

KANNAD

Z.I. des Cinq Chemins BP23

56520 GUIDEL - FRANCE

Telephone: +33 (0)2 97 02 49 49 Fax: +33 (0)2 97 65 00 20

Web : <http://www.kannad.com> - E-mail : contact@kannad.com

KANNAD 406 Epirbs



MAINTENANCE PROCEDURE

Users are kindly requested to notify KANNAD for any discrepancy, omission or error found in this manual.

Please report to our customer support:

E-mail: support.sar@kannad.com

Tel.: +33 (0)2 97 02 49 00



KANNAD 406 EPIRBs

PAGE : 1 / LOR

DATE : 09/06/06

INDEX : J

REF. : DGM96275

[illegible]



KANNAD 406 EPIRBs

MAINTENANCE PROCEDURE

PAGE : 2 / LOR
DATE : 09/06/06
INDEX : J
REF. : DGM96275

PAGE INTENTIONALLY LEFT BLANK

CONTENTS

Page

1 . KANNAD 406 EPIRBS PRESENTATION	1
1.1.Type and version	1
1.2.Commands and controls	2
1.3.Programming	3
1.4.EPIRB mechanical assembly	4
1.4.1.Old generation (I144 and I144 with I246 or I191)	4
1.4.2.New generation (IMO / I264)	6
2 . KANNAS 406 PH / WH CONTAINER	8
2.1.KANNAD 406 PH / WH Container	8
2.2.KANNAD 406 SW Container	9
2.3.KANNAD 406 S Container	9
2.4.Installation instructions	10
3 . MATERIEL USED FOR PROGRAMMING AND CONTROL	11
3.1.Measurement equipment	11
3.1.1.Measurement equipment without opening the beacon	11
3.1.2.Measurement equipment with beacon opening	11
3.2.Test mock up	11
3.3.Tools	11
3.4.Consumable	11
3.5.Interconnections	12
3.6.KITS for S / SW / PH / WH	12
3.6.1.Upgrade	12
3.6.2.Repair	12
3.7.Safety straps	13
3.7.1.I144 PC board	13
3.7.2.I264 PC board	14
3.8.Battery test mock-up	15
4 . TEST BENCH	16
4.1.Test bench input	16
4.1.1. Test bench configuration	16
4.2.Test bench	16
4.2.1.Measurement equipment configuration	16
4.2.2.Assembly schematic	17
5 . PREVENTIVE MAINTENANCE	18
5.1.Periodic check: logical diagram	20
5.1.1.Opening Container	21
5.1.2.Receiving inspection	21
5.1.3.EPIRB opening	25
5.1.4.Mechanical checks	26
5.1.5.Battery check	27
5.1.6.Control of flash sequence	28
5.1.7.Control of frequencies	29
5.1.8.Control of automatic activation	29
5.1.9.Test before reassembly	29
5.1.10.Reactivation of protection circuits	29
5.1.11.Control of conductivity	29
5.1.12.Beacon closing	30
5.1.13.Water activation	31
5.1.14.Control after closing	32
5.1.15.Watertight test, use of the bath	32
5.1.16.Sealing beacon after closing	32

CONTENTS

	Page
5.1.17.Replacement of release device and container closing	33
5.1.18.Document updates	37
5.2.4 Check and batteries replacement	38
5.2.1.Container opening	39
5.2.2.Receiving inspection	39
5.2.3.EPIRB opening	39
5.2.4.Mechanical checks	39
5.2.5.Battery replacement	39
5.2.6.Control of flash sequence	39
5.2.7.Control of frequencies	39
5.2.8.Control of automatic activation	39
5.2.9.Test before reassembly	39
5.2.10.Reactivation of protection circuits	39
5.2.11.Control of conductivity	39
5.2.12.Beacon closing	39
5.2.13.Water activation	39
5.2.14.Control after closing	39
5.2.15.Watertight test	39
5.2.16.Sealing beacon after closing	39
5.2.17.Replacement of release device and container closing	39
5.2.18.Document updates	39
6 . MAINTENANCE PROCEDURE	40
6.1.Re-coding	40
6.2.Repair	41
6.2.1.3rd generation of EPIRBs	42
6.2.2.4th generation of EPIRBs	44
6.2.3.Overhaul of metallizing	45
6.2.4.Use of conductive paint kit	46
7 . ANNEXES	47
7.1.Annex 1: battery replacement kit	47
7.1.1.Kit presentation	47
7.1.2.Battery pack	48
7.2.Annex 2: Battery replacement modification	49
7.3.Annex 3: WSS procedure level 4	50
7.3.1.Generalities	50
7.3.2.Necessary equipment	50
7.3.3.Control of connector	50
7.3.4.PC board protection	51
7.3.5.Water switch sensor replacement	52
7.4.Annex 4: Reset modification	53
7.5.Annex 5: Flash replacement	54
7.5.1.Flash replacement on beacons 305600<SN<326999	54
7.5.2.Flash replacement on beacons 305600<SN<326999	55
7.6.Antenna (or Antenna O-ring) replacement	56
7.6.1.Antenna disassembly	56
7.6.2.Antenna assembly	57
7.7.Annex 7: I144 PCB	58

1. KANNAD 406 EPIRBS PRESENTATION

1.1. Type and version

This maintenance procedure concerns KANNAD 406 Epirbs.

There are 3 types:

- The survival type:
 - KANNAD 406 S (manual activation),
 - KANNAD 406 WS (manual activation and water activation).
- The float free type (automatic activation):
 - KANNAD 406 F/P: Container made of polyester with an internal membrane (CAL87).
 - KANNAD 406 FH/PH: Container fitted with a HAMMAR release system (CAL 89).
 - KANNAD 406 WH: Container fitted with a HAMMAR release system (CAL 89).

Various versions are on the market further to technical evolutions:

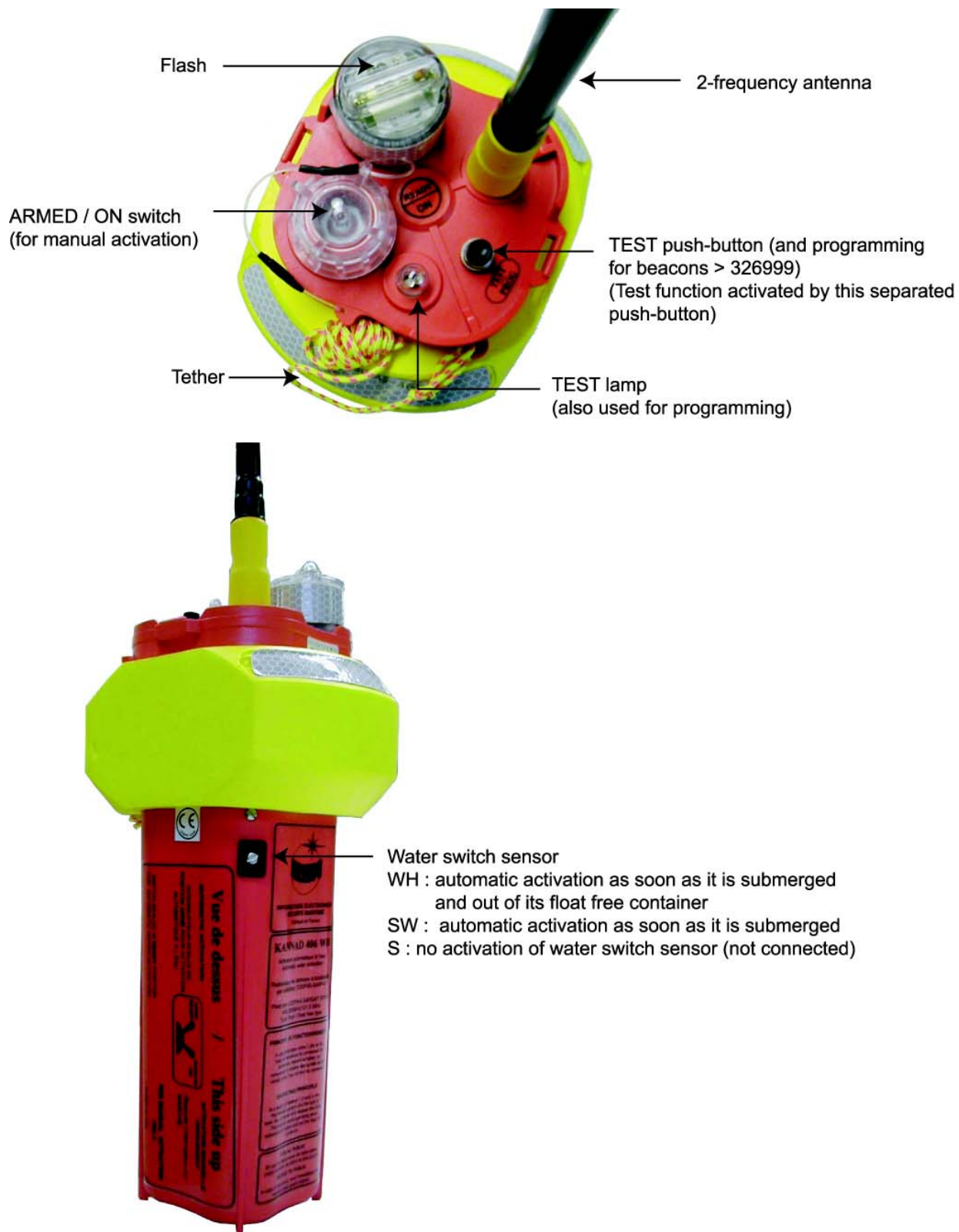
300 000	EU1	with boards	I101B and I 102A	} > 12 years = obsolete Transmitter 121.5 / 406 MHz
	EU2	with boards	I101B and I 102A	
	EU3	with boards	I101C and I 102B	
	EU4	with boards	I101D and I102B	
	EU5	with boards	I101D and I102D	
305 600	MONO	with boards	I144A or B	} - Flash
	MONO1	with boards	I144C	
	MONO2	with boards	I144D	
317 225	ETS 1	with boards	144C and I191	} - Test button - Flash
	ETSI	with boards	144D and I191	
323 154	IEC2	with boards	144D and I246	} - Test button - Flash - WSS*
	IEC2	with boards	I144E and I246D	
327 000	OMI2	with boards	I264A to D	} - Test button - Flash - WSS*

* WSS: Water Switch Sensor

IMPORTANT: Epirbs > 12 years do not fulfil the current standard. They should be declared obsolete and replaced by a KANNAD 406 Epirb of new generation.

1.2. Commands and controls

Figure 1 406 WH, SW, S, commands & controls



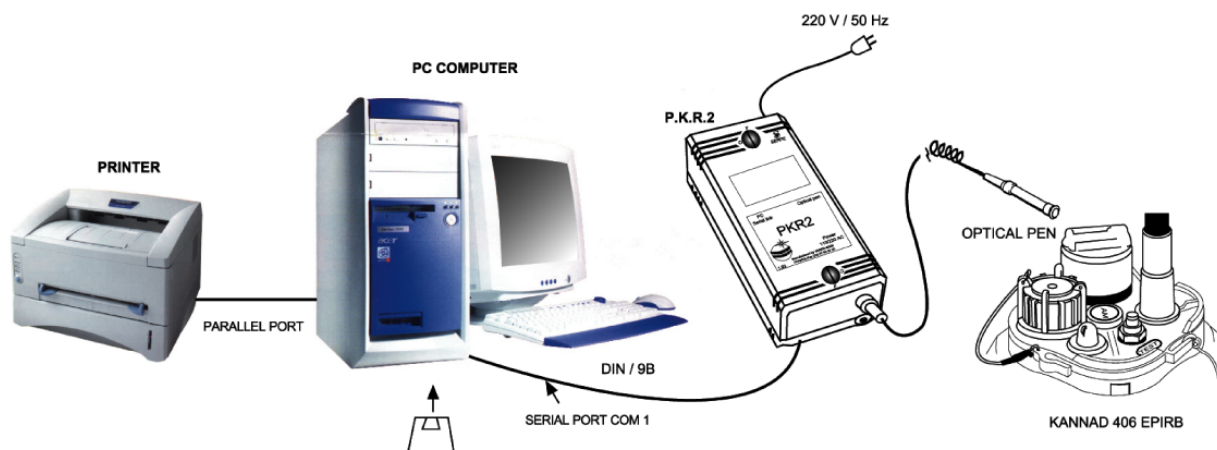
1.3. Programming

KANNAD 406 beacons are encoded with the PKR2 programming kit without opening the beacon. The code is entered inside the beacon memory with an optical pen placed over the beacon test lamp.

The PKR2 works under DOS environment or Windows environment when used with the WinProg software.

Detailed use of programming kit is explained in DOC94075 "COSPAS-SARSAT beacon, KANNAD 406 EPIRB programming".

Figure 2 : Programming KANNAD 406 beacons



1.4. EPIRB mechanical assembly

1.4.1. Old generation (I144 and I144 with I246 or I191)

Figure 3: EPIRB 406, I144 version, mechanical assembly

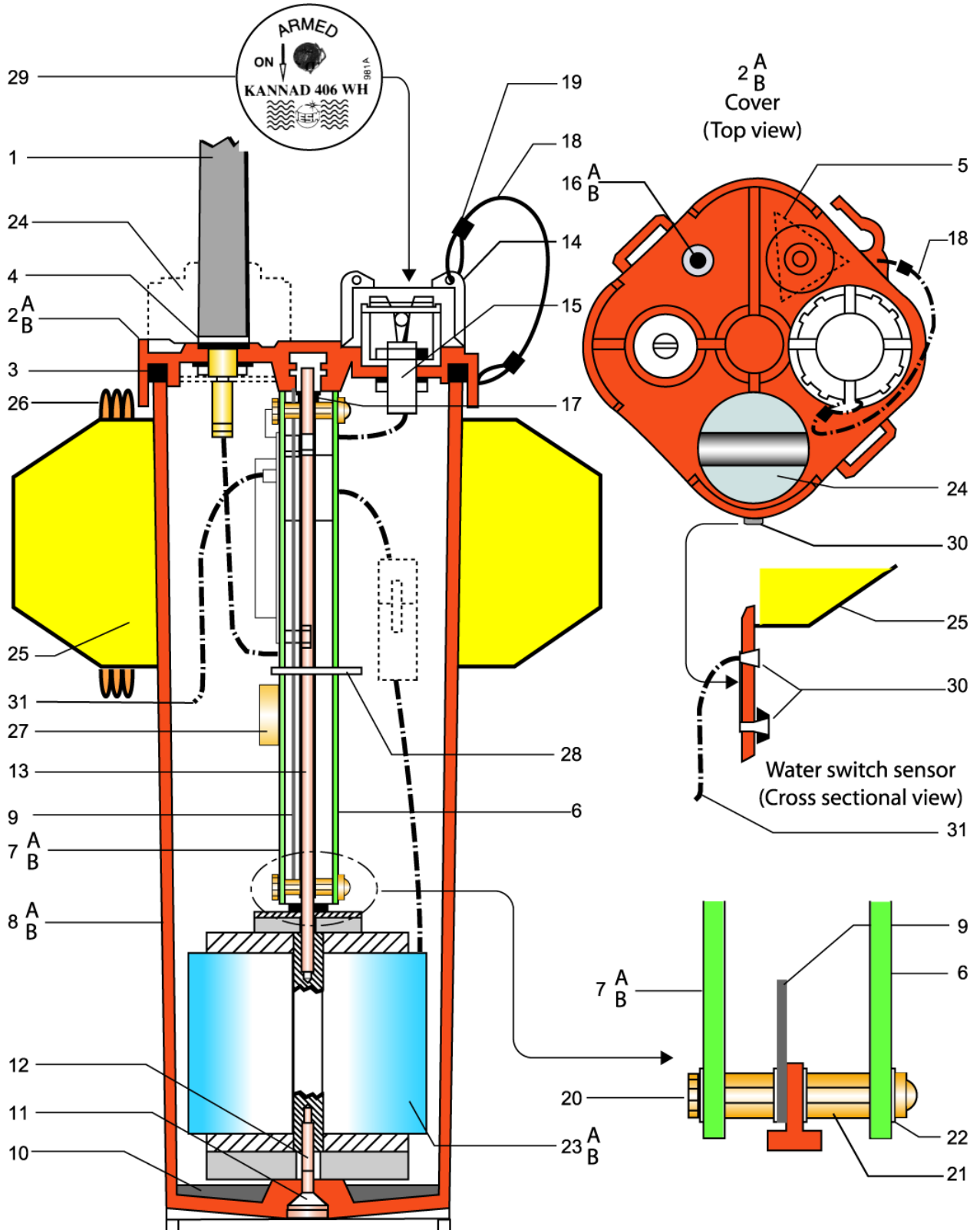


Table 1: I144 / I246, I144 / I191, Part List

I144		
Part Number	Designation	N°
0124192	Two-frequency antenna (SCA 3 SNC 121,5/406 MHz)	1
5101903	Blended cover + flash hole for MON	2A
5101945	Blended cover + flash hole + BP hole	2B
0124024	Conductive O-ring for cover	3
0124059	O-ring for flash / antenna	4
5102780	I 161 board (programming interface)	5
Obsolete	I 144 A/B/C/D/E board	6
Obsolete	ETSI I191 B board test button	7A
Obsolete	WHI 246A BT / WSS board	7B
5101911	Orange blended housing + ballast	8A
5101916	Orange blended housing with WSS (IEC3)	8B
	Shielding plate	9
	Ballast	10
	Nylon washer for VMI06065 screw	11
	TFHC 5X20 stainless steel screw	12
	Stud bolt	13
0131669	Switch protective transparent cap	14
0125665	Unipol stable watertight switch	15
0125742 / 0125743	BP1 Test push button (for cover > 327000), for any replacement cover	16A
0125747	BP1 Test push button (for cover < 327000).	16B
	Stainless steel bolt	17
	Nylon thread Ø = 1mm	18
	Ferrule (int. Ø = 2,2 mm, length 10 mm)	19
	Stainless steel nut	20
	Steel strut	21
	Stainless steel grower washer	22
5101890	 SAFT battery (SOCl ₂)	23A
5101901	 SARTECH battery (Limn O ₂) USA / CANADA	23B
5101912	Flash (2 wires)	24
5101941	Float (Survival type)	25
0121015	Tether	26
See": Battery replace- ment kit 5101950" Fig 29	Desiccant capsule	27
	Cable clamp	28
	Seal for switch (Epirb fitted with WSS)	29
5101947	WSS kit	30
	WSS wire	31



