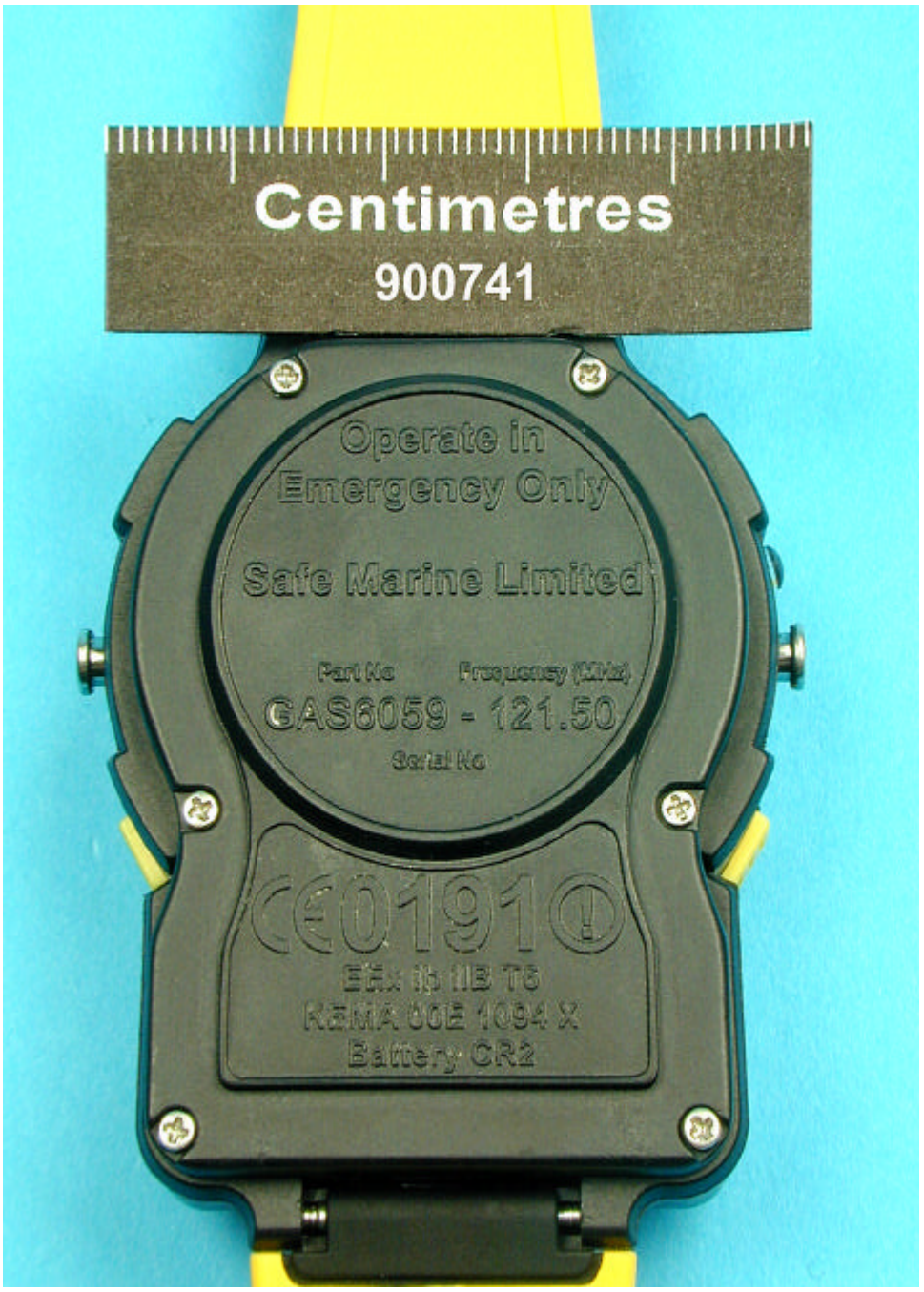
Front View

Front - Close Up

Side View No. 1

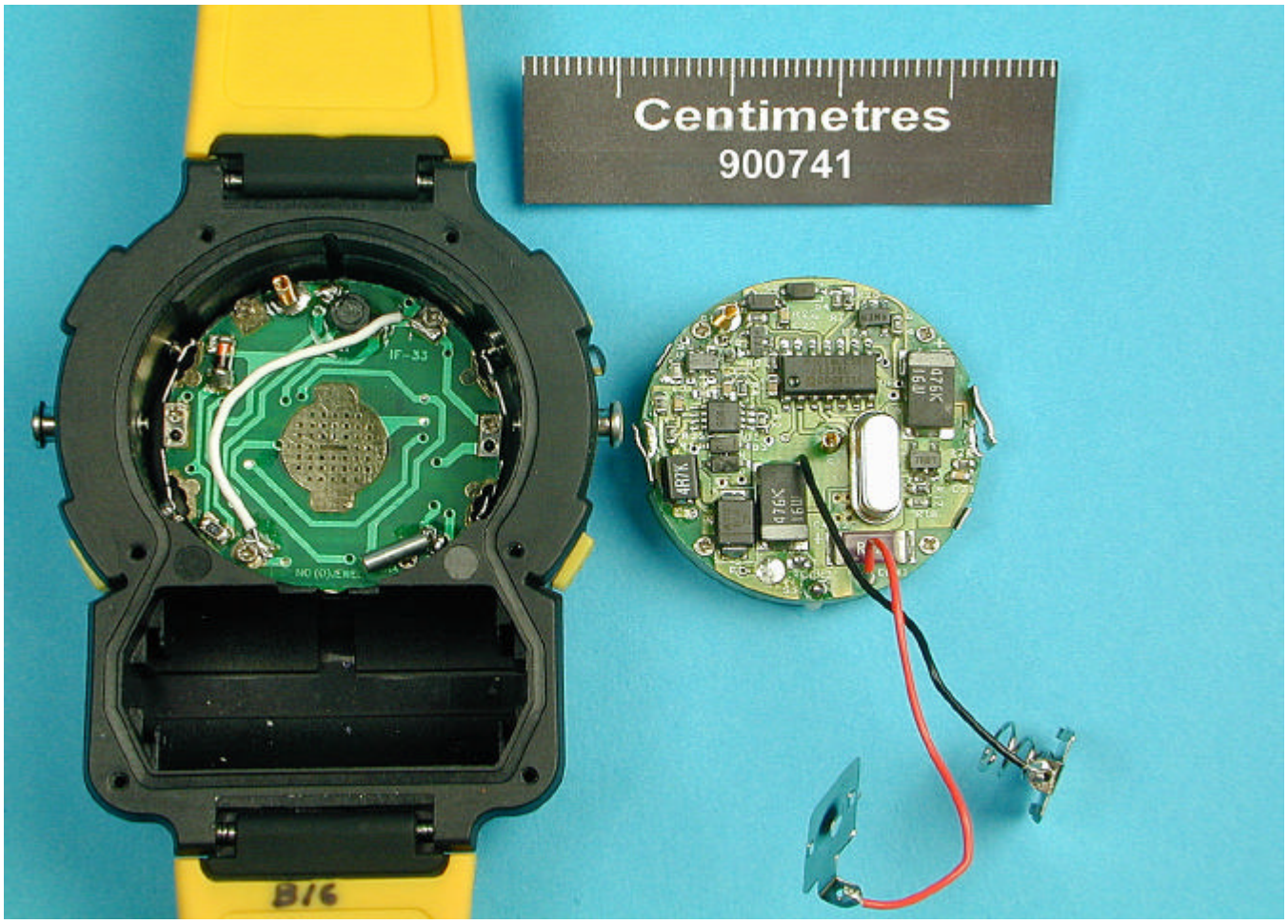


Side View No. 2


Centimetres
900741
Operate in
Emergency Only
Safe Marine Limited
Part No
Frequency (MHz)
GAS6059 - 121.50
Serial No
CE 0191
KEMA 06E 1094 X
Battery CR2

Rear View

Internal View No. 1



Internal View No. 2

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UKAS Accreditations do not cover opinions and interpretations and any expressed herein are outside the scope of any UKAS Accreditation.

Results of tests not yet included in our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).

A N N E X A

Correspondence

MARINE TYPE APPROVALS
DERA Fraser, Fort Cumberland Road,
Portsmouth, Hants. PO4 9LJ
023 9233 4503 Fax 023 9283 0017

DERA

FACSIMILE MESSAGE

To		From	
Name	**Mark Jenkins**	Name	**Peter Goddard**
Address	**BABT Product Services**	Direct Telephone	**023 9233 4507**
Fax Number	01329 443500	Direct Fax	**023 9283 0017**

Subject/Ref. SafeMarine Wrist-worn PLB — No of Pages (Inc.) 1

1-8-00

Dear Mark

Thank you for your letter regarding the appropriate testing for the above equipment.

We agree that the tests listed in your letter posted 31-7-00, would satisfy the essential radio test suite component of the Technical Construction File that SafeMarine will need to submit with their application under the R&TTE Directive.

