



# Tron 30S MkII

your safety – our concern

USERS MANUAL



EC Declaration of Conformity, available at [www.jotron.com](http://www.jotron.com)

The equipment complies with the following Directives:  
EMC 89/336/EEC

Harmonized Standards applied in order to verify compliance with the Directive(s):  
EN 50081-2:1992  
EN 50082-2:1992

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



**CAUTION!**

This equipment contains CMOS integrated circuits. Observe handling precautions to avoid static discharges which may damage these devices.

JOTRON electronics a.s reserves the right to make changes without further notice to any products or modules described herein to improve reliability, function or design. JOTRON electronic a.s does not assume any liability arising out of the application or use of the described product.

**WARNING/IMPORTANT**

Jotron Electronics a.s. 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 Electronics a.s. 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 (5.1) is added for information only. Jotron Electronics a.s. does not take any responsibility for improper disassembling/assemblin of the beacon. We strongly recommend all service to be done by authorized Jotron agents. In addition to normal service, Jotron 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.





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## GLOSSARY

### C O S P A S

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

### S A R S A T

Search and Rescue Satellite-Aided Tracking System

<b>EPIRB</b>	Emergency Position Indicating Radio Beacon
<b>LUT</b>	Local User Terminal (Ground Station)
<b>MCC</b>	Mission Control Center
<b>RCC</b>	Rescue Coordination Center
<b>km</b>	kilometer
<b>MHz</b>	Mega-Hertz ( $10^6$ Hertz)
<b>GPS</b>	Global Position System



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# BATTERY SAFETY DATA SHEET

(Form: EEC directive 91/155)

## (2) SAFETY ADVICE

- S2 Keep out of reach from children.
- S8 Keep container dry.
- S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- S43 In case of fire, use D type extinguishers. Never use water.
- S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

## (3) FIRST AID MEASURES

In case of contact of cell contents with eyes, flush immediately with water for 15 min. With skin, wash with plenty of water and take off contaminated clothes. If inhalation, remove from exposure, give oxygen, seek medical advice.

## (4) FIRE-FIGHTING MEASURES

### Extinguishing media

- Suitable: Type D fire extinguishers
- Not to be used: Water - CO<sup>2</sup> - Halon, dry chemical or foam extinguishers

### Special exposure hazards

Generation of chlorine, sulfur dioxide, disulfur dichloride during thermal decomposition.

### Special protective equipment

Use protective working boots, rubber apron and safety glasses with side shields.



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## INSTRUCTIONS FOR KEEPING THE RADIO LOG AND THE RADIO OPERATORS OBLIGATION ACCORDING TO NATIONAL AND INTERNATIONAL REGULATION.

1. The radio log shall be kept in accordance with requirements in the Radio Regulations, SOLAS Convention, national regulations regarding radio installations and the STCW Convention (STCW 95 including the STCW Code) including relevant regulation regarding watchkeeping on board passenger- and cargo ships.
2. Unauthorized transmissions and incidents of harmful interference should, if possible, be identified, recorded in the radio log and brought to the attention of the Administration in compliance with the Radio Regulations, together with an appropriate extract from the radio log. (STCW Code B-VIII/2 No.32)

## TEST OF RADIO EQUIPMENT AND RESERVE SOURCE OF ENERGY

### **Weekly:**

GMDSS handheld VHF transceivers to be tested without using the mandatory required emergency batteries.

### **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. Search and rescue radar transponders (SART) to be checked against 9 GHz radar.

Float-free EPIRBs are required to go through a periodical maintenance every 24 months. (Only for NOR/NIS flag vessels).

### **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.

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# 1. SYSTEM DESCRIPTION

## COSPAS/SARSAT satellite system

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 13000 people have been rescued by the COSPAS/SARSAT system. Currently the system consists of 8 low earth orbit satellites (LEOSAR). These satellites cover the entire earth's surface and receive the emergency signal from the 406 MHz transmitter within the Tron30S. In addition there is currently 3 geostationary satellites which are equipped with a 406 MHz transponder, these satellites are not able to locate the Tron30S but will give an early warning to the rescue forces, minimizing the time from an emergency occurs till the rescue forces are at the site.

Each emergency beacon in the system is programmed with its own unique code, therefore it is vital that the ship's data given to the dealer you obtained your Tron30S from, is correct. It is also important that your beacon is registered in the database for each country. This database is normally located in the same country that the ship is registered.

### 1.1 SIGNAL DETECTION [FIG.1]

When the Tron30S is activated (manually or automatically) it transmits on the frequencies 121.5 MHz and 406.025 MHz. An analog signal is emitted on 121.5 MHz and a digital signal is transmitted on 406.025 MHz.