Dangerous goods

1.4.2. New generation (IMO / I264)

Figure 4: EPIRB 406, IMO / I264 version, mechanical assembly

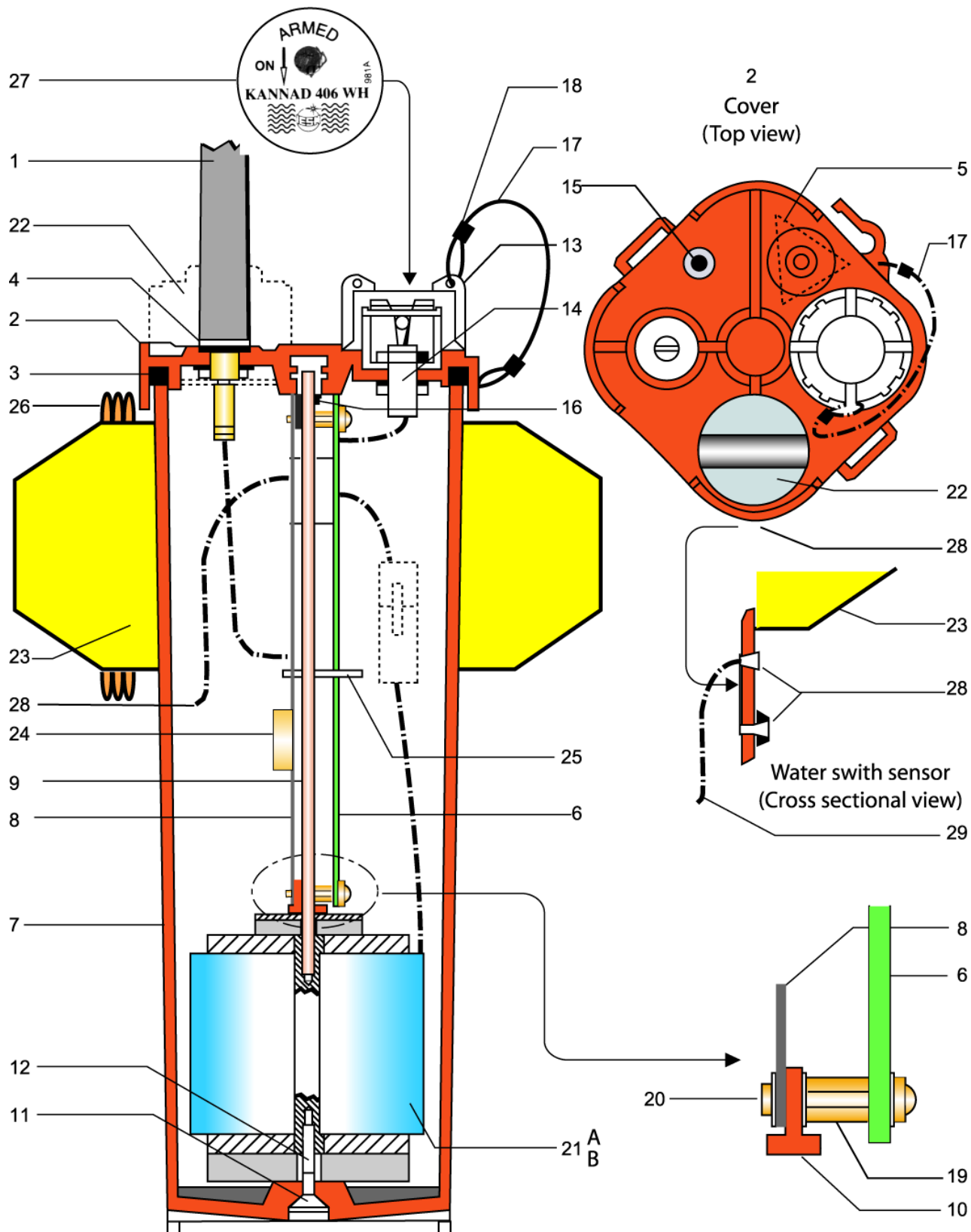


Table 2: OMI version / I264 Part List

OMI version / I264		
Part Number	Designation	N°
0124192	Two-frequency antenna (SCA 3 SNC 121,5/406 MHz)	1
5101945	Blended cover + flash hole + BP hole	2
0124082	White O-ring for cover	3
0124059	O-ring for flash / antenna	4
5101953	I 275 board (programming interface)	5
5101951	I 1264 board	6
5101936	Orange non blended housing + ballast	7
	Shielding plate	8
	Stud bolt	9
	Threaded circuit support	10
	Nylon washer for VMI06065 screw	11
	TFHC 5X20 stainless steel screw	12
0131669	Switch protective transparent cap	13
0125665	Unipol stable watertight switch	14
0125742 / 0125743	BP1 Test push button for cover > 327000).	15
	Stainless steel bolt	16
	Nylon thread Ø = 1mm	17
	Ferrule (int. Ø = 2,2 mm, length 10 mm)	18
	Stainless steel nut	19
	Board screw	20
5101937	 SAFT battery (SOCl2)	21A
5101942	 SARTECH battery (Limn O2) USA / CANADA	21B
5101939	Flash kit (3 wires)	22
5101941	Float (S/WH)	23
See": Battery replace- ment kit 5101950" Fig 29	Desiccant capsule	24
	Cable clamp	25
0121015	Tether	26
	Seal for switch	27
5101947	WSS kit	28
	WSS wire	29



Dangerous goods

2. KANNAS 406 PH / WH CONTAINER

Labelling (Fr, GB, Esp, ETC...) under customer requirements.

2.1. KANNAD 406 PH / WH Container

Beacon type CAL 89 automatic released with hydrostatic release system type H20

- Container PH / WH (1): P/N 1200256
- Hydrostatic release system (2): P/N 5103555
- Manual locking system (5): P/N 5102004

Figure 5: Container Description



This container is used to protect an EPIRB (Emergency Position Indicating Radio Beacon) of KANNAD 406 type and to ensure that the beacon is released and operates automatically in the event of a ship wreck. It should be installed on the wheelhouse and preferably in horizontal position, so that the beacon can rise easily to the surface.

The CAL 89 (1A/B) makes an envelope that gives excellent protection to the beacon. This envelope is made of IMPAX, a polycarbonate material extremely resistant to shocks, according to the double skin technique filled with polyurethane foam. The release device used is the Hammar H20 hydrostatic release (2).

At a depth of 1.5 m to 4 m (4 to 12 ft.), the release system operates and cuts the locking axe (3). The cover (1A) is released and allows the beacon (4) to rise to the surface: when the beacon leaves the lower part (1B) of the container, it is automatically activated. Installation and operation instructions must be strictly followed.

IMPORTANT: The HAMMAR release device must be replaced every two years from installation date.

It is possible to open the container manually by opening the manual locking system (5).

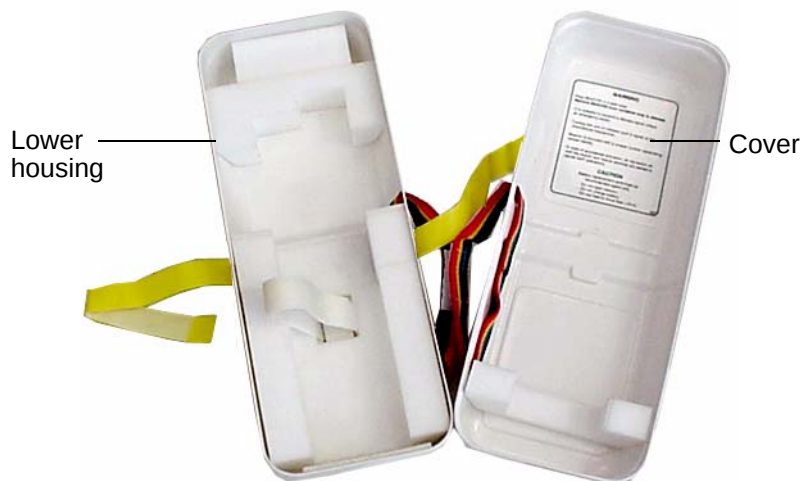
Weight of container: 2,95 Kg.

Size: 435 x 220 x 155 mm.

2.2. KANNAD 406 SW Container

- SW container: 5101904.
- Strap: 0131654.
- Wedging foam: 5101902.

Figure 6 : Container for KANNAD 406 SW *with water switch sensor*



2.3. KANNAD 406 S Container

- S container: 5101891.
- Strap: 0131654.
- Wedging foam: 5101902.

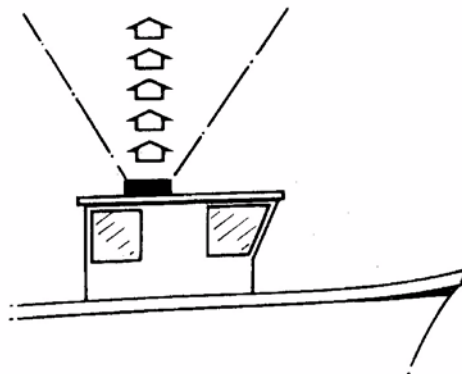
Figure 7: Container for KANNAD 406 S *without water switch sensor*



2.4. Installation instructions

The container should be installed on the wheelhouse and comply with the following instructions:

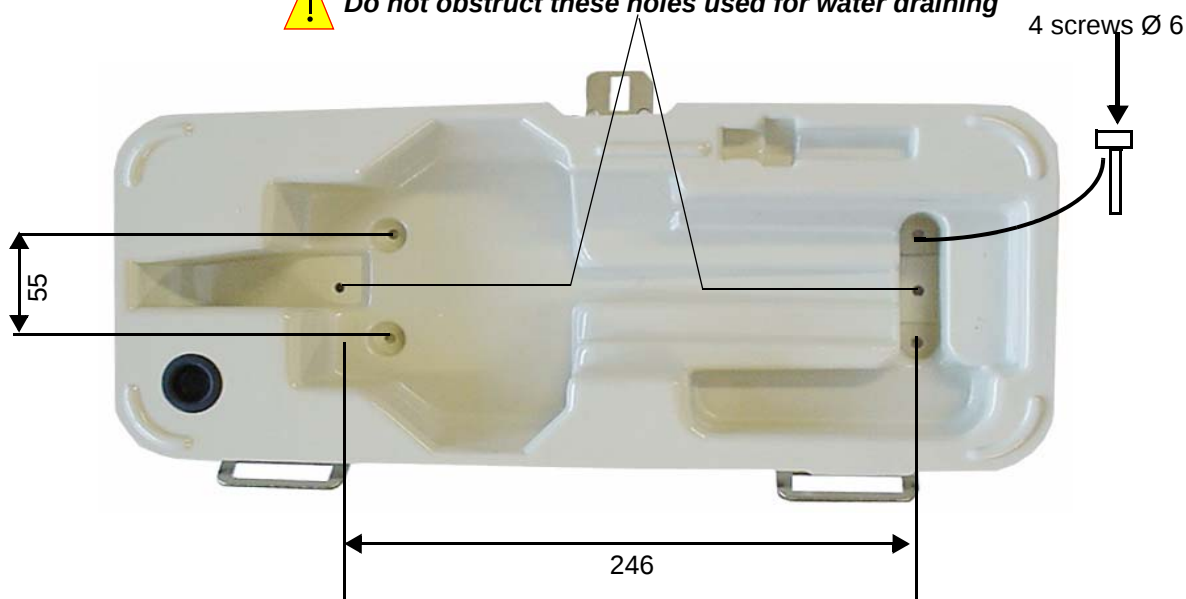
- horizontal position;
- clear area to allow the beacon to rise to the surface, should the ship sink. Watch rigging antennae or shroud that could build obstacles (see figure hereunder);



- easy access to the crew for manual operation;
- firmly fixed to the deck with 4 screws as shown hereunder.



Do not obstruct these holes used for water draining



NOTE: As each vessel is particular, one will have to adapt to each case and possibly make adjustment parts.

3. MATERIEL USED FOR PROGRAMMING AND CONTROL

3.1. Measurement equipment

3.1.1. Measurement equipment without opening the beacon

Equipment	SERPE-IESM reference
PKR2 Programming Kit with software, optical pen and PC connection	1200361
IESM 406 tester MK II or equivalent	0139385
Faraday box	0137913

3.1.2. Measurement equipment with beacon opening

ATTENTION : handling should be performed on an antistatic plan, the measurement equipment should be grounded. Do not wear synthetical clothes.

Equipment	SERPE-IESM reference
Oscilloscope (2 channels / 100 Mhz minimum)	
Radio communication test bench (ROHDE & SCHWARZ or equivalent)	CMS50
Multimeter (Fluke 77 or equivalent)	
Stabilised and adjustable power supply 4 Amper minimum, 0/20 Volts with current and voltage gauges	

3.2. Test mock up

Equipment	SERPE-IESM reference
J2 permanent 406 MHz Module for I144 (MON)	MTS 0506
Battery tester	MTS 0514

3.3. Tools

Designation	Supplier reference
Torque wrench (RADIAL) subvis antenna coaxial	R 282 318 000
Adjustable torque wrench from 10 to 120 cNm : 3 mm allen bit for beacon closing 13 mm socket for release system assembly - Flat bits for water switch sensor assembly	SAM ref 40
Iron solder with antistatic soldering bit 300°C	

3.4. Consumable

Designation	SERPE-IESM reference
Solder with incorporated flux (tin 60%, lead 40%)	XMC00115

Designation	SERPE-IESM reference
Soldering with flux (60% tin, 40% lead)	0137610
Cleaning flux	0137612
Dust removal spray	0137644
Insulating and tropicalizing varnish	0137615

3.5. Interconnections

Designation	SERPE-IESM reference
2 coaxial cables	
2 banana cables	
1 BNC / SMC adapter R191 120	0126281
1 power cable (banana, female connector)	

3.6. KITS for S / SW / PH / WH

3.6.1. Upgrade

Designation	SERPE-IESM reference
SAFT battery for beacons < 327000	5101890
SAFT battery for beacons > 326999	5101937
Battery replacement Kit	5101950
Conductive O-ring (black) for beacon cover < 327000	0124024
O-ring (white) for beacon cover ≥ 327000	0124082
Battery modification Kit for beacons fitted with I144 board	5101930
Water switch sensor Kit	5101947
Reset Kit	5101932

3.6.2. Repair

Designation	SERPE-IESM reference
Flash 2 wires for I144 board	5101912
Flash 3 wires for I264 board	5101939
Two-frequency antenna	0124192

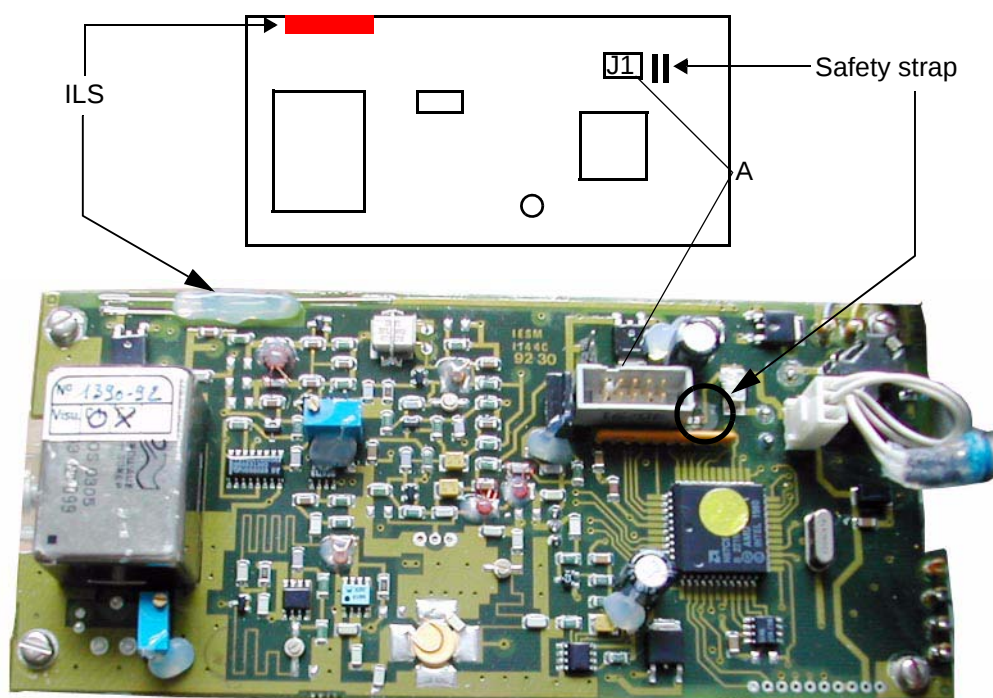
3.7. Safety straps

IMPORTANT: To avoid destruction of the general fuse when testing 406 MHz beacons fitted with I144 and I264 PC boards, the safety under mentioned must be removed before any intervention.

The purpose of this safety is to stop the beacon from transmitting in the event of a microprocessor dysfunction causing 406 permanent transmission.

