

USERS MANUAL



Tron 60S
Tron 60GPS



www.jotron.com



AMENDMENT RECORDS

Amendment no	By	Date	Page(s)	Vers.	Reason for change
1	TH	23.12.2010	Total 32	A	New Manual
2	TH	25.02.2011	Ch. 3.1.2	B	Changed battery info
3	TH	18.04.2011	Page 13-29	C	Re-arranged pictures/drawings
4	TH	19.09.2011	Page 15, 22-25	D	Info update
5	BR	10.11.2011	Page 24	E	Info update on test
6	TH	20.01.2012	Page 16-18, 30	F	Update text and images
7	ØE	08.02.2012	6,16, 18, 20, 22 and 24	G	Update text
8	TH			H	Text and pictures
9	FIT	22.05.2012	6, 12, 16, 18, 26, 29-30	I	Updated text
10	BR	26.06.2012	6, 16	J	Battery info and EPIRB registration
11	ØE	16.10.2012	15-16	K	EPIRB registration
12	ØB	29.11.2019	26, 35	L	New layout Minor adjustments Placard on p.35

EC Declaration of Conformity, available at www.jotron.com

ABBREVIATIONS AND DEFINITIONS

BAUD

Transmission rate unit of measurement for binary coded data (bit per second)

BIT

Short form of Binary Digit. The smallest element of data in a binary-coded value

BPS

Bits Per Second

COSPAS

COsmicheskaya Sistyema Poiska Avariynich Sudov (Space System for the Search of Vessels in Distress)

EPIRB

Emergency Position Indicating Radio Beacon

GLOBAL POSITIONING SYSTEM (GPS)

The NAVSTAR Global Positioning System, which consists of orbiting satellites, a network of ground control stations, and user positioning and navigation equipment. The system has 24 satellites plus 3 active spare satellites in six orbital planes about 20,200 kilometers above the earth.

IEC

International Electro-technical Commission

IMO

International Maritime Organization

IBRD

International 406MHz Beacon Registration Database

ITU

International Telecommunication Union



LED

Light Emitting Diode

LUT

Local User Terminal (Ground Station)

MCA

Marine and Coastguard Agency (UK)

MCC

Mission Control Centre

NOAA

National Oceanic and Atmospheric Administration (USA)

RCC

Rescue Coordination Centre

SARSAT

Search and Rescue Satellite-Aided Tracking System

SBM

Shore Based Maintenance – as required by SOLAS regulation IV/15.9.2 of SOLAS 1974 as amended with, in accordance with MSC/Circ. 1039 guidelines for Shore-Based Maintenance (SBM) of Satellite EPIRBs within 5 years if:

Passenger ships (> 12 passengers) and cargo ships (> 300GT) engaged in International voyages, shall perform SBM as follows:

- Latest by the date of the EPIRB label with this text, or the battery Label, whichever is first.
- When this EPIRB becomes due for SBM in accordance with national requirements.

VHF

Very High Frequency -A set of frequencies in the 30-300MHz region.



IMPORTANT

The information in this book has been carefully checked and is believed to be accurate. However, no responsibility is assumed for inaccuracies.

This equipment contains CMOS integrated circuits. Observe handling precautions to avoid static discharges which may damage these devices. Jotron AS reserves the right to make changes without further notice to any products or modules described herein to improve reliability, function or design. Jotron AS does not assume any liability arising out of the application or use of the described product.

WARNING / IMPORTANT

Jotron AS is a prime manufacturer of safety equipment designed for rescue of human lives and their property. For safety equipment to be effective in line with the design parameters it is important that they are handled, stowed and maintained in compliance with the manufacturers instructions. Jotron AS can not be held responsible for any damage caused due to incorrect use of the equipment or breach of laid down procedures or for failure of any specific component or other parts of the equipment.

The chapter covering battery replacement is added for information only. Jotron AS does not take any responsibility for improper disassembling/assembling of the beacon. We strongly recommend all service to be done by authorized Jotron AS agents. In addition to normal service, Jotron AS agents have the necessary equipment and education to test the operational functions of the beacon. Non-original maintenance and/or service parts may destroy the equipment function and performance.



BATTERY SAFETY DATA SHEET

PRODUCT NAME:	Energizer Battery
TYPE NO.:	L91 Volts: 1.5
TRADE NAMES:	ULTIMATE (L91)
APPROXIMATE WEIGHT:	14.5 g
CHEMICAL SYSTEM:	Lithium/Iron Disulfide
DESIGNED FOR RECHARGE:	No

HAZARDS IDENTIFICATION

Under normal conditions of use, the battery is hermetically sealed.

Ingestion: Swallowing a battery can be harmful.

Inhalation: Contents of an open battery can cause respiratory irritation.

Skin Contact: Contents of an open battery can cause skin irritation.

Eye Contact: Contents of an open battery can cause severe irritation.

FIRST AID MEASURES

Ingestion: Do not induce vomiting or give food or drink. Seek medical attention immediately. CALL NATIONAL BATTERY INGESTION HOTLINE for advice and follow-up (202-625-3333) collect day or night.

Inhalation: Provide fresh air and seek medical attention.

Skin Contact: Remove contaminated clothing and wash skin with soap and water.

Eye Contact: Immediately flush eyes thoroughly with water for at least 15 minutes, lifting upper and lower lids, until no evidence of the chemical remains. Seek medical attention.