After the Tron30S is activated, the next LEOSAR satellite will detect the transmitted signal and relay it to an antenna at a ground station, called a LUT. For the 121.5 MHz signal the satellite must be within line of sight of the Tron30S and a ground station. The ground station or LUT has a 2500 km satellite reception radius centered at the LUT. In areas without LUT coverage (mostly southern

hemisphere), signals from the 121.5 MHz transmitter will not be detected. However, this is not the case with the 406 MHz transmitter as the satellites have a memory unit which stores the signals for relay to the next available LUT giving it a truly global coverage. The geostationary satellites cover the earth from 70 degrees north till 70 degrees



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south. They receive the signal on 406 MHz and transmit it without delay to a LUT, but positioning is only possible when the EÅIRB has an integrated GPS or is connected to external GPS:

Once the signal is received by the LUT, it is processed for location and sent to a Mission Control Center (MCC). The MCC sorts the alert data according to geographic search and rescue regions and distributes the information to the appropriate Rescue Coordination Center (RCC), or if outside the national search and rescue area, to the appropriate MCC that covers the area that the distress signal was detected. The RCC in turn takes the necessary action to initiate search and rescue activities.

## **1.2 DISTRESS LOCATION DETERMINATION**

The location of the distress signal is determined by taking measurements of the Doppler shift in the beacon signal frequency received by the satellite as it approaches and then passes by the Tron30S. 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 Tron30S 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). With the 406 system the real solution can be determined on the first pass with a reliability of nearly 90% and down to an accuracy of less than 5 km (3.1 miles). An accurate 406 MHz frequency is essential to have a quick and precise position.

FIGURE SARSAT COSPAS satellitter MCC/RCC/LUT osv.

## **1.3 BEACON REGISTRATION**

Normally the MCC will try to contact the vessel or the contact person registered in the register (Ships owner, family member etc.) before alerting the RCC. This is to determine if the alarm from the beacon for some reason is a false alarm. Therefore it is important that the ships data always is correct in the shipping register or in the beacon database.



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Tron30S purchased in some countries will have a registration form attached to it, it is important that this registration form is completed by the owner and returned to the place the beacon was purchased or to the address specified on the registration form. Other countries use the already available shipping register to obtain the necessary information for a vessel in distress, in these countries the ship is already registered and no registration form is necessary, **however it is vital that the coding of the Tron30S is kept up to date with datas on the ship (nationality, callsign, etc), to minimize the time from an alarm to the start of the search and rescue operation.**

Reprogramming the Tron30S can be done at authorized JOTRON agents in more than 40 different places throughout the world.

## 2. OPERATING THE Tron30S

The Tron30S is designed to be operated either manually or automatically. It is always armed, that is the beacon will automatically start to transmit when the beacon in its bracket is deployed into water. It is stored in its bracket in an inverted position, this is to prevent false activation caused by ice or seawater covering the beacon.

### 2.1 MANUAL OPERATION (ALL BRACKETS) [FIG.2]

- Pull out the locking pin on top of the bracket.
- Lift the upper arm of the bracket and remove the Tron30S.
- Keep the beacon in an upright position (switch on top of the beacon).
- Break the seal on the switch at the top of the Tron30S and pull the locking pin - located at the rear of the switch.
- The switch is spring loaded and will automatically go to the EMERGENCY position.
- The LED indicator, located at the equator ring, will start flashing indicating that the beacon is operating. In addition there is an internal light in the beacon that will start to light.
- The beacon may be put back into its bracket, operating in the upright position. However, this is not a recommended operation as the satellite coverage might be limited due to metal objects close to the Tron30S (bracket, ship constructions etc.).
- If possible keep the beacon in an open area, away from any metal parts that may limit the satellite coverage.
- Transmission may be stopped by turning the switch to OFF position and remounting the locking pin at the switch. Transmission can also be stopped by turning the beacon upside down.



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## 2.2 AUTOMATIC OPERATION (FB3, FBH3 BRACKETS ONLY!) [FIG.3]

- The Tron30S will automatically release from the bracket, float to the surface and start to transmit, when the beacon in its bracket is deployed into water at a depth of app. 2-4 meters (6 -13 feet).
- Alternatively the beacon can be manually released from the bracket and put into the water.
- Transmission will continue until the beacon is lifted out of the water.

## 3. MAINTENANCE AND SERVICE

Maintenance of JOTRON EPIRBs

### Every Month:

Perform EPIRB self-test. (See chapter 3.1.).

What the self test actually does is to send out a short test signal on 121,5 and 406,025 Mhz, 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 synchronisation code and will not be recognized as real alert by the COSPAS/SARSAT satellites.

Carry out visual inspection for defects on both the EPIRB and Bracket.

The EPIRB should be easily removed and replaced in the Bracket. Make sure that the EPIRB and Bracket is not painted or otherwise covered with chemicals, oil, etc.