3.7.1. I144 PC board

Figure 8: I144 PCB, implementation



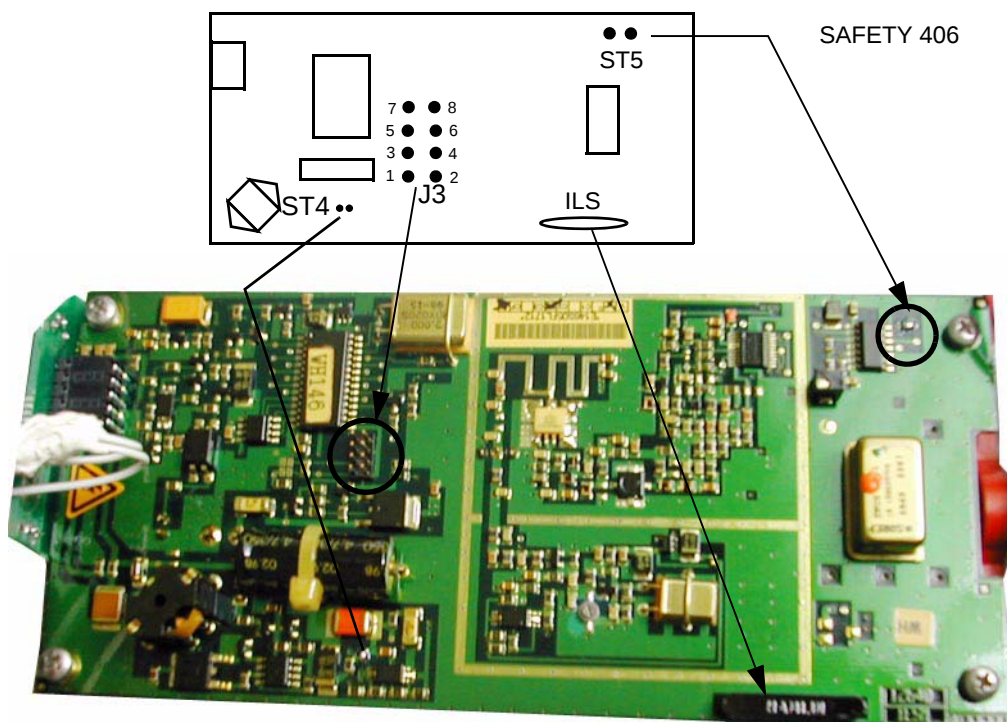
Use MTS0506A to obtain 406 continuous transmission.

406 Test can be performed with connector J1 (A), interface for MTS0506.

Check the position of indexing slot.

3.7.2. I264 PC board

Figure 9: I264 PCB, safety strap



Different selection modes:

- 1 - 2: 406 7 sec.
- 3 - 4: permanent 406 (7 sec. ON, 7 sec. OFF).
- 5-6: unmodulated 121.5 MHz.

3.8. Battery test mock-up

Figure 10: Battery test mock-up and assembly drawing

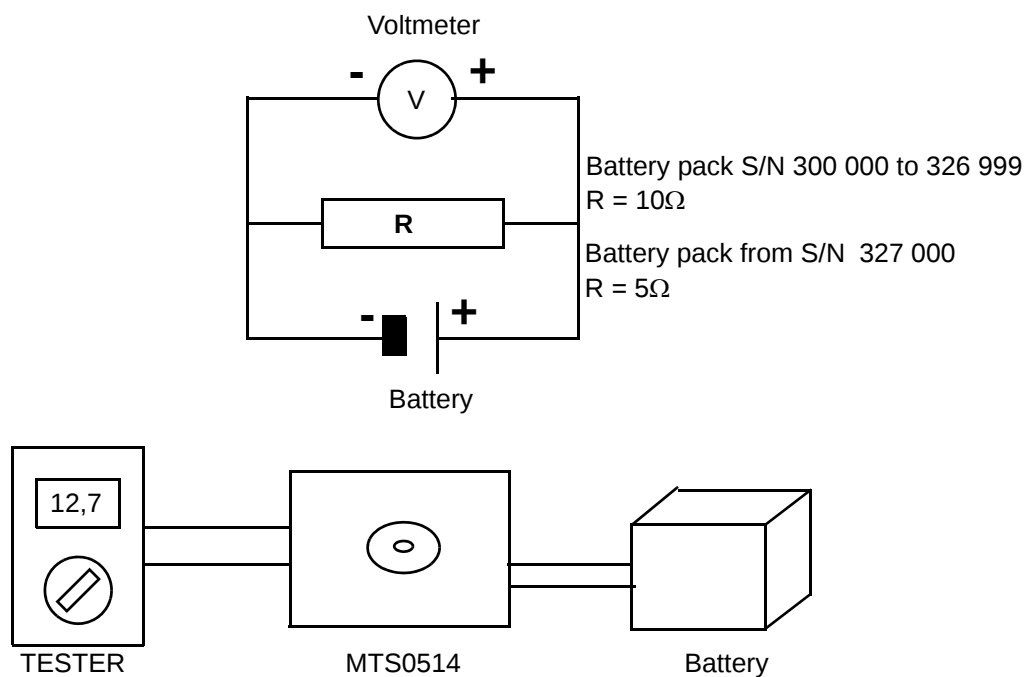
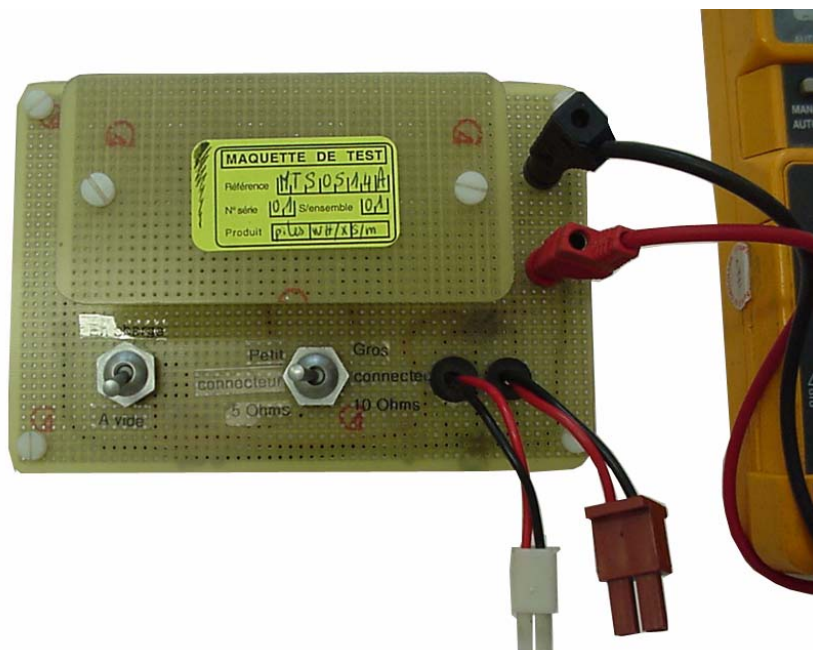


Figure 11: Example of MTS0514 test mock-up

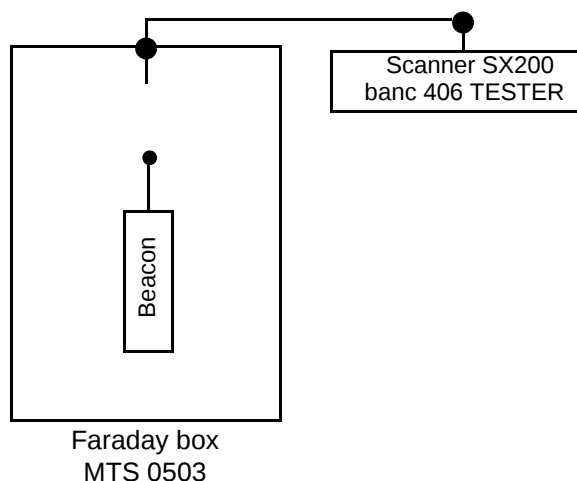


Battery test procedure: see [paragraph 5.1.5.2. Testing the battery.](#)

4. TEST BENCH**4.1. Test bench input****4.1.1. Test bench configuration**

- Decoder reset (IESM 406 TESTER or IESM 406 GONIO 400).
- Recall I (HP 54 501 A).

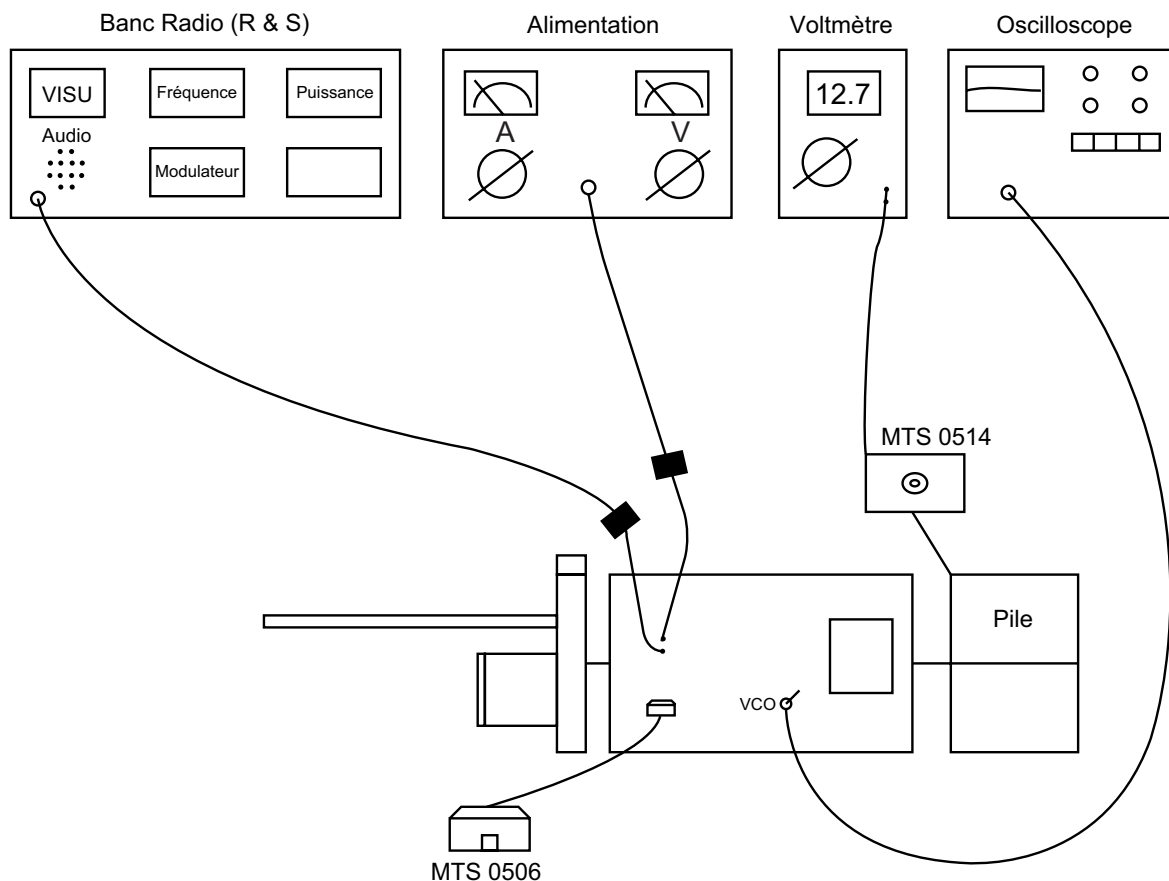
Figure 12: Connection schematics

**4.2. Test bench****4.2.1. Measurement equipment configuration**

- Radio communication test bench (example of configuration with a ROHDE & SCHWARZ CMT 54 bench):
 - Stand by → (time 1ms) = Demod (--) → demod beat → lock
 - 121,5% → max PK → (programmed) 121,5 → set → (amplitude) 40%
 - 406 rad → max PK → count → (amplitude) 1 rad
- Voltmeter (on position DC).
- Power supply:
 - Voltages:
 - Boards I144 (MON): 12 V DC.
 - Boards I264 (IMO2): 10 V DC.
 - Intensity:
 - I144 (MON): 2A max.
 - I264 (IMO2): 3A max.
- Oscilloscope with 100 MHz probe.

4.2.2. Assembly schematic

Figure 13: Example of an assembly for I144 board



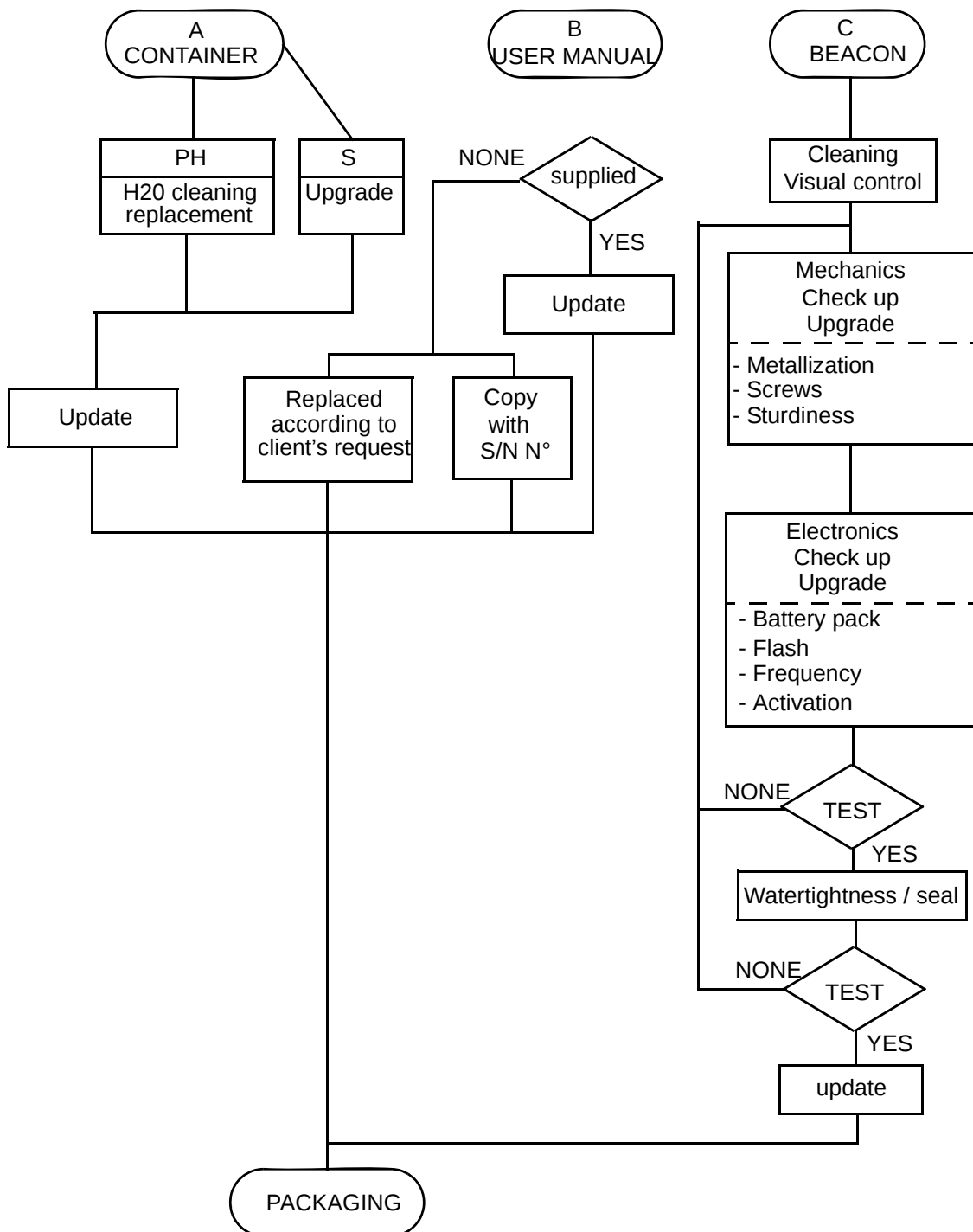
5. PREVENTIVE MAINTENANCE

Table 1: 2 and 4 year controls, check list

	Control		Result	Action
	Receiving inspection			
1		Administrative input		
2		Operational state		
3		Starting sequence		
4		Flash / or lamp		
5		Code / transmission		
6		Automatic activation		
7		General aspect		Statement
	Beacon test			
8	Beacon opening (dis-connect battery / antenna)	Power supply: 3A.10V for beacons > 327000 2A.12V for beacons <327000		
9	Battery Test	Date of control	If > 4 years	Replacement
10	I144 < 327000 I264 > 326999	Voltage on 10 ohms load. SAFT : If < 12 V keep on load ≈ 5 mn No load voltage and voltage on 5 ohms load SAFT : If < 9 V keep on load ≈ 5 mn	If < 11V (Sartech) If < 12V (Saft) on load If < 11V (Sartech) If < 9V (Saft)	Replacement § 5.1.5.1.
11	Connect the beacon	On power supply and test bench, deactivate protection circuit against permanent transmission	I144 ST1 I264 ST5	§ 3.7.
12	Upgrade	Reset Batteries WSS		§ 7.4. Ann. 4 § 7.2. Ann. 2 § 7.3. Ann. 3
13	Flash	Sequence	20 à 30 flashes /mn	§ 7.5. Ann. 5
14	121,5 MHz control	Power	10 dBm < < 15 dBm	Adj. § 6.2.1.
15		Demodulation depth	85% <<100%	Adj. § 6.2.1.
16		AM Demodulation	Audio control	Adj. § 6.2.1.
17		Consumption	< 100mA	Adj. § 6.2.1.
18	406,025 MHz control	Connect MTS0506 to J2 (I144) Strap J3 (3-4) (I264)		§ 3.7.1. § 3.7.2.
19		Power	35 dBm << 39dBm	Adj. § 6.2.1.
20		Frequency 406,025 MHz	±1KHz	Adj. § 6.2.1.
21		Biphase Modulation 400 Hz	2 rd << 2,4 rd	Adj. § 6.2.1.