Note: Carbon black is listed as a possible carcinogen by International Agency for Research on Cancer (IARC).

FIRE FIGHTING MEASURES

In case of fire where lithium batteries are present, flood area with water or smother with a Class D fire extinguishant appropriate for lithium metal, such as Lith-X. Water may not extinguish burning batteries but will cool the adjacent batteries and control the spread of fire. Burning batteries will burn themselves out. Virtually all fires involving lithium batteries can be controlled by flooding with water. However, the



contents of the battery will react with water and form hydrogen gas. In a confined space, hydrogen gas can form an explosive mixture. In this situation, smothering agents are recommended. A smothering agent will extinguish burning lithium batteries.

Emergency Responders should wear self-contained breathing apparatus. Burning lithium-iron disulfide batteries produce toxic and corrosive lithium hydroxide fumes and sulfur dioxide gas.

HANDLING AND STORAGE

Storage: Store in a cool, well ventilated area. Elevated temperatures can result in shortened battery life. In locations that handle large quantities of lithium batteries, such as warehouses, lithium batteries should be isolated from unnecessary combustibles.

Mechanical Containment: If potting or sealing the battery in an airtight or watertight container is required, consult your Energizer Battery Manufacturing, Inc. representative for precautionary suggestions. Do not obstruct safety release vents on batteries. Encapsulation of batteries will not allow cell venting and can cause high pressure rupture.

Handling: Accidental short circuit for a few seconds will not seriously affect the battery. Prolonged short circuit will cause the battery to lose energy, generate significant heat and can cause the safety release vent to open. Sources of short circuits include jumbled batteries in bulk containers, metal jewelry, metal covered tables or metal belts used for assembly of batteries into devices. Damaging a lithium battery may result in an internal short circuit.

- The contents of an open battery, including a vented battery, when exposed to water, may result in a fire and/or explosion. Crushed or damaged batteries may result in a fire.
- If soldering or welding to the battery is required, consult your Energizer representative for proper precautions to prevent seal damage or short circuit.

Charging: This battery is manufactured in a charged state. It is not designed for recharging. Recharging can cause battery leakage or, in some cases, high pressure rupture. Inadvertent charging can occur if a battery is installed backwards.

Labeling: If the Energizer label or package warnings are not visible, it is important to provide a package and/or device label stating:



- WARNING:

Battery can explode or leak and cause burns if installed backwards, disassembled, charged, or exposed to water, fire or high temperature. Where accidental ingestion of small batteries is possible, the label should include:

- WARNING:

(1) Keep away from small children. If swallowed, promptly see doctor. Battery can explode or leak and cause burns if installed backwards, disassembled, charged, or exposed to water, fire or high temperature.

TEST AND MAINTENANCE RECORD

DATE	N/T/B	SIGN	INSP

N= New EPIRB installed, T= Test, B= New battery

TEST OF RADIO EQUIPMENT

Monthly:

Float-free and manual EPIRBs to be checked using the means provided for testing on the equipment. Check data for periodical maintenance requirement for float-free EPIRB.

False alerts transmitted by EPIRB

False alerts are a serious problem for the rescue service. Nearly 90% of EPIRB initiated distress alerts turn out to be false alarms.

If for any reason, your EPIRB should cause a false alarm, it is most important that you contact the nearest search and rescue authority and tell them it was a false alarm. They can then stand down any rescue service (coast radio station or appropriate CES or RCC). Use any means at your disposal to make contact.



Switch off the distress alarm by de-activating your EPIRB, as soon as possible.

If your beacon is activated in a non-distress situation or a distress situation which has been resolved and you no longer require assistance, contact the nearest search and rescue authorities via the most expeditious means available with the following information:

- Beacon ID number (15 character UIN):
- Position (At time of activation):
- Date of Activation:
- Time of Activation (Time zone):
- Duration of Activation:
- Beacon make and model:
- Vessel Name/ID:
- Circumstances/cause (if known):

USA

The United States search and rescue authority is the U.S. Coast Guard. The primary points of contact are:

Pacific Ocean Area
USCG Pacific Area Command Centre
Tel: +1 (510)-437-3701

Atlantic Ocean / Gulf of Mexico Area
USCG Atlantic Area Command Centre
Tel: +1 (757)-398-6231

From Any Location
USCG Headquarters Command Centre
Tel: +1 (800)-323-7233



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1 GENERAL DESCRIPTION

The Tron 60S/GPS is emergency equipment consisting of:

- Tron 60S/GPS Cospas-Sarsat emergency EPIRB
- One of the following brackets:
- FB-60 - Automatic float free bracket.
- MB-60 - Manual bracket.

The Tron 60S/GPS EPIRB is developed to meet the regulations and rules for use on vessels and life rafts in the maritime service. Tron 60S/GPS meets the following specifications for 406 MHz EPIRBs for use in search and rescue operations at sea.

See “Declaration of Conformity” document at www.Jotron.com for information of required standards.

1.1 TRON 60S/GPS

The Tron 60S/GPS is buoyant and have water activated contacts which will start DISTRESS transmission if deployed into water. Tron 60S/GPS are currently available with two different brackets, one manual type and one float free version. Both type of brackets prevents DISTRESS transmission if water spray are applied to the EPIRBs.

The Float free bracket, FB-60 is a covered bracket with an hydrostatic release unit (HRU) which will release the Tron 60S/GPS if the bracket is submerged to a depth of 2-4 meters if the ship are about to sink.