I hope that this statement satisfies you immediate need if you have any further questions or need any further advice please contact me.

Best regards

Peter Goddard

FAO
CHRIS BLACKLER
SAFE MARINE
01489 557374

Mr Peter Goddard
Maritime Navigation Systems
DERA Fraser
Fort Cumberland Road
Eastney
Portsmouth
PO4 9LJ

Cc. Chris Blackler, SafeMarine

Ref: Type Approval of SafeMarine/PLB

Dear Mr Goddard,

Following our meeting at DERA, Fraser on Tuesday 11th July, I am writing to confirm the tests required under the R&TTE directive for SafeMarine's wrist-worn PLB.

For Radio Testing:
EN 300 152
Clause 8.1 Frequency Error
Clause 8.5 Radiation produced by operation of the test facility
Clause 8.6 Spurious Emissions

For EMC testing:
EN60945: 1997
Clause 9.3 Radiated emissions from enclosure port
Clause 10.4 Immunity to radiated radio frequencies
Clause 10.9 Immunity to electrostatic discharge

Please confirm that the above information is correct and that the tests listed above will satisfy the requirements of the R&TTE directive for this product.

Please do not hesitate to contact me if you require any further information.

Yours sincerely,

Mark Jenkins
Radio Department Manager
BABT Product Service Ltd.