	Control		Result	Action
22		Carrier noise	< 0,2 rd	Adj. § 6.2.1.
23		VCO voltage	According to Serial Number 2.2 or 4 Vdc	Adj. § 6.2.1.
24	Automatic activation	Magnet sensitivity		§ 5.1.8.
25	Press test button	Stop after 1 cycle	Stop after ≈ 30s	
26	Re-activation of protection circuit			
27	Cover / O-ring / housing conductivity control	Epirbs < 327000	< 200 ohms	O-ring replact. Overhaul of metallization § 6.2.3.
28	Water activation	Short circuit 1s the 2 contacts of housing. If WSS not black: replacement	Stop after ≈ 10s	§ 7.5. Ann. 5
29	Epirb closing	Every 4 years, replace O-ring cover and Desiccant - Torque wrench 110CNm		
	1st check			
30		Operational state / reading of beacon to check production date	If > 12 years	Obsolete
31		Start up sequence		
32		Flash / or lamp		
33		Code / transmission		
34		Automatic activation		
35		General aspect		Statement
36	Watertightness control & 5.1.15.	5 minutes at 55°C ±10°C	No bubbles	Check closing
37	Wax seal applying			
	1st check			
38		Operational state		
39		Start up sequence		
40		Flash / or lamp		
41		Code / transmission	Decoding recording	Printer output
42		Automatic activation		Statement
43	Documents update	Labelling Manual		
44	Re-consignment	Administrative input		& 5.1.18.

5.1. Periodic check: logical diagram



5.1.1. Opening Container

Figure 14: Hammar release device in locked position



- Unlock and remove the snap hook, disengage the severable axis.
- Open the cover.

5.1.2. Receiving inspection

5.1.2.1. Registration of information

- Supplied by customer.
- On beacon and user manual.
- In our archives (computer files and handwritten).

5.1.2.2. Visual control

BEACON:

- Labelling aspect (possible check of validity dates).
- Housing and cover aspect

CONTAINER:

- Labelling (possible check of validity dates).
- Mechanical aspect:
 - (S) wedging foam and strap.
 - (FH) springs, H2O tongue and groove, hinges, snap hook.

5.1.2.3. Programming control

Check the programming data of the beacon as indicated in the programming manual DOC94075 (COSPAS-SARSAT beacons, Programming).

If necessary, re-program the beacon as indicated in the programming manual and update (see logigram 3, [paragraph 6.1. Re-coding](#)).

5.1.2.4. Functional control

This test has to be performed inside a Faraday box (see [paragraph 4.1. Test bench input](#)).

(1) Switch on the beacon and put it into the Faraday box.

- Check the blinking of the red led:
 - (from 300 000 to 312 999) steady blinking of red led for about 35 seconds, then acceleration of blinking and starting of flash.
 - (313 000 and more) steady blinking of red led for about 35 seconds, then stop of blinking and starting of flash.
- CLOSE THE SHIELDED BOX, because the beacon will transmit within the next few seconds after the real message, control message transmitted by the beacon with 406 Tester. This message is a real distress transmission.
- Switch the 406 Tester in reception mode to check the homing.
- Wait for the next 406 transmission to switch beacon off (less than 10 seconds after the transmission).
- Check the received data on the Tester and compare with the data indicated on the beacon and inside the user manual.
- With an interface and the optical pen (PKR2, Control of a beacon), compare the data processing file and the data indicated on the beacon.

NOTE: Homing can be checked thanks to an audio control scanner (some beacons are not fitted with homing, this is indicated on labels or when reading with the PKR2).

NOTE: For WH /FW types, the test starts differently for automatic operation control (See "[WH \(greatest than 327000\) test procedure](#)", para 5.1.2.6.).

5.1.2.5. Test of KANNAD 406 ETS beacon inside container.

ON/OFF test (maximum 40 seconds) out of the Faraday box.

(1) Switch on the beacon:

- during 10 seconds, check that the led blinks.

(2) Place the beacon inside the lower part of the float free container:

- check that the steady blinking of the led (2 blinks per second) stops,
- check that flash operates correctly (total 6 or 7 flashes).

(3) Remove the beacon from the container:

- check that the steady blinking of the led (2 blinks per second) starts again.

(4) Switch the beacon off.

(5) Press the TEST button

- check that the steady blinking of the led (2 blinks per second) starts again and the flash operates correctly,
- led and flash stop operating after approximately 45 seconds.

(6) END OF TEST.

5.1.2.6. WH (greatest than 327000) test procedure

(1) In the container, lift the beacon up.

IMPORTANT: Do not switch on (picture below)

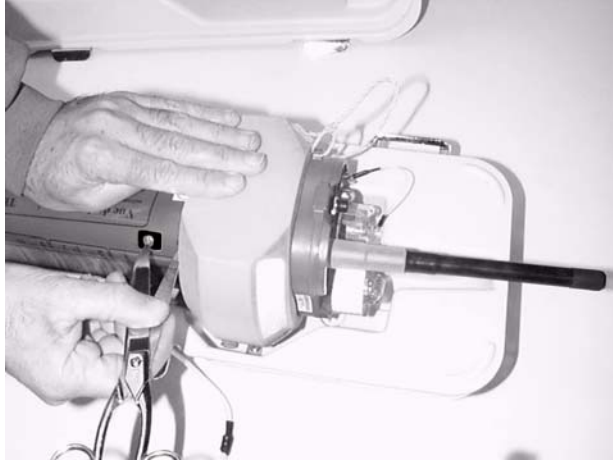


(2) Short circuit the water contact of the housing with a metallic conductive device as shown herunder.



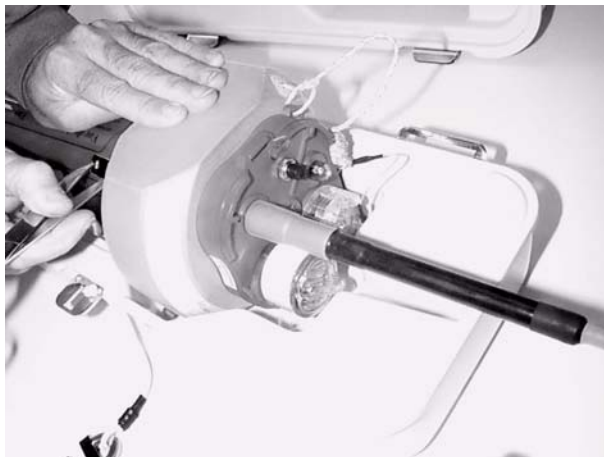
Led flashes

(3) Lie down the beacon in position inside the container lower part

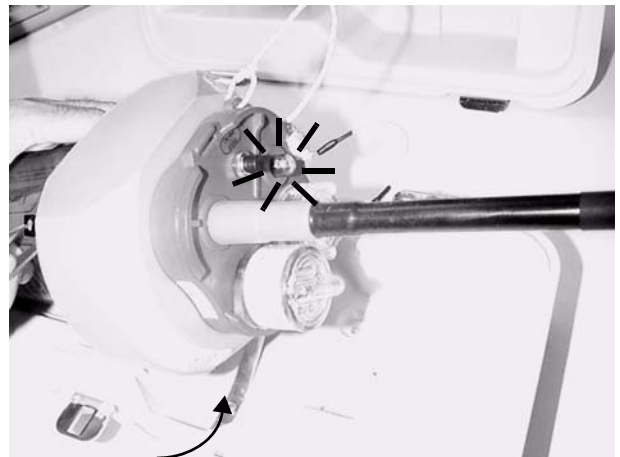


Led stops flashing

(4) Keep this short-circuit (A) while taking the beacon out of the container (B)



A



B



Led should flash

(5) Remove the short circuit to stop the beacon. The led stops blinking after a few seconds.



END OF TEST

5.1.2.7. TEST button, operation control

(1) ETSI and WH < 327000

- Press TEST button.
- Check led and flash blinking (the blinking lasts about 45 seconds).

(2) ETSI and WH ≥ 327000

- Press TEST button.
- Check led and flash blinking (the blinking lasts about 30 seconds).

5.1.3. EPIRB opening

IMPORTANT: For any EPIRB opening, the old desiccant capsule must be replaced by a new one.

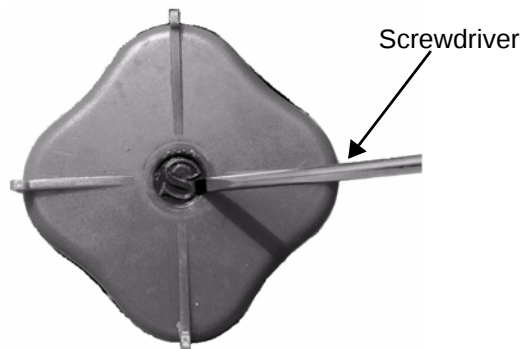
NOTE: The beacon leaves the factory sealed with a wax seal applied over the hexagonal socket screw to guarantee that no internal operation has been performed. This seal has no watertightness function it is advised to restore it after control.

TOOLING

- 4mm screwdriver (used for wax removal),
- 3mm Allen wrench (supplied).

PROCEDURE

Figure 15: Wax seal removal



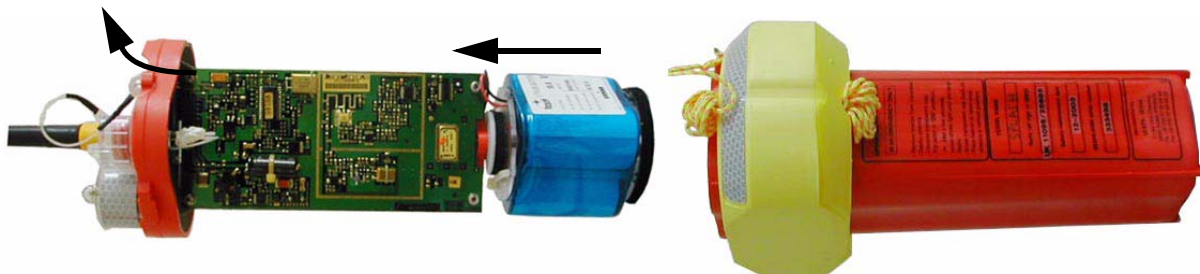
- With a screwdriver, remove the wax seal at the bottom of the housing.

Figure 16: Housing opening



- Unscrew the hexagonal socket of the housing.

Figure 17: Electronic unit removal



- Pull out the cover to take the electronic unit out.

5.1.4. Mechanical checks

CAUTION: before any control, check that all mandatory updates have been already performed (see corresponding annexes).

5.1.4.1. Housing control

Check the general aspect of the housing:

- replace the housing if it is cracked.

Check the water switch sensor:

- change the water switch sensor if it is not a black one: refer to [paragraph 7.3. Annex 3: WSS procedure level 4](#).
- Check the metallization of the housing:
- if the metallization is damaged, refer to [paragraph 6.2.3.2. Overhaul of cover and housing plating](#).

5.1.4.2. Cover control

Check the antenna and its O-ring (visual check):

- if damaged, replace the antenna and/or the O-ring as explained [paragraph 7.6. Antenna \(or Antenna O-ring\) replacement](#).

Check the flash (visual check):

- replace the flash if is damaged or in case of malfunction: refer to [paragraph 7.5. Annex 5: Flash replacement](#).

Check the cover metallization:

(1) With an ohmmeter, check the conductivity from the center of the cover O-ring to the base of the antenna:

- conductivity < 200 ohms: the metallization is correct,
- conductivity > 200 ohms: proceed as explained [paragraph 6.2.3.1. Conduction default or oxidations marks](#) (2).

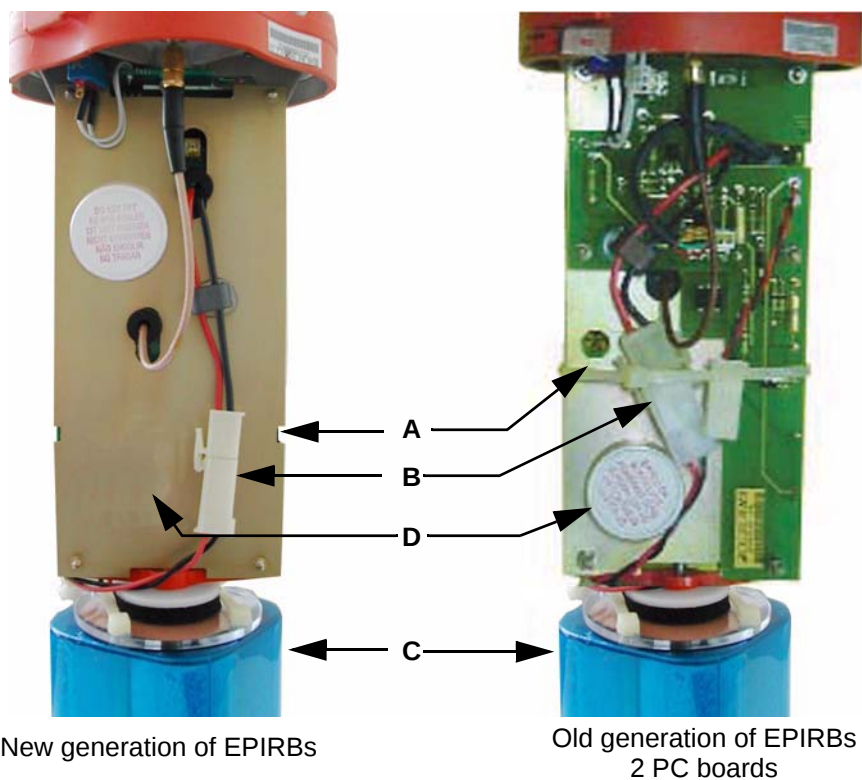
(2) Check visually that the internal groove is correctly metallized:

- if not, proceed as explained [paragraph 6.2.3.1. Conduction default or oxidations marks](#).

5.1.5. Battery check

5.1.5.1. Battery removal

Figure 18: Battery / Desiccant removal



- Cut the cable clamp (Figure 18, detail A).
- Disconnect the nylon indexing connector (Figure 18, detail B).
- Unscrew the battery (Figure 18, detail C).
- Remove the desiccant (Figure 18, detail D).

IMPORTANT: For any EPIRB opening, the old desiccant capsule must be replaced by a new one supplied with the battery replacement kit P/N 5101950 (See "Annex 1: battery replacement kit", para 7.1.).

5.1.5.2. Testing the battery

- Connect the battery to the MTS0514 mock-up (see [paragraph 3.8. Battery test mock-up](#)).
- Check the output voltage and replace the battery if necessary.
The values should be the followings:

Bloc de piles	Measurement configuration	Value
SAFT battery pack up to S/N 326 999 (large connector)	Voltage on 10 ohms load. If < 12 V, keep on load $\approx$ 5 mn	≥ 12 V
SAFT battery pack from S/N 327 000 (small connector)	Voltage on 5 ohms load. If < 9 V, keep on load $\approx$ 5 mn	≥ 9 V
SARTECH battery pack up to S/N 326 999 (large connector)	Voltage on 10 ohms load.	≥ 11 V
SARTECH battery pack from S/N 327 000 (small connector)	Voltage on 5 ohms load.	≥ 11 V

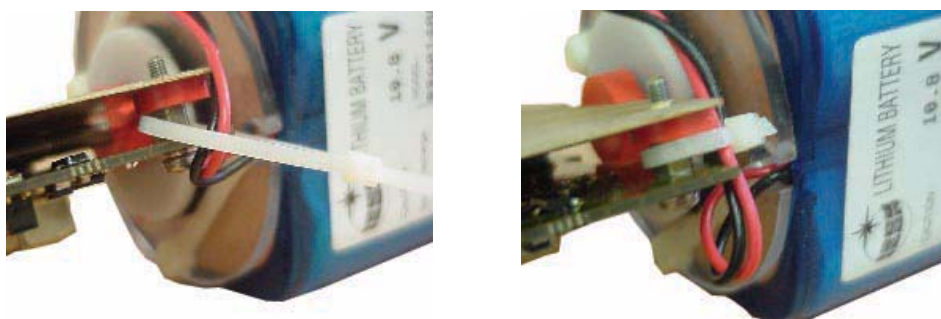
5.1.5.3. Battery reassembly

Figure 19: Battery connection



- Screw the new battery pack and re-connect the connector ([Figure 19](#)).

Figure 20: Battery clamping



- Clamp the battery connection wire ([Figure 20](#)) with the cable clamp supplied with kit 5101950.

5.1.6. Control of flash sequence

When checking the 121.5 MHz frequency, check that the flash cadence is 20 to 30 strokes / minute.

5.1.7. Control of frequencies

CAUTION: before any control, check that mandatory updates have been already performed (see corresponding annexes).

- Deactivate the protection circuits against permanent transmissions (see [paragraph 3.7. Safety straps](#)).
- Connect the beacon as explained [paragraph 4.2. Test bench](#).
- Check 121.5MHz and 406.025 MHz frequencies.

(1) 121.5 MHz modulated control

Check that:

- The power is between 10 dBm and 15 dBm.
- The demodulation is between 85% and 100%.
- Demodulation (Audio control).
- Consumption $\approx$ 100 mA.

If the measurements are different from the above values, refer to [paragraph 6. MAINTENANCE PROCEDURE](#).

(2) 406.025 MHz control

Connect MTS0506 to J2 of I144 board and strap (3-4) J3 of I264 (see [paragraph 3.7. Safety straps](#)) and check:

- The power is between 35 dBm and 39 dBm.
- Frequency = 406.025 MHz $\pm$ 1 KHz
- 400 Hz bi-phase modulation comprise between 2.1 and 2.3 rd.

CAUTION: do not adjust this control.

- Noise carrier < 0.2 rd.
- VCO voltage = 2.2 or 4 Vdc (according to serial number).

If the measurements are different from the above values, refer to [paragraph 6. MAINTENANCE PROCEDURE](#).

5.1.8. Control of automatic activation

I144

- (1) Switch on the beacon (the flash is blinking).
- (2) Position a magnet in front of the ILS (see [Figure 8 page 13](#)): the flash stops blinking.
- (3) Check the consumption: consumption = 0.
- (4) Switch off the beacon

I 264

- (1) Strap the WSS (the flash is blinking).
- (2) Position a magnet in front of the ILS (see [Figure 9 page 14](#)): the flash stops blinking.
- (3) Check the consumption: consumption = 0.
- (4) Remove the WSS strap.

5.1.9. Test before reassembly

Press TEST button: the flash blinks then stops after $\approx$ 45 seconds if S/N < 327000, 30 seconds if S/N $\geq$ 327000.