The Manual bracket, MB-60 is a simple bracket for those ships which does not need a float free version, or for those in need of an additional manual EPIRB in the wheelhouse as required by some national administrations. The manual bracket will also be used as a shipment bracket when Jotron send replacement units to customers.

The purpose of the Tron 60S/GPS is to give a primary alarm to the search and rescue authorities. The EPIRB gives an immediate alarm when activated, transmitting the ID of the ship in distress. Care must be taken not to activate the EPIRB unless in an emergency situation, in such cases the user will be held responsible. For periodic testing a test function is implemented. During the test cycle the EPIRB does a self-test on the transmitters and on the battery status. No emergency signal is transmitted during the self-test.

The battery of the EPIRB will last for at least 48 hours from activation of the EPIRB.

1.2 SYSTEM DESCRIPTION

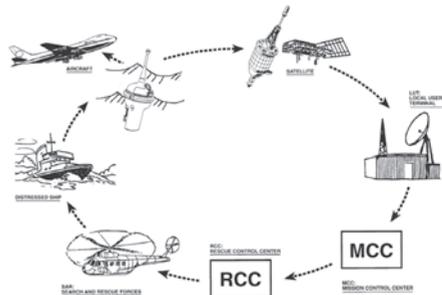
The Cospas-Sarsat system was introduced in 1982 as a worldwide search and rescue system with the help of satellites covering the earth's surface. Since the introduction of the system more than 28000 persons have been rescued by the Cospas-Sarsat system (2009). Currently the system consists of 5 functional satellites in a polar orbit constellation, these satellites cover the entire earth's surface and receive the emergency signal from the 406 MHz transmitter within the Tron 60S/GPS, more polar orbiting satellites will be available in the future, giving a faster location and rescue time.

In addition several geostationary satellites are equipped with a 406 MHz transponder, these satellites are not able to locate the Tron 60S/GPS but will give an early warning to the rescue forces, minimising the time from an emergency occurs till the rescue forces are at the site.

Each emergency EPIRB in the system is programmed with its own unique code, therefore it is vital that the ships data that is given to the dealer you obtained your Tron 60S/GPS, is correct. It is also important that your EPIRB is registered in the database for each country. This database is normally located in the same country that the ship is registered.

1.2.1 SIGNAL DETECTION

When the Tron 60S/GPS is activated (manually or automatically) it transmits on the frequencies 121.5 MHz and 406.037 MHz. An analogue signal is emitted on 121.5 MHz and a digital signal is transmitted on 406.037 MHz. After the Tron 60S/GPS is activated, the next passing satellite will detect the transmitted signal and relay it to an antenna at a ground station, called LUT.



The International Cospas-Sarsat System has ceased satellite processing of 121.5/243 MHz beacons from 1 February 2009.

1.2.2 DISTRESS LOCATION DETERMINATION



The location of the distress signal is determined by taking measurements of the doppler shift of the EPIRB frequency when the satellite first approach and then pass the EPIRB.

The actual frequency is heard at the time of closest approach (TCA). Knowing the position of the satellite and using the received doppler signal information, it is possible to determine the location of the Tron 60S/GPS from the satellite at the TCA. At the LUT, actually two positions are calculated. One is the actual position (A) and the other is the mirror image (B) position. A second satellite pass confirms the correct location (A). Doppler-only accuracy is within 5 km (3 mi) (3.1 statute miles or 2.6 nautical miles)— that is, the position is sufficiently accurate for SAR purposes even after only one pass. What’s more, the most likely of the two ‘mirror’ positions can be determined valid with 98.5% accuracy after only one satellite pass. This accuracy can be increased to 99.3% using so-called “combined Leo-Geo processing,” and this technique also enables accurate positions to be generated with as little as two or three bursts from the beacon (i.e. less than 4 minutes of transmission) and thus greatly increases the chances of being found even if the beacon is ultimately consumed by fire or is otherwise destroyed.

1.2.2.1 GPS ADVANTAGE

	Polar orbiting satellites (LEOSAR)	Geostationary satellites (GEOSAR)
Tron 60S	Delayed alert (<90 min) Position by Doppler (5km)	Immediate alert (<5 min) NO position
Tron 60GPS (MMSI Standard Location Protocol Long)	Delayed alert (<90 min) Position by GPS (120m)	Immediate alert (<5 min) Position by GPS (120m)
	Longer delay, Low resolution position	Fast alert and accurate position



Tron 60GPS has been designed to operate with the Cospas-Sarsat system and will enhance further the lifesaving capabilities of conventional beacons.

Please see below comparison between Tron 60S and Tron 60GPS depending on detection by polar orbiting or geostationary satellites.

GPS position is updated every 5 minutes, and can also be tested in SELF TEST (On previous models, position updates was only allowed every 20 minutes and NOT allowed to be tested in SELF TEST).

1.2.3 EPIRB REGISTRATION

Normally the MCC will contact the vessel or the contact person registered in a shipping register and/or an EPIRB register (Ships owner, family member etc.) before alerting the RCC. This is to determine if the alarm from the EPIRB for some reason is a false alarm, and an expensive rescue operation can be avoided. Because of this it is important that the ships data is correct in the shipping register or in the EPIRB database.