Check the expiry date of the EPIRB Battery and the Hydrostatic Release Mechanism.

Check the presence of a firmly attached lanyard in good condition and that it is neatly stowed and is not tied to the vessel or the mounting bracket.

### Every 12th Month:

Perform extended annual test according to IMO's MSC/Circ.1040 (Annual testing of 406 MHz satellite EPIRBs) as required by SOLAS IV/15.9. This test can be carried out by one of Jotron's authorised representatives or any other service provider in possession of a Tron UNIDEC, Tron DEC or any other Cospas-Sarsat EPIRB tester/decoder.

The test ensures that the EPIRB is within its specifications and complies with IMO and the COSPAS/SARSAT system. Documented proof of test or Test Certificate containing test results and EPIRB data issued by service provider must be kept on board for future inspections the next 12 months.



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### **Every 2nd Year:**

Hydrostatic Release Mechanism including Plastic Bolt on the Float Free Brackets must be replaced. (Check expiry date on label).

### **Every 4th Year:**

The EPIRB Battery must be replaced every 4th year, unless otherwise instructed by the vessel flag state or local authorities.(Check expiry date on label).

NOR/NIS flag vessels are required to go through periodical maintenance every 24 months by replacing the complete EPIRB.

### **Tron 30S self test:**

- Pull out the locking pin on top of the bracket.
- Lift the upper arm of the bracket and remove the Tron 30S.
- Keep the beacon in an upright position (switch on top of the beacon).
- Press the springloaded switch on the top of the beacon to the TEST position.
- A successful test will consist of a series of blinks on the LED testindicator and internal strobe light, followed by a continuous light after app. 15 seconds. (Earlier versions of the Tron 30S might have a slightly different testpattern, however they will all end up with a continuous light indicating a successful test).
  - Release the switch and put the beacon back into the bracket in inverted position (normal storage position).
- Replace locking pin on top of the bracket.

Note: The beacon can not transmit in inverted position (normal storage position in the bracket). This feature is built in to prevent false alarms.

## **3.1 TRON30S SELF TEST [FIG.4]**

- Pull out the locking pin on top of the bracket.
- Lift the upper arm of the bracket and remove the Tron30S.
- Keep the beacon in an upright position (switch on top of the beacon).
- Press the springloaded switch on top of the beacon to the TEST position.
- A successful test will consist of a series of blinks on the LED testindicator and internal strobe light, followed by a continuous light after app. 15 seconds. (Earlier versions of the Tron30S might have a slightly different test pattern, however they will all end up with a continuous light indicating a successful test).
  - Release the switch and put the beacon back into the bracket in the inverted position (normal storage position).
- Replace locking pin on top of the bracket.

What the self test actually does is to send out a short signal on 121.5 Mhz, testing the output of the transmitter. While transmitting the signal, the battery voltage is checked. The 15 seconds pause that follows is to allow the 406 Mhz transmitter to warm up. Finally a 406 Mhz signal is transmitted and the output power is checked, the battery voltage is also tested during this transmission to ensure that the battery is in good shape while drawing maximum current from it. While testing the 406 Mhz transmitter the normal message sent to the satellite is also



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transmitted, however this signal is transmitted with a special synchronization code and will not be detected by the satellites. The purpose of this signal is to check the actual coding of the beacon, which can be done using the JOTRON test unit Tron DEC or Tron UNIDEC

### **3.2 REPLACING THE BATTERY UNIT [ F I G . 5 ]**

Replacing the battery unit should be done by skilled technicians only - preferable by a JOTRON agent. Your closest JOTRON agent with TronSTAT facilities has been specially trained to perform the necessary operation and is also able to do an extended test of the beacon, ensuring that the Tron30S operates within the specifications.

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- Pull out the locking pin on top of the bracket.
- Lift the upper arm of the bracket and remove the Tron30S.
- Break the seal on the split pin, in the U-shaped bolt on the equator ring.
- Remove equator ring by pressing it out from the housing.
- Separate the two halves of the Tron30S housing.
- Unplug the 6 pin connector for battery supply and seawater contacts.
- Check that the new battery unit is marked with X-94469 and has a new expiration date approximately 4 years from purchase.
- Fit a new gasket on top of the battery unit.
- Reconnect the 6-pin connector from the battery unit to the 6pin plug on the electronic unit. Be sure that the connector is fitted properly, a click should be heard when the connector is in place.
- Orientate the two halves of the beacon in the following way: Small spigots in each of the halves should be pointing against each other. Test Light indicator should be orientated above one of the arrows of the battery unit.
- Replace equator ring, using a special tool to tighten it together.
- Replace U-shaped bolt and a new split pin that secures the Ushaped bolt in the equator belt.
- Perform self test on beacon to ensure that the new battery is fitted correctly.
- Put beacon back into the bracket in the inverted position.
- Replace locking pin on top of the bracket.