5.1.10. Reactivation of protection circuits

Re-activate the protection circuits against permanent transmissions previously deactivated [paragraph 5.1.7. Control of frequencies](#).

5.1.11. Control of conductivity

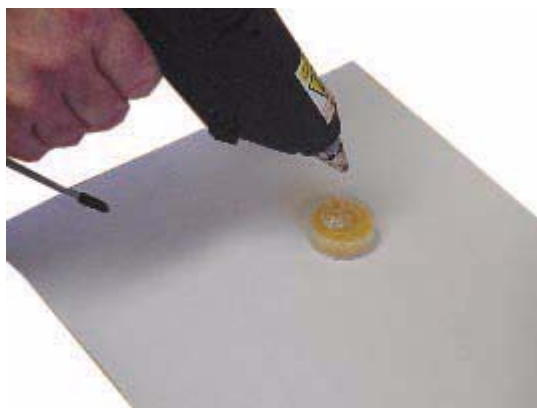
Before reassembly beacons < 327000, check that the cover / O-ring / housing conductivity is < 200 ohms (see [paragraph 5.1.4.2. Cover control](#)).

5.1.12. Beacon closing

CAUTION: if the desiccant capsule has not been replaced before, remove the old one and replace it.

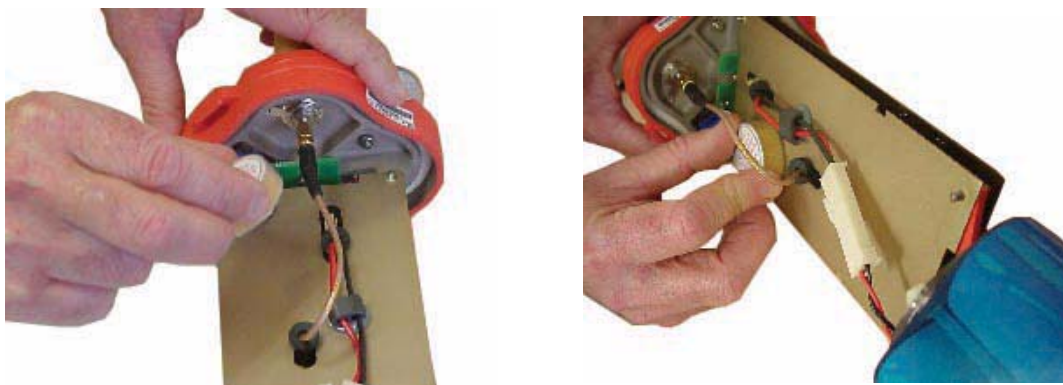
5.1.12.1. Fitting a new desiccant capsule

Figure 21: Fitting desiccant capsule, phase 1



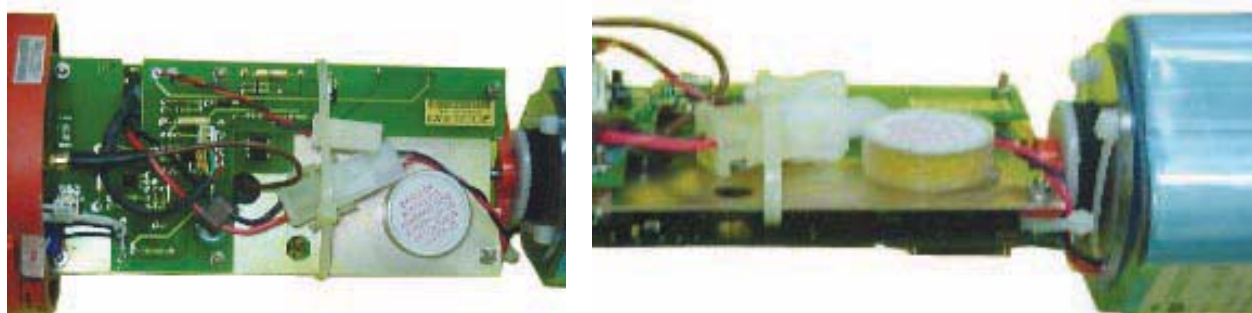
- With a glue heating gun, apply a drop of glue (supplied with kit S0519525B) onto the back of the desiccant capsule.

Figure 22: Fitting desiccant capsule (new generation of EPIRBs)



- New generation of EPIRBs: stick desiccant capsule directly on the metal plate as shown [Figure 22](#). Keep pressing a few seconds.

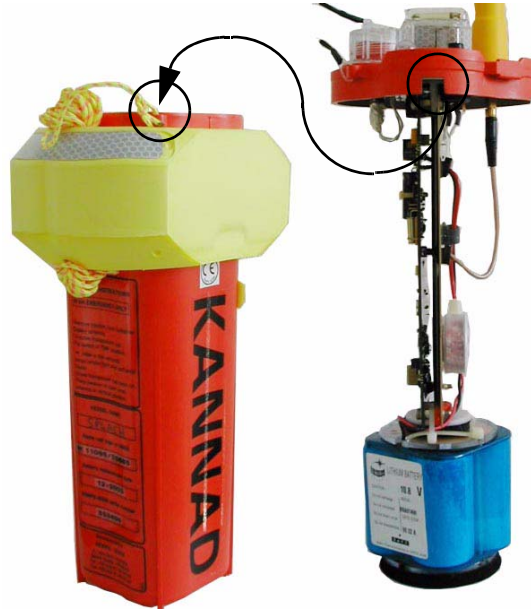
Figure 23: Fitting desiccant capsule (old generation of EPIRBs)



- Old generation of EPIRBs with 2 PC boards (I144 / I246 or I144 / I191) less than 327000: stick desiccant capsule onto the lower part of PC board as shown [Figure 23](#).

5.1.12.2. Electronic unit reassembly

Figure 24: EPIRB closing phase 1



- Put the electronic unit into the housing according to the index position as shown [Figure 24](#).

CAUTION: do not forget to connect the water switch sensor (see [paragraph 7.3. Annex 3: WSS procedure level 4](#)).

Figure 25: EPIRB closing phase 2



- Fit the hexagonal socket screw (A) with a new washer (B).
- Tighten screw with a torque wrench fitted with a 3 mm allen bit (torque = 110 CNm).
- Perform watertight test (See ["Watertight test, use of the bath"](#), para 5.1.15.).

For inboard installation, See ["Installation instructions"](#), para 2.4.

5.1.13. Water activation

Short-circuit during 1 second the water switch sensor contacts of the housing with a metallic conductive device as explained See ["WH \(greatest than 327000\) test procedure"](#), para 5.1.2.6.

- At the end of the test, the led should stop blinking after ≈ 10 seconds.

5.1.14. Control after closing

After closing, perform again the receiving inspection control:

- paragraph 5.1.2.4. Functional control.
- paragraph 5.1.2.5. Test of KANNAD 406 ETS beacon inside container..
- paragraph 5.1.2.6. WH (greatest than 327000) test procedure.

5.1.15. Watertight test, use of the bath**(1) Preparations**

- Bath or adequate container.
- Fresh water.
- Water temperature: $+ 55^{\circ}\text{C} \pm 10^{\circ}\text{C}$.
- Bottle holder.

IMPORTANT: Watertight test is carried out before labelling.

(2) Procedure

- Bring the water to the adequate temperature.
- Check the water temperature (thermometer).
- WH beacons:
 - place a magnet half way down the housing opposite the notch. (see picture hereunder)

Figure 26 : WH beacons, magnet positioning



- Put EPIRB in bottle holder.
- Wholly immerse EPIRB in bath:
Immersion duration: 5 minutes.
 - Remark: free the residual air trapped during the immersion by moving slightly the bottle holder. until total elimination of the air. No bubble should rise thereafter.
 - If bubbles rise, check EPIRB and try again.
- Dry beacon with compressed air.
- Cover bath or receptacle after use.

IMPORTANT: If an electrical heating source is used, its power supply must be switched off while handling in the bath.

5.1.16. Sealing beacon after closing

After closing, seal beacon by applying a wax seal onto the bottom housing locking screw.

5.1.17. Replacement of release device and container closing

CAUTION: before placing the beacon inside the container and closing it, check that all the information regarding the labelling of the beacon and the update of the manual are registered, if not see [paragraph 5.1.18. Document updates](#).

Locking system

Figure 27: Locking system elements



The locking system is composed of:

- (1) a HAMMAR release device,
- (2) a tether,
- (3) a stainless snap hook,
- (4) a severable axis,
- (5) two HU8 nylon nuts,
- (6) a rubber washer.

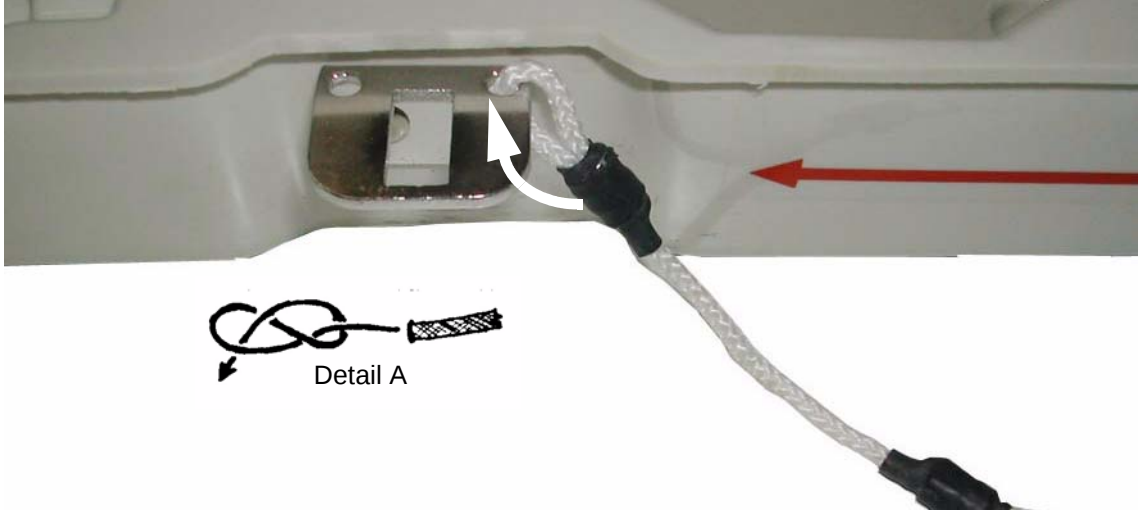
Release device removal

- Unscrew the counter nut and the nut securing the severable axis.
- Remove the severable axis from the well of the release device.
- Lift up the release device as shown hereunder and remove it from the tongue inside which it was inserted.

Figure 28: Release device removal

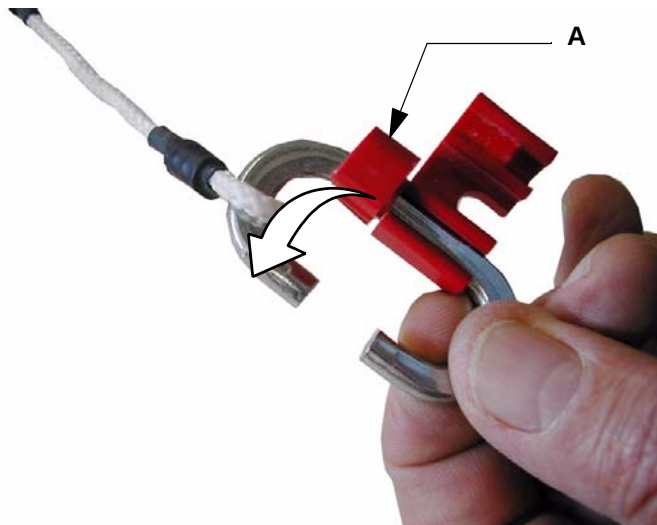


Tether tightening



- Slide the tether through the right hole of the container metal fixing tab (lower housing).
NOTE: slide the tether underneath.
- Make an 8 shaped knot (see Detail A above) at the end of the tether, tighten tightly.

Attaching the tether to the snap hook

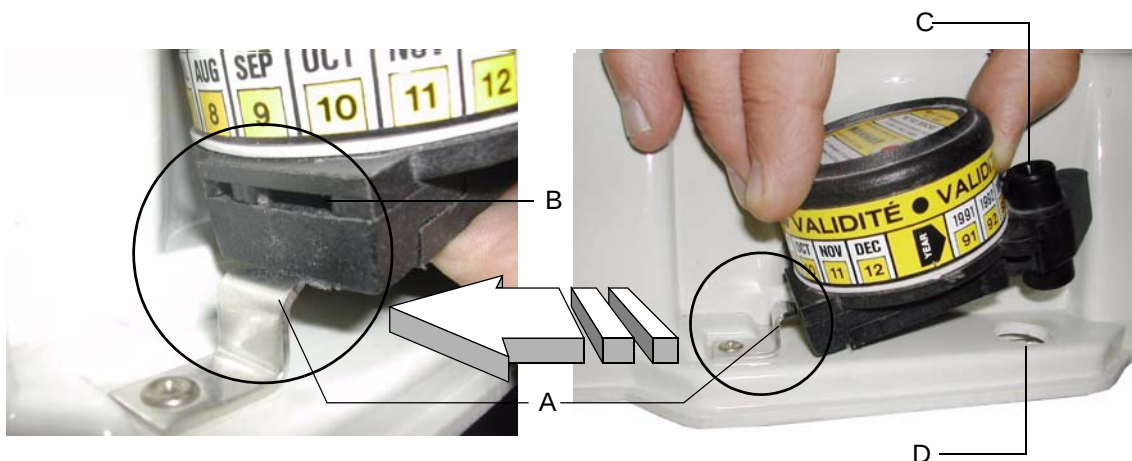


- Slide the side of snap hook holding the smallest hinged flap (A) through the tether loop.
- Pull down the hinged flap (A) onto the snap hook to avoid the loop to come out of the snap hook again.

Release device positioning

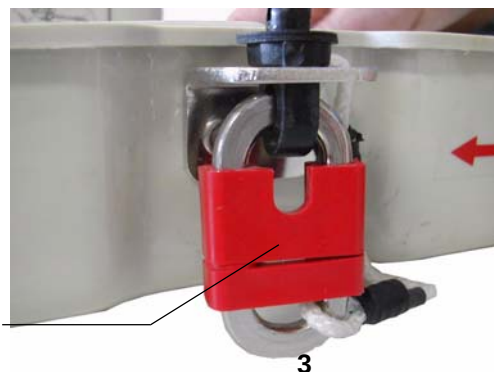
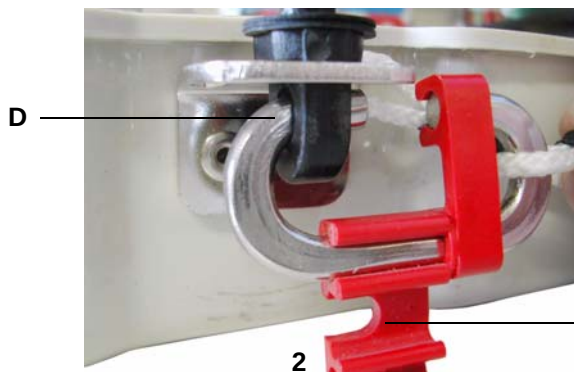
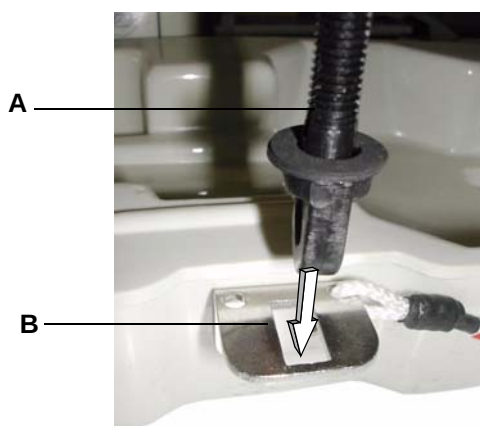
Before positioning the new release device, check mark the boxes (appropriate month and year) of the new validity date (replacement every 2 years).





- Note the release device number and write it on the maintenance record
- Pre-position Hammar release device:
 - insert the tongue (A) of the upper housing into the groove (B) of the Hammar release device,
 - insert the well (C) of the release device into the hole (D) fitted on the upper housing.

Locking



- (1) Insert the severable axis (A) into the groove (B) of the container attach tab (lower housing).

IMPORTANT: Check there is a rubber washer (C) on the screw.

- (2) Slide the snap hook through the hole of the screw head (D).

- (3) Lock the snap hook by pulling down the large hinged flap (E).