You should register your beacon with the national authority associated with the country code in the hexadecimal identification (15 Hex ID) of your beacon. You can register your beacon online with the Cospas-Sarsat IBRD if your country does not provide a registration facility and your country has allowed direct registration in the IBRD: www.406registration.com

If your country operates a national beacon registry, consult the document C/S S.007 "Cospas-Sarsat Handbook of Beacon Regulations" available at www.cospas-sarsat.org to obtain the point of contact.

Some EPIRB registration links:

USA: <http://www.beaconregistration.noaa.gov>

UK: <http://www.mcga.gov.uk> (search for "EPIRB registration")



USA REGISTRATION CARD

For registration of the beacon, use this link:

<http://www.beaconregistration.noaa.gov>

Follow instructions you see on your screen.

Other registrations methods are mail or fax. Forms are ready with correct information and it may be downloaded from the above web site.

The Emergency Contact information has to be accurate, especially regarding the telephone number, as this will be used to validate an alert. Only if the beacon registration and approximate location details can be confirmed will USCG (United States Coast Guard) launch an immediate rescue, otherwise there will be a delay whilst further alerts from the same source are received and verified.

Registration address:

NOAA/SARSAT Beacon Registration
E/SP3
Federal Building 4, Room 3320
5200 Auth Road, Suitland,
MD 20746-4304.



WARNING: The EPIRB can drop out of the bracket when releasing front cover of the bracket.

OPERATION

Full pin from release rod above to remove cover, detach cover with caution.
For normal activation, deactivation, self-test and suspension of EPIRB please follow instructions on EPIRB.
Category 1 EPIRB will automatically be released from bracket and float free if vessel sinks.

WARNING: THE EPIRB SHALL NOT BE OPERATED EXCEPT IN AN EMERGENCY!

THIS EPIRB IS CATEGORY 1



406/121.5 MHz
SATELLITE
EPIRB

JOTRON
Tron 505
406/121.5 MHz
COBAS/SAR/SAT EPIRB

DISTRESS	TEST
20 Beeps	1 Beep - OK

NOTE: The EPIRB will be automatically deactivated in water.
Procedure: Take out of water. Please switch to "READY" when "Full Test" signal.

TEST: 10 Loud number of beeps according to number shown in upper manual.
OK: Daily test within last 5 min of hour.

WARNING: FOR MARINE DISTRESS USE ONLY. USE ONLY IN EMERGENCY!



2 TECHNICAL SPECIFICATIONS

2.1 GENERAL

Battery:	Lithium/iron disulfide, 12V/2900 mAh, 5 years service life
Housing material:	Glass reinforced Polycarbonate
Dimensions:	
• Weight:	700 gram
• Height:	340 mm
• Max diameter:	128mm
Compass safe distance:	0,85 m
Temperature operating:	-20°C to + 55°C (-4°F to +131°F)
Temperature storage:	-30°C to + 65°C (-22°F to +149°F)
Operating life:	Minimum 48 hours at -20°C

2.2 COSPAS-SARSAT TRANSMITTER

Frequency:	406.037 MHz \pm 2 ppm
Output power:	5W \pm 2 dB
Protocols:	Tron 60S/GPS: Maritime, Serialized, Radio Call sign, Location protocols
Modulation:	Phase modulation 1.1 \pm 0.1 rad
Data encoding:	Bi Phase L
Stability:	Short term: $\leq 2 \times 10e^{-9}$ Medium term: $\leq 10e^{-9}$ Residual noise: $\leq 3 \times 10e^{-9}$ Bit rate: 400 b/s Antenna: Omni directional

2.3 NAVIGATION DEVICE (ONLY TRON 60GPS)

Type:	22 Channel GPS Receiver
Antenna:	Chip type

2.4 HOMING TRANSMITTER

Frequency:	121.500 MHz
Output power:	Up to 100 mW
Modulation:	A9, AM sweep tone between 300Hz and 1600Hz Sweep range: 700 Hz Sweep rate: 2.5 Hz
Stability:	10 ppm over temperature range
Antenna:	Omni directional

2.5 BRACKETS

2.5.1 FLOAT FREE BRACKET FB-60

Materials:	Luran S/ ABS
Dimensions (hwd):	(385 x 151 x 148) cm
Weight:	850 g
Release mechanism:	Jotron HRU kit (part. no. 86218)



2.5.2 MANUAL BRACKET MB-60

Materials:	PA6 + 30% fibre glas (Polyamide)
Dimensions (hwd):	(156x 134 x 98.5) cm
Weight:	150 g



3 EPIRB DESCRIPTION

3.1 GENERAL

The Tron 60S/GPS consists of upper and lower housing mounted together with an equator ring with gasket. Tron 60S/GPS consists of the following main parts:

- Main module with antenna
- Battery pack

3.1.1 MAIN MODULE WITH ANTENNA

The EPIRB module consists of:

- The main board including all electronic circuitry and the main switch
- Antenna with LED flash

3.1.2 BATTERY PACK

The battery supplies the EPIRB module with 12 V power to keep the EPIRB transmitters active for more than 48 hours when activated, and for test sequences. The battery pack is attached inside the lower housing.

The seawater contacts are mounted in the lower housing. The battery cells are mounted in a plastic container.



4 INSTALLATION

WARNING:

DO NOT INSTALL THE EPIRB NEAR STRONG MAGNETIC FIELDS THAT COULD ACTIVATE THE BEACON

4.1 BRACKETS

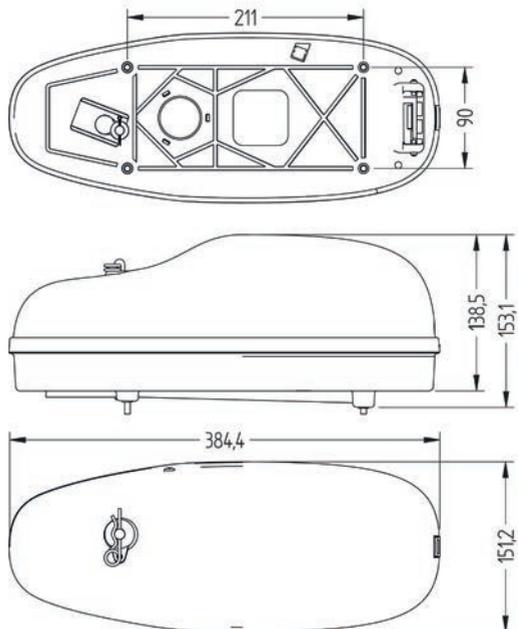
Two different brackets are currently available for the Tron 60S/GPS.

4.1.1 FLOAT FREE BRACKET FB-60

When the Tron 60S/GPS is mounted in the float-free bracket, FB-60, it will operate as an automatic float free unit.

The satellite float-free EPIRB should be located/installed so that the following requirements are fulfilled:

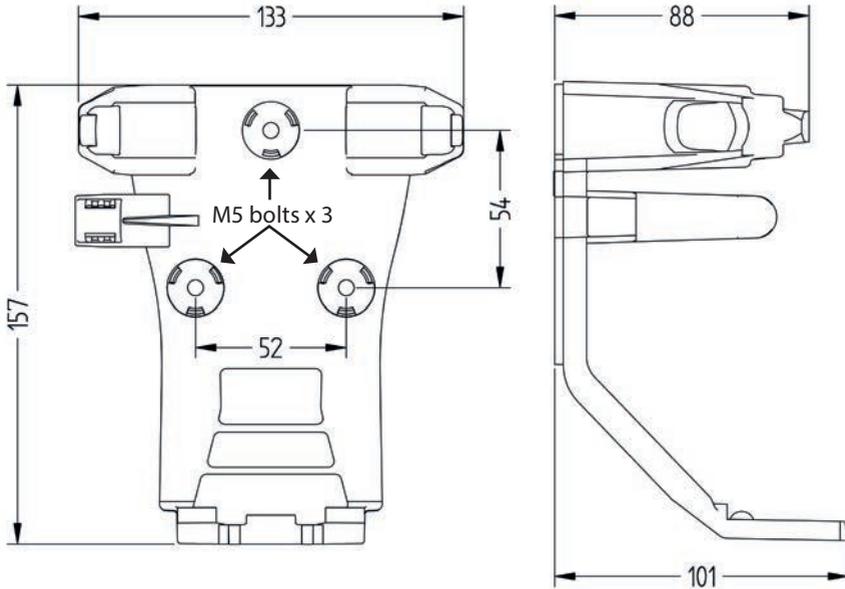
- The EPIRB should, with greatest possible probability, float-free and avoid being caught in railings, superstructure, etc., if the ship sinks.
- The EPIRB should be located so that it may be easily released manually and brought to the survival craft by one person. It should therefore not be located in a radar mast or any other places which can only be reached by vertical ladder.



The location should be well protected from environmental conditions such as direct sea-spray, chemicals, oil, exhaust and vibrations. The bracket shall be mounted as high as possible, but fulfill the above requirements. This will ensure operation of the hydrostatic float-free release unit, in the event of the vessel capsizes without sinking.

4.1.2 MANUAL BRACKET MB-60

When the Tron 60S/GPS is mounted in the MB-60 bracket, it will operate as a manual unit. This bracket is typically used to store the EPIRB inside the wheelhouse or other protected areas of the ship. When the Tron 60S/GPS is mounted in the MB-60 bracket, the EPIRB can be activated as described in 5.1.1, but the sea water contacts are deactivated in the bracket. The bracket should be mounted in an easily accessible place where it can be removed in a hurry in case of an emergency.



4.1.3 MOUNTING THE FB-60/MB-60 BRACKETS

The bracket is mounted with 5mm bolts according to the drawing. The bracket could be mounted in either a vertical or horizontal position, whichever is the best regarding maintenance and operation. A vertical position is recommended.

5 OPERATION INSTRUCTIONS

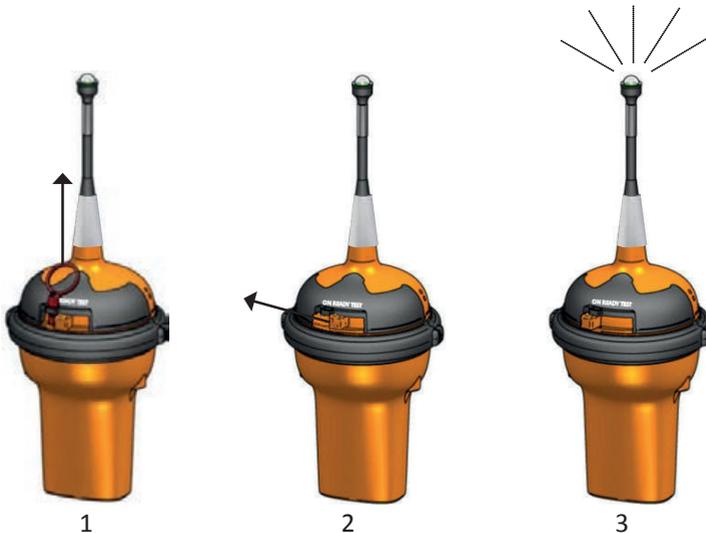
WARNING

- USE ONLY DURING SITUATIONS OF GRAVE AND IMMINENT DANGER
- REPLACE THE BATTERY AFTER THE SATELLITE EPIRB IS OPERATED FOR ANY PURPOSE OTHER THAN A TEST