Securing the container



1



2

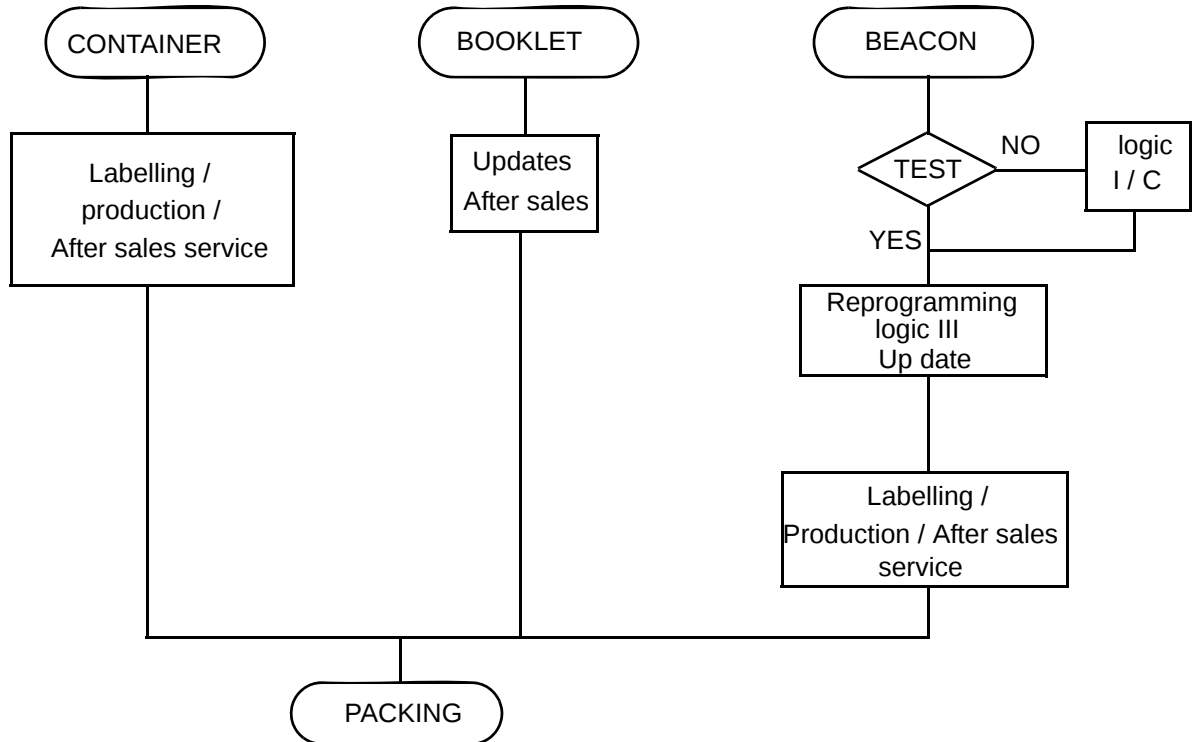


3

- (1) Slide the severable axis (A) into the well (B) of the release device.
- (2) Gently screw the first nylon nut (C) onto the severable axis (A).
Using a torque wrench, tighten the nut (torque = 0.8 N/m) when it comes into contact with the release device.
- (3) Screw the nylon counter nut (D) on the severable axis (A).
Using a torque wrench, tighten the counter nut (torque = 0.8 N/m) while holding the first one with a wrench.

5.1.18. Document updates

Update documents before reconditioning as detailed hereunder.

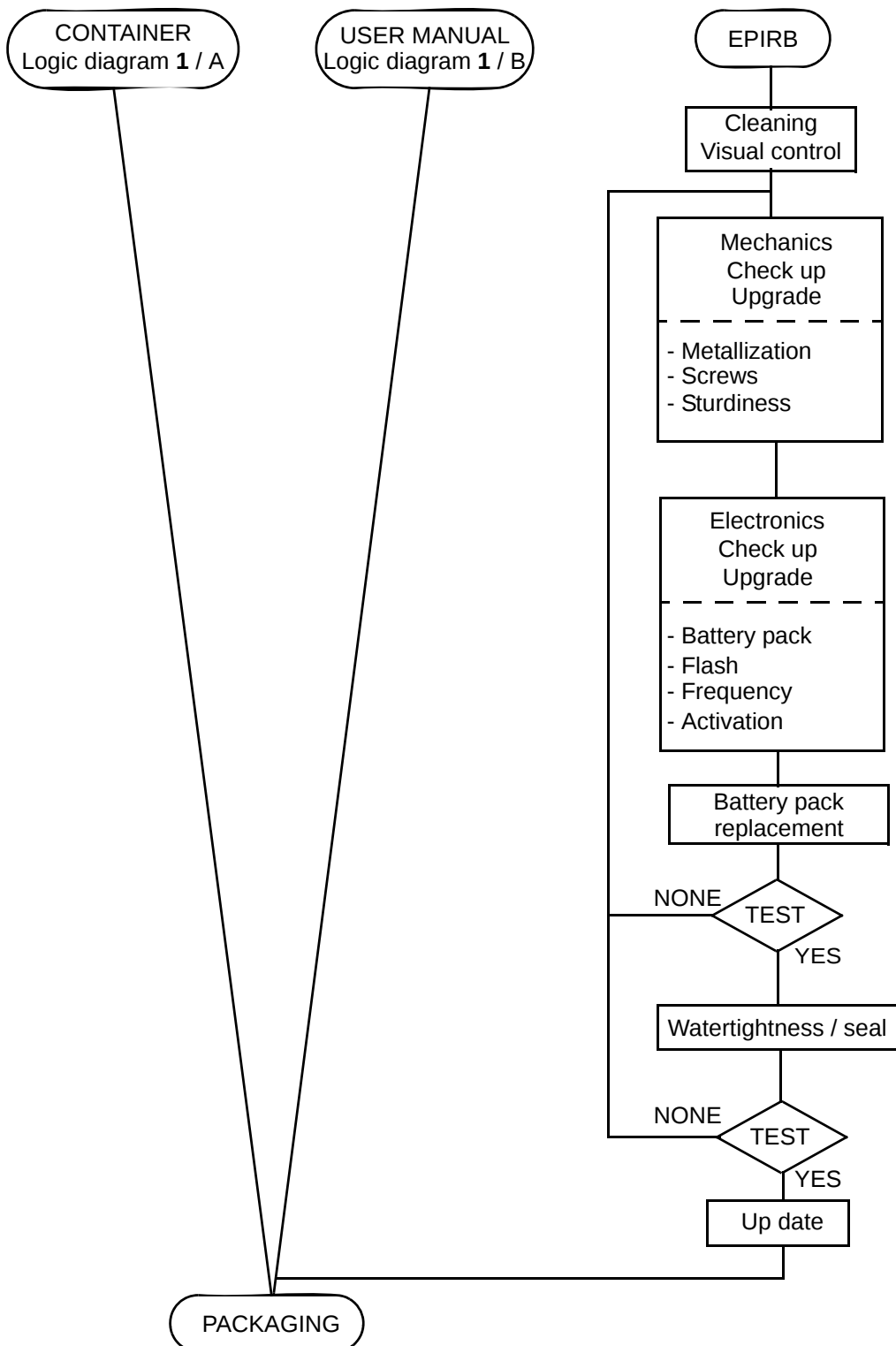


Carry out the administrative inputs (3 copies)

- customer,
- internal copy,
- manufacturer record.

5.2. 4 Check and batteries replacement

Check and batteries replacement: logical diagram 2



5.2.1. Container opening

See [paragraph 5.1.1. Opening Container.](#)

5.2.2. Receiving inspection

See [paragraph 5.1.2. Receiving inspection.](#)

5.2.3. EPIRB opening

See [paragraph 5.1.3. EPIRB opening.](#)

5.2.4. Mechanical checks

See [paragraph 5.1.4. Mechanical checks.](#)

5.2.5. Battery replacement

The battery replacement is to be done with the battery replacement kit S0519525 described [paragraph 7.1. Annex 1: battery replacement kit.](#)

- Open the beacon and remove the electronic unit (see [paragraph 5.1.3. EPIRB opening](#)).
- Replace the battery by a new one (see [paragraph 5.1.5. Battery check](#)).
- Close the beacon (see [paragraph 5.1.12. Beacon closing](#)).
- Perform a watertightness check (see [paragraph 5.1.15. Watertight test, use of the bath](#)).

5.2.6. Control of flash sequence

See [paragraph 5.1.6. Control of flash sequence.](#)

5.2.7. Control of frequencies

See [paragraph 5.1.7. Control of frequencies.](#)

5.2.8. Control of automatic activation

See [paragraph 5.1.8. Control of automatic activation.](#)

5.2.9. Test before reassembly

See [paragraph 5.1.9. Test before reassembly.](#)

5.2.10. Reactivation of protection circuits

See [paragraph 5.1.10. Reactivation of protection circuits.](#)

5.2.11. Control of conductivity

See [paragraph 5.2.11. Control of conductivity.](#)

5.2.12. Beacon closing

See [paragraph 5.1.12. Beacon closing.](#)

5.2.13. Water activation

See [paragraph 5.1.13. Water activation](#)

5.2.14. Control after closing

See [paragraph 5.1.14. Control after closing.](#)

5.2.15. Watertight test

See [paragraph 5.1.15. Watertight test, use of the bath.](#)

5.2.16. Sealing beacon after closing

See [paragraph 5.1.16. Sealing beacon after closing.](#)

5.2.17. Replacement of release device and container closing

See [paragraph 5.1.17. Replacement of release device and container closing.](#)

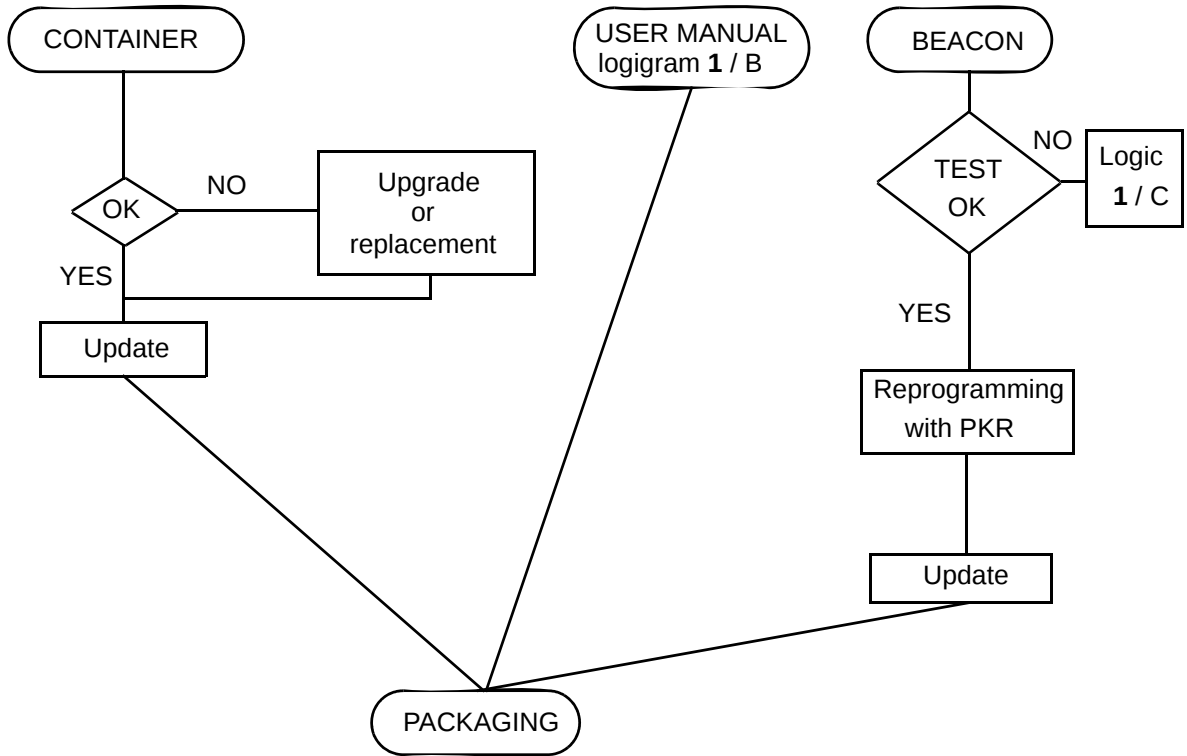
5.2.18. Document updates

See [paragraph 5.1.18. Document updates.](#)

6. MAINTENANCE PROCEDURE

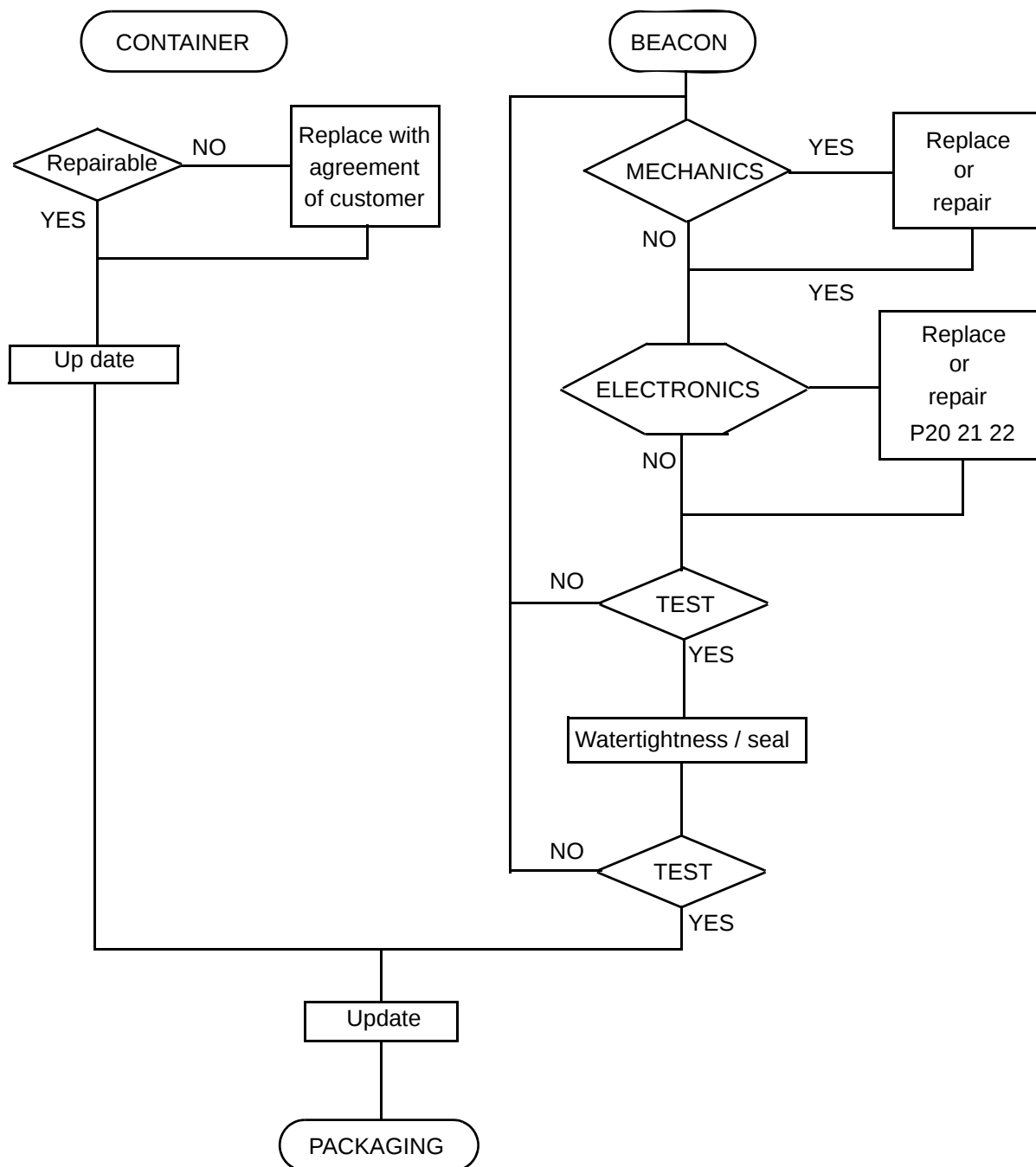
6.1. Re-coding

Logical diagram 3



6.2. Repair

Logical diagram IV



6.2.1. 3rd generation of EPIRBs

Serial Number: from 305 600 to 326999.

I144 PC board or mono type (see [paragraph 7.7. Annex 7: I144 PCB](#)).

Main characteristic: one board only using SMC technology (Surface Mount Technology).

CAUTION: any manual handling on this type of board should be performed with specific SMC tools.

- **BATTERIES:** use SAFT batteries only, original parts type 5101890 (BBA01420) or SARTECH 5101901 (BBA01425) LiMO2. Only available from SERPE IESM.

- For SAFT batteries: check that the voltage is stabilized and is over 12Vdc after 10 seconds on an 8 ohms load. The battery must be declared faulty only if the result is not correct after 3 tests.
- For SARTECH 5101901 (BBA01425) LiMnO₂ batteries: check that the voltage is over 11Vdc after 10 seconds on an 8 ohms load.

- **FREQUENCY ADJUSTMENT:**

Wait 4 minutes to obtain the exact value, then set the beacon in continuous transmission mode:

Correct value: 406,025 MHz $\pm$ 1KHz.

2 types of oscillators:

- DFO 36: adjustment by removal of C57 capacitor. If it is not satisfactory, cut off C56 capacitor.
- EW OS 305: adjustment with P2 compensator RH USO plus frequency adjustment.

- **MAIN POINTS:**

- *406 MHz frequency:*
 - PC1: 406
 - No 406 frequency:
 - Check 12 volts on PT1.
 - Check 5 volts on + of C62 (only if IC6 SOREP, see figure on [paragraph 7.2. Annex 2: Battery replacement modification](#) to locate C62)
 - Check 5.0753125MHz on R115:
 - If no frequency, change IC6.
 - Check Pin 13 of IC7 : 2,2 Vdc $\pm$ 0,1 Vdc. if necessary, adjust with C28 and if not satisfactory, adjust with C21.
 - PC2 :
 - 406 phase modulation:
 - Adjust P1,
 - If the signal is jammed and unstable, remove C45 and C52 (10nF 1206).
 - PC3: task suppressed.
 - PC4: task suppressed.
 - PC5:
 - 406 power:
 - adjust C21.
- *Flash:*
 - PC6:
 - Flash converter fault:
 - remove CR17 (BYD77G),
 - or change IC1 (555).

- ILS:
 - PC7 ILS:
 - Automatic activation failure:
 - Replace ILS by JIN6024 for I144 A/B/C PC boards.
- 121.5 frequency :
 - PC8 121.5
 - To obtain 121.5 MHz $\pm$ 3 KHz ($\pm$ 6 KHz according to specifications):
 - Output power: 10 to 16 dBm (add 5 dBm in continuous wave).
To modify the power, adjust C5 or R3 or replace Q2
 - If the 121.5 MHz sweep range is erratic, change C26 (see [paragraph 7.2. Annex 2: Battery replacement modification](#)).
- PC9:
 - I144D Upgrade:
 - (1) Pressing the test button is not taken into account
 - Modify reset with reset kit 5101932: see [paragraph 7.4. Annex 4: Reset modification](#).
IMPORTANT: This modification shall only be performed on EPIRBS equipped with a I144D board fitted with a I191 or a I266 and only if the default is still present after several checks.
 - (2) Modification when replacing the battery
 - Perform these modifications with replacement kit 5101930: see [paragraph 7.2. Annex 2: Battery replacement modification](#).
- PC10:
 - See [paragraph 7.2. Annex 2: Battery replacement modification](#).
 If the fuse blows during battery replacement:
 - Check if C24, C59, C70 or C104 (for boards C, D) are not short-circuited.
 - Check if L8 has not been damaged by the short-circuit.
 - Replace the damaged fuse by a 4A fuse.
 - Systematically replace the 3 capacitors and remove C71 on board A, B.