Tron 60S/GPS is designed to be operated either manually or automatically. The EPIRB is always armed when located in the bracket. The EPIRB will automatically start to transmit when removed or ejected from the bracket and deployed into water. The EPIRB has an internal safety switch which prevents inadvertent activation through moisture, sea spray etc when located in the bracket.

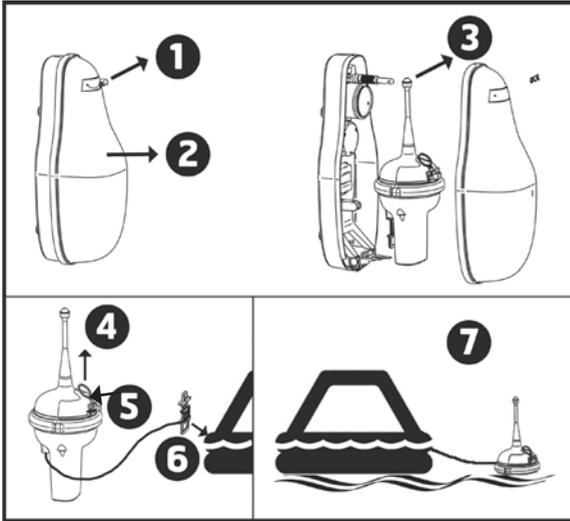
5.1 MANUAL OPERATION

5.1.1 OUT OF BRACKET



Regarding the 3 pictures above, follow instructions from 4-5 on page 23.

5.1.2 FLOAT FREE BRACKET FB-60



WARNING

The EPIRB can drop out of the FB-60 bracket when releasing top cover

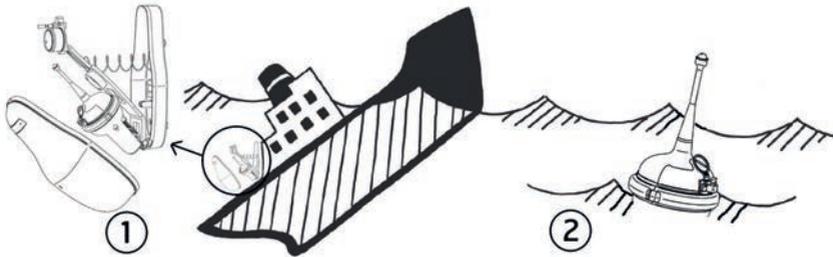
For operation of the beacon in the bracket please follow instructions 1 to 7.

It is not recommended to operate the beacon inside a life raft or under a cover or canopy. Do NOT tie the lanyard to the ship in distress, as this will prevent the unit to functioning if the ship sinks.

1. Remove the cotter pin from the bracket (FB-60)
2. Remove the FB-60 cover
3. Take out the EPIRB from the bracket
4. Pull the locking pin holding the main switch.
5. Move main switch to the left, to ON position. The LED indicator, located at the top of the antenna, will start to flash, indicating that the EPIRB is operating.
6. Tie the beacon lanyard to you or to the survival craft
7. If possible keep the EPIRB in an open area, away from any metal objects (ship construction etc.) that may limit the satellite coverage. This is especially important for Tron 60GPS, since it needs good reception to obtain a GPS position.

NOTE: To stop transmission, move the main switch to READY position.

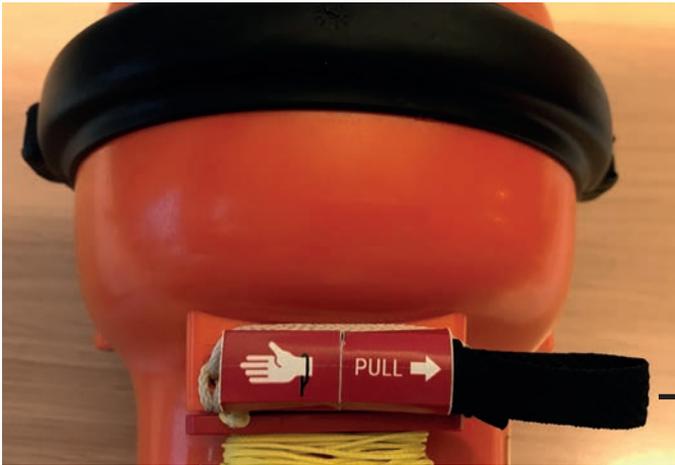
5.2 AUTOMATIC OPERATION - FLOAT FREE BRACKET FB-60



1. The Tron 60S/GPS will automatically release from the bracket, float to the surface and start to transmit when the EPIRB, in its bracket is deployed into water at a depth of app. 2-4 meters (6 - 13 feet).
2. Transmission will continue until the EPIRB is lifted out of the water, and dried off. The transmission can also be stopped by placing the EPIRB in the bracket.

5.3 WRIST STRAP (IF PROVIDED)

In a distress situation the EPIRB can be carried by using the provided wrist strap, where it is necessary to have both arms free, e.g. when climbing a ladder. The wrist strap can be pulled out of the pocket and your arm can be placed through it. It is not possible to put the wrist strap back into the pocket after usage.



Pull the black wrist strap.

Only to be done in a distress a situation.



Open the wrist strap loop and place your arm through it.

5.4 TEST

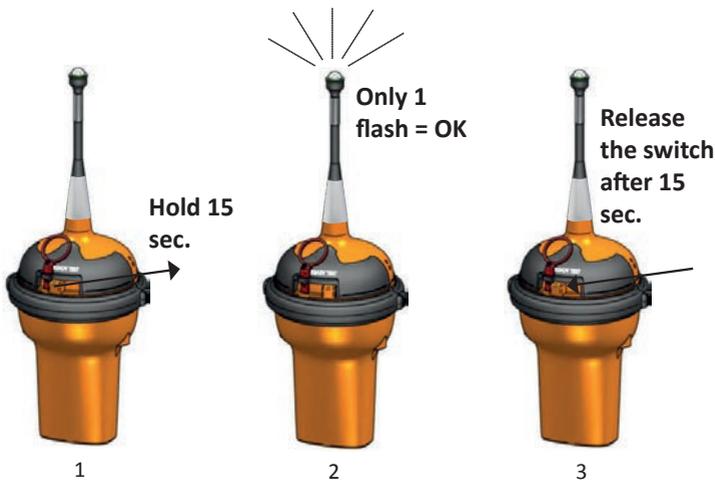
To perform the self-test, the EPIRB has to be removed from the bracket.

FB-60 bracket: Release FB-60 top cover by removing the cotter pin.

WARNING

THE EPIRB CAN DROP OUT OF THE FB-60 BRACKET WHEN RELEASING TOP COVER

1. Push and hold switch in TEST position for 15 seconds. Keep hands and other objects away from the antenna.
2. Test passed after one single flash only!
3. Release the switch and put the EPIRB back into the bracket



Note: Tests should be limited to the first five minutes of the hour, as the satellite EPIRB emits a 121,5 MHz signal during test.



5.5 GPS TEST

NOTE: Limit this test to max. once/month as this test will reduce lifetime of EPIRB battery! The Tron60 GPS has maximum 60 GPS TESTs that can be performed during battery lifetime.

1. Move Switch to TEST twice within 3 seconds and release
2. EPIRB will BEEP shortly every 3 seconds until GPS position acquired
3. OK = 2 BEEPS (see below description if Not OK)
4. Normal SELFTEST is performed after successful GPS TEST and position transmitted on 406.037 MHz. GPS position may be received on an EPIRB Tester for verification

There are two possible error conditions during this test:

- a) 5 BEEPS = Did not acquire GPS position
- b) 10 -" - = Number of GPS TEST above limit (>60)

5.5 EPIRB ERROR MESSAGES

If the self test detects a fault in the EPIRB module, one or more of the following indications are shown:

Number of flashes:	Fault indication:
1	NONE
2	Low power on 406 MHz transmitter
3	Low battery voltage
4	Low power on 121.5 MHz transmitter
5	PLL on 406 MHz transmitter out of lock
6	PLL on 121.5 MHz transmitter out of lock
7	EPIRB module not programmed or programming not complete

Note: Tests should be limited to the first five minutes of the hour, as the satellite EPIRB emits a 121,5 MHz signal during self-test.

6 PERIODICAL CONTROL

6.1 EVERY MONTH:

- Test (see ch.5.3)
What the self-test actually does is to send out a short test signal on 121,5 and 406,037MHz, testing the output of the transmitter. While transmitting the test signal, the battery voltage, output power and phase lock is tested. During the test of the 406MHz transmitter a test message is transmitted, this test message is coded with a special synchronization code and will not be recognized as real alert by the Cospas-Sarsat satellites.
- Visual Inspection
 - The Tron 60S/GPS should be easily removed and replaced in the Bracket
 - Check for defects on the EPIRB or brackets
 - Make sure that the Tron 60S/GPS and Bracket are not painted or otherwise covered with chemicals, oil, etc
 - Is the lanyard firmly attached to the Tron60S/GPS ? (and not tied to the vessel)
- Check the expiry dates on:
 - EPIRB Battery
 - Hydrostatic Release Unit (HRU)

6.2 EVERY 12TH MONTH:

- Annual Test and Inspection
Perform extended annual test according to IMO's MSC/Circ.1040 of 406 MHz satellite EPIRBs as required by SOLAS IV/15.9 (If required by SOLAS or national regulation)
- GPS Test (see ch. 5.3, last part)

6.3 EVERY 2NDYEAR:

- Replace Hydrostatic Release Unit (HRU) including Plastic Bolt (FB-60 only)
(Check expiry date on label)

6.4 EVERY 5TH YEAR:

- Battery change
- SBM (see 7.1)



6.5 SERVICE PROCEDURE

WARRANTY CLAIM

Warranty claims are valid until 5 years from delivery from our warehouse. The warranty is valid as long as service and battery replacement are carried out by authorized Jotron distributors or agents.

All products are warranted against workmanship and factory defect, in material. Any warranty claims must be sent to Jotron, in writing.

Jotron reserve the right to decide whether a defective unit is within warranty terms and conditions.