6.2.2. 4th generation of EPIRBs

Serial Numbers: 327000 and higher.

PC Board I264 IMO type.

Main characteristic: The EPIRB is fitted with only one board of SMC technology, it is equipped with a water activation device and a test button (also used for programming).

CAUTION:any manual handling on this type of board should be performed with specific SMC tools.

- **BATTERIES:** use SAFT batteries LSH20 type reference 5101937 (BBA1400) or SARTECH batteries reference 5101942 (BBA01417), original part available from SERPE-IESM only.
 - Test:
 - SAFT LSH20: check that the voltage is over 9V after 10 minutes on an 8 ohms load. If necessary, the test must be extended. The battery must be declared faulty if the result is not correct.
 - SARTECH 5101942 (BBA01417) LiMnO₂: Check that voltage is over 11Vdc after 10 seconds on an 8 ohms load.
 - Frequency: one type of oscillator (EWOS 0501) SOREP, SERPE-IESM reference: 0134372.
- **MAIN POINTS:**
 - Power supply 9V 4A, stabilised power supply.
 - Remove STS5 safety.
 - Disconnect the antenna coaxial cable and connect it to the test bench.
 - Check 121.5 continuous wave carrier:
 - J3: strap 5 and 6.
121.5 modulation in normal mode.
 - 406 MHz check:
 - J3: strap 3 and 4.
406 MHz intermittent (ON 7 seconds, OFF 7 seconds).
- **CORRECTIVE:**
 - PC1 in 406:
 - Check regulator outputs:
 - IC9: T18 (5V),
 - IC4: T17 (5V),
 - T38: Check the presence of 10.150625MHz oscillation presence.
 - ST2, A position (open loop):
Used to check amplifier output and tuner.
ST2, B position (closed loop)
Normal mode, 406 stable and correct modulation.
 - If no 406, EPIRB must be return to SERPE-IESM.
 - PC2 in 121.5:
 - IC3: check regulator output in T20 (5V).
If 5 V not OK: adjust C74 capacitor.
 - PC3
 - No flash or flash with an irregular cadence:
Replace with kit 5101939 (see [paragraph 7.5. Annex 5: Flash replacement](#)). Beacon S/N 327000 and higher.
 - Strap the flash power supply ST 4 (see § 3.7.2.).

- PC4:
When shifting in normal mode, the beacon stays permanently in test cycle (i.e. no homing after several transmissions, the beacon loops in test transmission with a cycle less than 50 seconds).
 - open the beacon and connect it to the radio test bench;
 - start the beacon and check that the default is still present;
 - check the battery voltage.
 - If the battery voltage is OK:
 - remove strap ST4, start the beacon and check that:
 - flash does not operate anymore;
 - beacon operate correctly.
 - Replace the flash;
 - strap ST4 (see & [3.7.2.](#)).

6.2.3. Overhaul of metallizing

6.2.3.1. Conduction default or oxidations marks

If a conduction default or oxidations marks are found:

- (1) Remove O-ring of cover with a sharp tool.
- (2) Check the cleanness of groove before applying a new coat of metallized paint (kit of conductive paint).

6.2.3.2. Overhaul of cover and housing plating

- (1) Prepare the plastic to receive a new metallized paint:
Clean the surface to be treated with solvent and brush.
- (2) Apply conductive paint evenly.

IMPORTANT:take care to check also the groove in the cover, the surface around the base of the antenna and the top of the cover.

- (3) Let it dry 10 minutes, check visually and check the conductivity:

- If it is still not satisfactory or if the conductivity is still > 200 ohms, apply another coat.

6.2.3.3. New O-ring replacement

When replacing the new O-ring:

- Do not use a sharp edge tool,
- do not lubricate,
- check conductivity as explained [paragraph 5.1.4.2. Cover control](#) (1)

6.2.3.4. Oxidations marks on cover or housing

If the housing or the cover are too oxidized, replace them:

- Cover
This problem is to be found mainly on beacons with zinc coating. We recommend to replace the cover if traces of oxidation are to be found under the cover gasket and can be seen inside the groove.
If not, scrape it off and apply a new coat of conductive paint.
- Housing
If the marks of oxidation are not too visible inside the cover:
 - scrape them off with sand paper,
 - apply a new coat of paint.

If the beacon coating is made of zinc, apply systematically a new coat of conductive paint.

6.2.4. Use of conductive paint kit**6.2.4.1. Presentation**

The kit is composed of 2 flasks and a brush.

6.2.4.2. Instructions for use

IMPORTANT: firmly close the flasks after each handling.
Do not use a kit which date has expired.

To apply conductive paint, follow the instructions hereunder :

- Mix the paint to avoid a thick deposit at the bottom of the flask (sedimentation of the black metal particles).
- Sample in a clean glass receptacle the required amount of paint.
- Add the same amount of solvent.
- Carefully mix to obtain an homogeneous solution.
- Shake the mixture before each retouching.
- Use clean receptacles to mix solution.
- Clean the brush with solvent and seal the flasks carefully after each use.

IMPORTANT: The solvent contains acetone.
If contact with eyes, rinse abundantly with water.
Do not expose to sunlight.
Storage temperature should not exceed 25°C.
Do not keep within children's reach.

7. ANNEXES

7.1. Annex 1: battery replacement kit

KANNAD 406 beacons with 1 or 2 boards

7.1.1. Kit presentation

Figure 29: Battery replacement kit 5101950

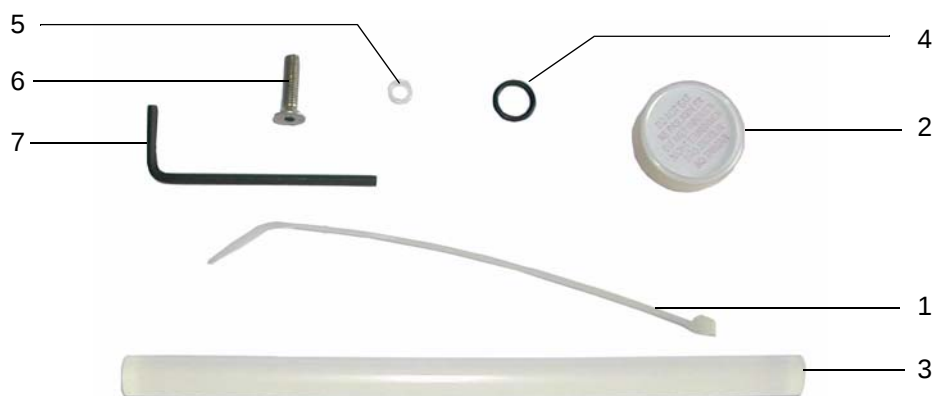


Table 2: Accessories description

DESCRIPTION	Item
Cable clamp	1
Desiccant capsule	2
Stick of glue	3
Antenna O-ring	4
Washer for VMI06065 screw	5
M5 x 20 hexagonal socket screw	6
3mm Allen wrench	7

NOTE: A stick of glue sufficient to stick 20 desiccant capsules is supplied every 20 kits; If less than 20 kits are ordered, one stick of glue is also supplied.

7.1.2. Battery pack

IMPORTANT: use SAFT or SARTECH batteries, original part available from SERPE-IESM only.

Figure 30: SAFT batteries pack



Table 3: SAFT batteries characteristics

DESCRIPTION	REF IESM	°C
SAFT battery pack up to S/N 326 999 (with maintenance kit)	5101890 (BBA01420)	-20°C +55°C
SAFT battery pack from S/N 327 000 (with maintenance kit)	5101937 (BBA01400)	-20°C +55°C

Figure 31: SARTECH batteries pack



Table 4: SARTECH batteries characteristics

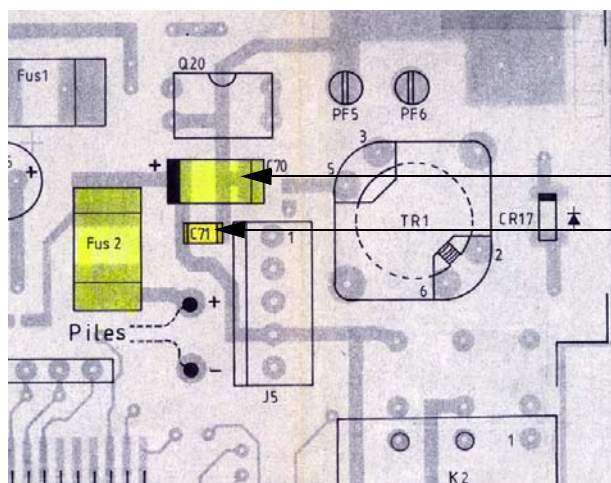
DESCRIPTION	REF IESM	°C
SARTECH battery pack up to S/N 326 999 LiMno2 (with maintenance kit)	5101901 (BBA01425)	-20°C +55°C
SARTECH battery pack from S/N 327 000 LiMno2 (with maintenance kit)	5101942 (BBA01417)	-20°C +55°C

7.2. Annex 2: Battery replacement modification

These modifications have to be performed when replacing a battery on a beacon with a serial number between **305 600** to **326 999**:

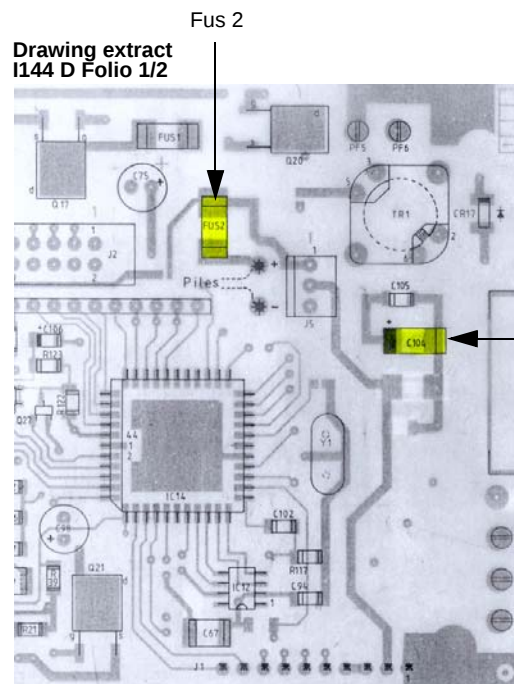
CAUTION: check the expiry date of the beacon.

- 1- Disconnect Epirb power supply
- 2- Replace C24 and C59 with CTC 00360 (1 μ F 35V capacitor supplied with kit S0517620).
Regard for polarity: white stroke = +.
- 3.1- Board I144 A,B,C
Replace C70 with CTC 00561 (4,7 μ F 25V capacitor supplied with kit S0517620).
Regard for polarity: white stroke = +.
- 3.2- Board I144 D,E
Replace C 104 with CTC 00561 (4,7 μ F 25V capacitor supplied with kit S0517620).
Regard for polarity: white stroke = +.
- 4- Check that L8 is not cut (with ohmmeter at self terminal).
If it is cut, replace with TSC 340 (10 μ H SELF supplied with kit S0517620).
- 5- Replace fuse FUS2 with OFU4202 (Fuse 4A supplied with kit S0517620).
- 6- Remove C71 from board I144 A,B.

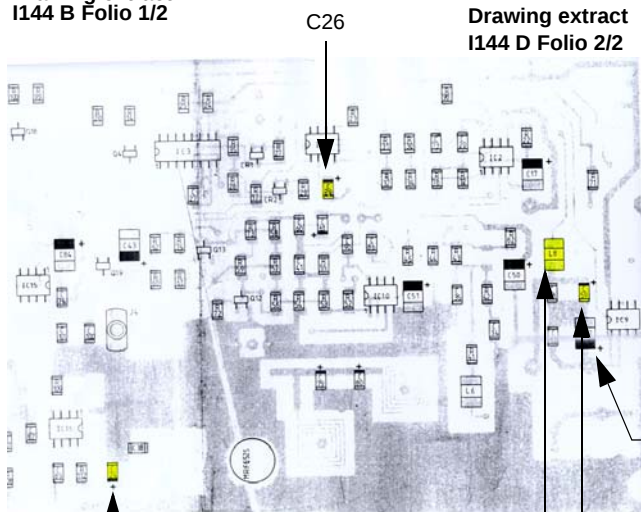


Drawing extract
I144 B Folio 1/2

Drawing extract 041.17.301 Folio 1/2 et Folio 2/2



Drawing extract
I144 D Folio 1/2



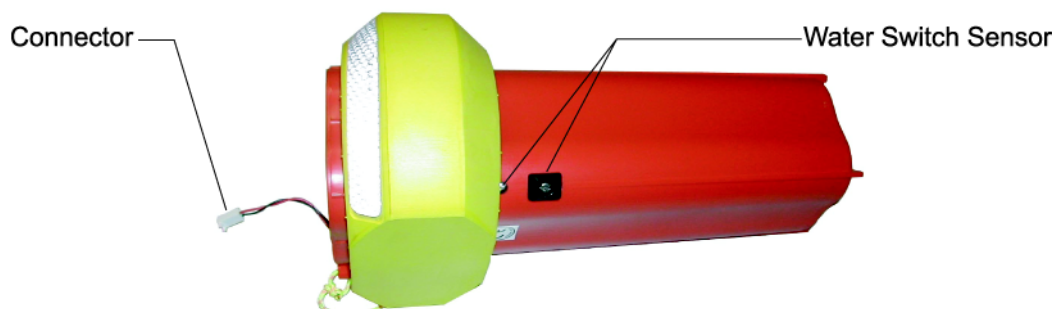
Drawing extract
I144 D Folio 2/2

7.3. Annex 3: WSS procedure level 4

7.3.1. Generalities

The Water Switch Sensor (WSS) is made up of 2 sensors located on the KANNAD 406 WH housing. A connector and 2 wires link the WSS to PC board (I264).

Figure 32: Water Switch Sensor View

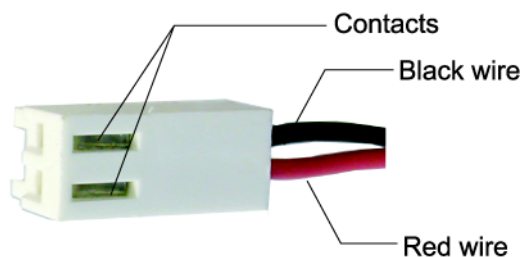


7.3.2. Necessary equipment

The necessary equipment used to replace the Water Switch Sensor is available in S0519519A KIT.

7.3.3. Control of connector

Figure 33: Connector

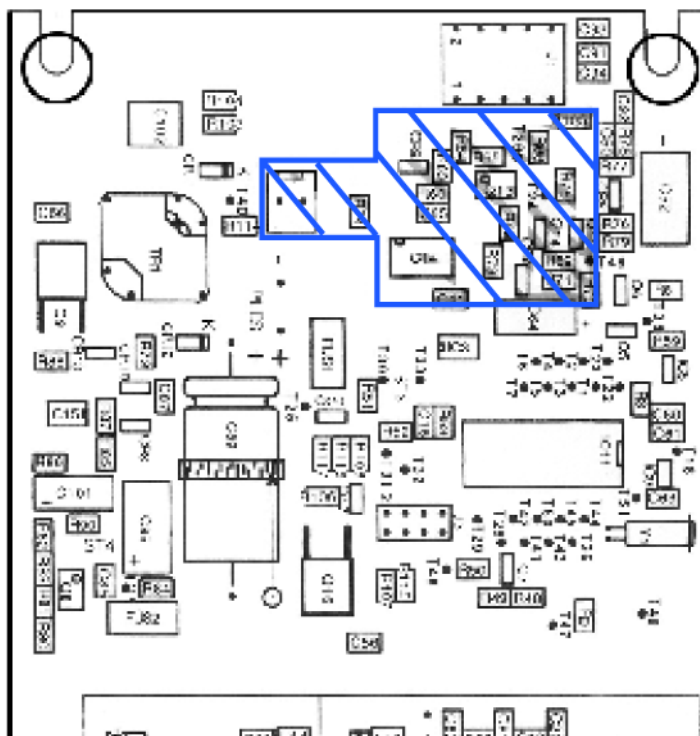


- Disconnect the connector from PC board I264.
- Check that the wires are correctly positioned as shown figure above.
- If the wires are inverted, position them correctly:
 - press down on the contacts of the wires with a sharp tool and pull the wires out,
 - correctly position and plug in the wires into the connector as shown [Figure 33](#),
 - slightly pull out the wires to check if they are correctly plugged in.

7.3.4. PC board protection

NOTE: concerns only I264A, B, C and D PC boards.

Figure 34: I264 PC Board



Apply Dow Corning⁽¹⁾ on the cross hatched part of PC board I264 as shown on [Figure 34](#), let dry 3 hours keeping the PC board in horizontal position.

(1) Available in 5101947 KIT.

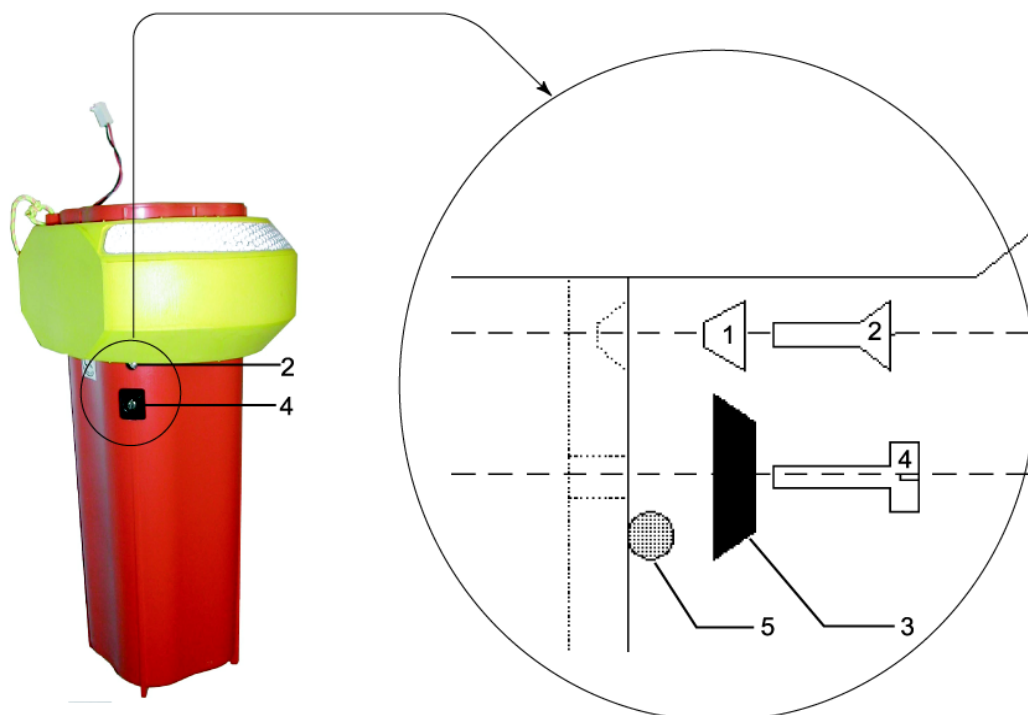
7.3.5. Water switch sensor replacement

7.3.5.1. Case of replacement

The Water Switch Sensor must be replaced if it is not of black color.

7.3.5.2. WSS replacement procedure

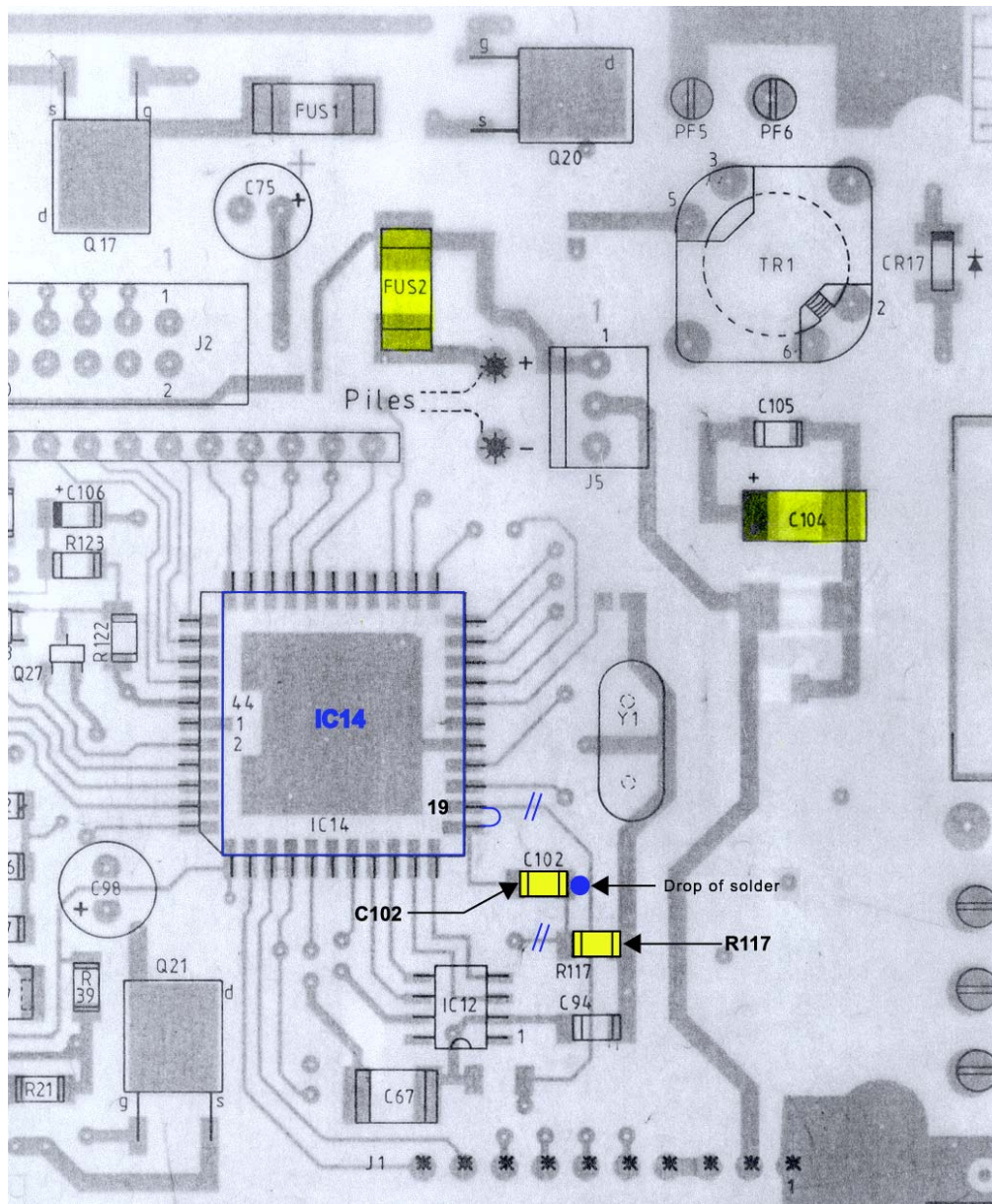
Figure 35: WSS replacement



- Disconnect from the PC board the connector which connects the WSS to the PC board.
- Check the value of the resistance between contacts 2 and 4 of WSS:
 - resistance $\neq \infty$: change the housing,
 - resistance $= \infty$: change the WSS.
- Unscrew screws 2 and 4 and remove the WSS already in place.
- Use dry compressed air at low pressure to remove any dust inside the holes.
- Clean the housing with a rag dampened with Isopropyl alcohol.
- Put screw 4 through the black protection 3, screw it letting it overlap.
- Put a drop of "Super Glue" between black protection 3 and the housing (reference 5), keep the protection into place during a few seconds.
- Remove screw 4 and put Dow Corning in housing two holes.
- Put screw 4 through the black protection 3, screw it (tightening torque: 15 cNm) while maintaining the black protection.
- Put screw 2 through gasket 1, screw it into place (tightening torque: 50 cNm).
- Clean metal parts (contacts 2 and 4) with a rag and dry compressed air at low pressure.
- Re-connect the connector to the PC board and close the beacon.
- Check the value of the resistance between contacts 2 and 4 of WSS:
 - resistance should be ≈ 0 .

7.4. Annex 4: Reset modification

These modifications have to be performed on beacons with a serial number between **317225** to **326 999** and only in case of reset fault (see [paragraph 6.2.1. 3rd generation of EPIRBs](#), PC9).



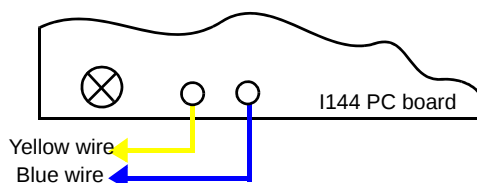
- 1- **TURN EPIRB OFF**
- 2- Make a strap (drop of solder) between track coming from 19 of IC14 and track going from C102 to R117.
- 3- Cut the track coming from 19 of C14 before strap made in 2-.
- 4- Make a strap (drop of solder) between tracks 18 and 19 of IC14.
- 5- Cut the track coming from R117 to the closest bushing.
- 6- Replace R117 by RCH00221 (47 Kohms supplied with kit).

From diagram 041.17.301 Fo1/2

7.5. Annex 5: Flash replacement

7.5.1. Flash replacement on beacons 305600<SN<326999

- (1) Disassemble the equipped cover unit
- (2) Disconnect and remove the battery,
- (3) disconnect the switch connector,
- (4) disconnect the push button connector,
- (5) disconnect the antenna coaxial,
- (6) unsolder, on I144 PC board bump contacts, the wires connected to the flash and the links connected to I161 PC board,
- (7) unscrew and remove screws and nuts of I144 and I246 PC boards. Keep spacer sleeves associated together,
- (8) Remove PC boards, gently pull out wires, just enough in order to slide a spanner used to remove the nuts of flash (5.5 and 8 mm spanner),
- (9) Remove nuts and associated washers of flash,
- (10) Remove the flash and its gaskets, clean the gaskets (re-usable, do not throw away),
- (11) Reassemble a new flash using the old cleaned gaskets,
- (12) Set the flash with the corresponding nuts, tighten till the flash is flattened against the cover and correctly kept: do not strongly tighten.
- (13) Reassemble PC boards, then screw the corresponding nuts and screws (check the wires are correctly placed and not damaged),
- (14) Re-connect push button and switch connectors,
- (15) Re-assemble (gently tightening) the plug of the antenna coaxial cable (6 mm flat spanner),
- (16) Solder the links of I161 PC board and the wires of flash on the corresponding bump contacts of I144 PC board (see drawing hereunder),

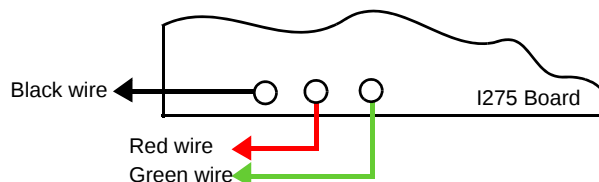


IMPORTANT: Do not heat soldering points, clean soldering excess.

- (17) Re-assemble and connect the battery,
- (18) Check the EPIRB test sequence and flash by pressing the TEST push button,
- (19) Re-assemble EPIRB,
- (20) Check the EPIRB in a Faraday box,
- (21) Perform watertight test according to [paragraph 5.1.15. Watertight test, use of the bath.](#)

7.5.2. Flash replacement on beacons 305600<SN<326999

- (1) Disassemble the equipped cover unit,
- (2) Disconnect and remove the battery,
- (3) Unsolder the 3 wires of I275 PC board (see drawing hereunder),



- (4) Remove nuts and associated washers of flash (5.5 and 8 mm spanner),
- (5) Remove the flash and its gaskets, clean the gaskets (re-usable, do not throw away),
- (6) Reassemble a new flash using the old cleaned gaskets,
- (7) Set the flash with the corresponding nuts, tighten till the flash is flattened against the cover and correctly kept: do not strongly tighten.
- (8) Solder the 3 wires of I275 PC board (see drawing hereunder),
- (9) Re-assemble and connect the battery,
- (10) Check the EPIRB test sequence and flash by pressing the TEST push button,
- (11) Re-assemble EPIRB,
- (12) Check the EPIRB in a Faraday box,
- (13) Perform watertight test according to [paragraph 5.1.15. Watertight test, use of the bath.](#)

7.6. Antenna (or Antenna O-ring) replacement

7.6.1. Antenna disassembly

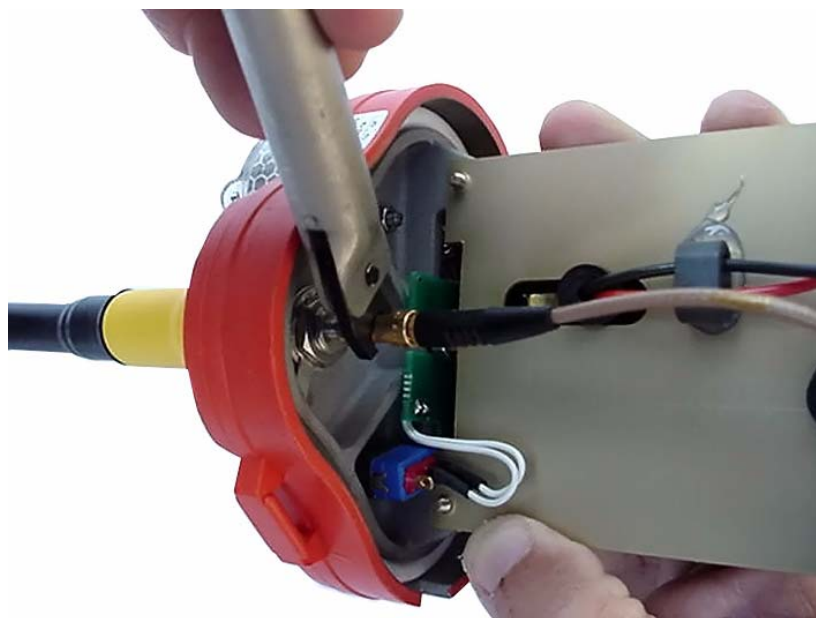
TOOLING:

- 6mm flat wrench.
- 13 mm ring spanner.
- Adjustable joint pliers (recommended model : FACOM FRANCE N° 4101).
- Absorbent cotton-wool.

PROCEDURE:

- Open EPIRB and remove electronic unit ([Refer to 5.1.3.](#)).

Figure 36: Antenna disassembly



- Disconnect the coaxial cable with a 6mm flat wrench.
- Remove the internal nut with a 13mm ring spanner.
- Pull the antenna out of cover.
- Clean the antenna cavity with an absorbent cotton-wool.
- Replace the antenna.

Figure 37: Antenna O-ring replacement

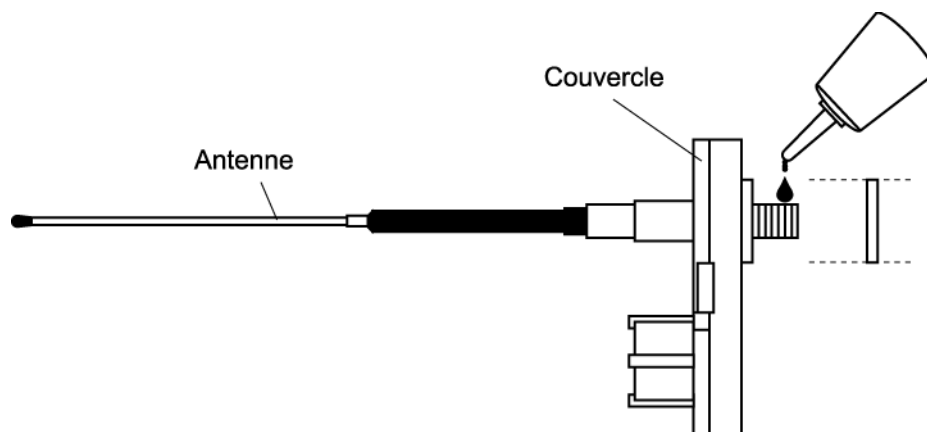


- Replace the O-ring located at the base of the antenna.
- Lubricate the threaded base of the antenna and the gasket.

7.6.2. Antenna assembly

(1) Put the antenna onto the electronic unit cover

Figure 38: Fitting the antenna

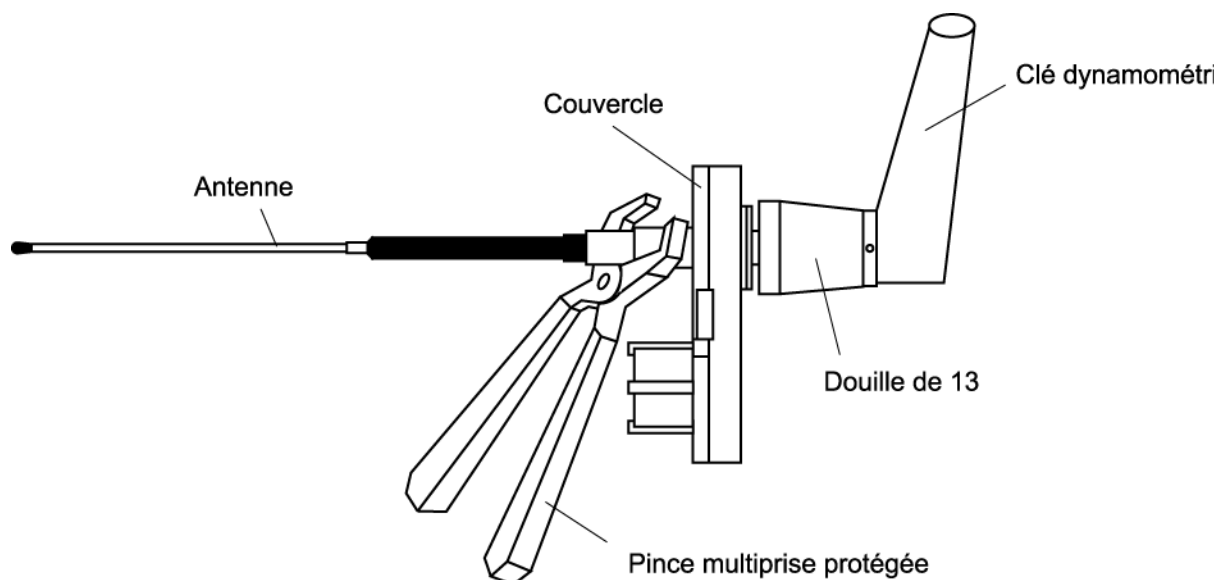


- Put the 2 washers onto the antenna, then put a drop of thread locker glue (Loctite 243, SERPE-IESM reference 0123939) on the antenna thread before tightening the nut.

IMPORTANT: Take care not to put any glue on the thread used for the VHF cable.

(2) Tighten the nut.

Figure 39: Antenna nut tightening



- Tighten the nut with a torque wrench fitted with a 13 mm socket (**torque = 2.3 Nm**) and an adjustable pliers (**pliers must be protected by a plastic protection to avoid damage to the antenna**).

(3) Tighten the coaxial

IMPORTANT: Torque = 30 N.cm ± 5N.cm.

To ensure that the antenna coaxial cable plug is correctly tightened, it is recommended to use a torque setting wrench (Refer to Figure 36 and Figure 39) to obtain correct tightening torque. This avoids misshaping or damaging the plug.

Wrench reference: RADIAL R282318 (6 mm flat wrench).

7.7. Annex 7: I144 PCB