If Jotron make a decision of repairing a defective product, a written description of the claim and a Jotron RMA number, should follow the unit when returning it back to Jotron's factory.

Please be noted that un-protective electronics board **MUST** be packed in antistatic bag, before returning to Jotron's factory.

Any costs related to transportation and/or workmanship linked up to the return of the product being repaired shall be covered by the customer.

Jotron's obligations during warranty replacement;

- Replace defective unit, including any programming
- Delivery terms: DAP Incoterms 2010 by regular freight to "Place" (Airport)

Service agent's obligations during warranty claims:

- Supply replacement unit from own stock if available
- If agreed, return defective unit to Jotron
- Electronic units must be shipped in antistatic bags or covered with Jotron's plastic cover.

SERVICE – NOT WARRANTY CLAIM

Service, such as testing, installation, programming, replacement, marking and battery exchange are provided by an authorized Jotron service agent. Jotron do not meet the cost for services mentioned above. Distributor or service agent should stock the most commonly needed spare parts.

7 MAINTENANCE

7.1 EPIRB MODULE / BATTERY PACK

If the EPIRB is fitted on a vessel which requires GMDSS compliant equipment, the EPIRB shall be serviced, tested and approved as required by SOLAS regulation IV/15.9.2 of SOLAS 1974 as amended with, in accordance with MSC/Circ.1039 guidelines for shore-based maintenance of Satellite EPIRBs within 5 years, or by the date of battery expiry, whichever comes first.

7.1.1 CHANGE OF BATTERY

The Tron 60S/GPS battery must be changed at Jotron SBM authorized workshop to be GMDSS compliant.

If your Tron 60S/GPS is not under any international or national regulations, battery can be change by authorized Jotron representatives/partners/dealers.

7.2 HYDROSTATIC RELEASE REPLACEMENT

WARNING

Only Jotron approved hydrostatic release is acceptable for use

7.2.1 REPLACING THE RELEASE MECHANISM IN FB-60 BRACKET

1. Release and remove FB-60 top cover by removing the cotter pin (1). **WARNING!** The EPIRB can drop out of the FB-60 bracket when releasing the top cover. Remove the EPIRB from the bracket.
2. Press down the spring-loaded bracket plate and remove the hydrostatic unit by sliding it out of its locking slot. See arrow for direction.(2).
3. Check the expiry date of the new hydrostatic release mechanism (3). The date should be approximately two years from the date of purchase.
4. Install a new hydrostatic unit by pressing down the spring loaded bracket plate and sliding the unit into its locking slot (4).
5. Refit the EPIRB and the FB-60 top cover. Be sure that the top cover is locked at the bottom end and that the top end are fixed at hydrostatic release mechanism rod. Replace the cotter pin (1).



1



2



3



4





8 SPARE PARTS

- 86225 Battery Pack, Tron 60S/Tron 60GPS
- 86218 Hydrostatic Release Unit (HRU) w/Bolt FB-60
- 85621 FB-60, Float Free bracket
- 86559 MB-60, Manual Bracket

NOTE: Keep the original satellite EPIRB packaging, since it may be needed if the EPIRB has to be shipped for servicing. UN requirements for shipping some batteries as hazardous goods require certain packaging standards and labelling.

9 SERVICE AGENTS

Please look at www.jotron.com for Marine Service Agents.

Jotron Group subsidiary companies:

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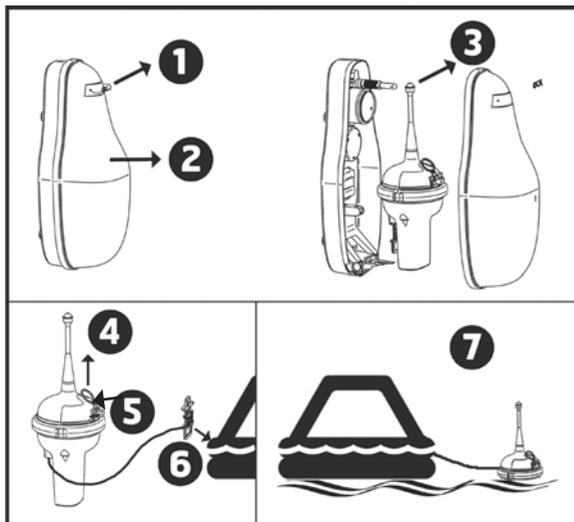
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MANUAL OPERATION AND ACTIVATION



WARNING

The EPIRB can drop out of the FB-60 bracket when releasing top cover

For operation of the beacon in the bracket please follow instructions 1 to 7.

It is not recommended to operate the beacon inside a life raft or under a cover or canopy. Do NOT tie the lanyard to the ship in distress, as this will prevent the unit to functioning if the ship sinks.

1. Remove the cotter pin from the bracket (FB-60)
2. Remove the FB-60 cover
3. Take out the EPIRB from the bracket
4. Pull the locking pin holding the main switch.
5. Move main switch to the left, to ON position. The LED indicator, located at the top of the antenna, will start to flash, indicating that the EPIRB is operating.
6. Tie the beacon lanyard to you or to the survival craft
7. If possible keep the EPIRB in an open area, away from any metal objects (ship construction etc.) that may limit the satellite coverage. This is especially important for Tron 60GPS, since it needs good reception to obtain a GPS position.

NOTE: To stop transmission, move the main switch to READY position.



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