### **3.3 SERVICE**

#### **Warranty Service.**

The warranty of the equipment is not valid if the customer has tried to repair, modify or rebuild the unit, deliberate or accidental damage, failure to follow JOTRON's instructions with respect to approved service agents or if the unit has been exposed to environmental conditions outside the specifications for the unit.



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As a standard Jotron Electronics AS warrants that this product will be free from defects in materials and workmanship for a period of 12 months from the date received by end user, limited to 18 months from purchase from Jotron.

If necessary to have the unit repaired, please return it carriage pre-paid to the agent where you did your purchase. Provided that the unit(s) returned for repair is found to be under warranty, man-hour cost and material cost will be covered by Jotron. Additional costs not related to repair/replacement of the unit will not be covered.

### **Out of Warranty Service.**

For defects arising from normal wear and tear after 12 months of operation, limited to 18 months from purchase from Jotron, normal service conditions will apply.

**For details see:** [www.jotron.com](http://www.jotron.com).

## **4. BRACKETS**

Three different brackets are available for the Tron30S. MB-3 is a manual bracket, and in addition there are 2 different float-free brackets: FB3 and FBH3. Mechanically the three brackets are equal, however, the float-free brackets are equipped with a hydrostatic release mechanism. FBH3 is in addition equipped with a heating element. FB-1 and FB-2 bracket are in use for Tron 30S. Please contact Jotron for maintenance of these products.

### **4.1 FLOAT FREE BRACKETS FB3, FBH3**

When the Tron30S is mounted in one of the float-free brackets, FB3, FBH3, it operates as a float free automatic unit. Therefore it is important that the bracket is mounted in a place where there are no obstructions that can endanger the automatic release of the beacon. The location where the bracket is mounted should be as high as possible on the vessel, protected from

environmental conditions such as direct sea-spray, chemicals, oil, exhaust and vibrations.

The location must also be easily accessible for testing and maintenance. For the FBH3, one must also take into consideration the availability of a voltage of 24V AC/DC for the heating element.

### **4.2 MANUAL BRACKET MB3**

When the Tron30S is mounted in the MB3 bracket it will operate only as a manual unit.

This bracket is similar to the FB3 bracket but does not have the hydrostatic release mechanism. This bracket is typically used for storing the beacon inside the wheelhouse or other protected areas of the ship. When the Tron30S is mounted in the MB3 bracket it must be manually removed before any operation can take place, therefore the bracket should be mounted in an easily accessible place where it can be reached in a hurry in case of an emergency.

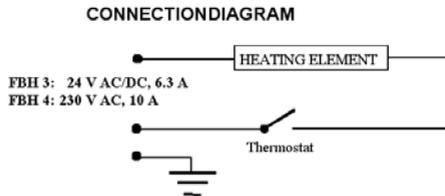


### 4.3 MOUNTING THE BRACKET [FIG. 6]

- Bolt the bracket to the vessel using the 8 or 10 mm bolts in the 4 mounting holes.
- The bracket is to be mounted in an upright position with the hydrostatic release mechanism towards the bottom of the bracket (FB3, FBH3). Note the arrow indicating UP on the bracket.
- Connection of the heating element is done using the included schematic diagram (FBH3 only).

#### **CONNECTION INSTRUCTIONS**

The **FloatFree Bracket FBH3** and **FBH4** must be connected to the fixed installation through the thermostat connection box according to the connection diagram below.



### 4.4 REPLACEMENT AND MOUNTING OF THE HYDRO-STATIC RELEASE MECHANISM [FIG. 7]

- Pull out the locking pin on top of the bracket.
- Lift the upper arm of the bracket and remove the Tron30S.
- Unscrew the plastic bolt (1) and remove the hydrostatic unit (2).
- Check expiration date of the new hydrostatic unit (2), this should be approximately 2 years from the date of purchase.
- Mount the new hydrostatic unit (2). The unit is fixed to the bracket with a washer (3), rubber seal (4), washer (5), O-ring (6), and a plastic bolt (1).
- Secure the plastic bolt using hand-force only!

**DO NOT USE ANY TOOLS, AS THIS WILL WEAKEN THE BOLT!**

**USE ONLY ORIGINAL HAMMAR PLASTIC BOLT,  
JOTRON PART NO X-92243.**

**USE OF OTHER TYPE OF BOLTS CAN CAUSE  
SEVERE MALFUNCTION OF THE RELEASE  
MECHANISM AND MIGHT PREVENT THE BEACON  
FROM RELEASING FROM THE BRACKET.**

- Remount the Tron30S, be careful with the plastic bolt ( 1 ), when mounting the beacon.

# FIGURES

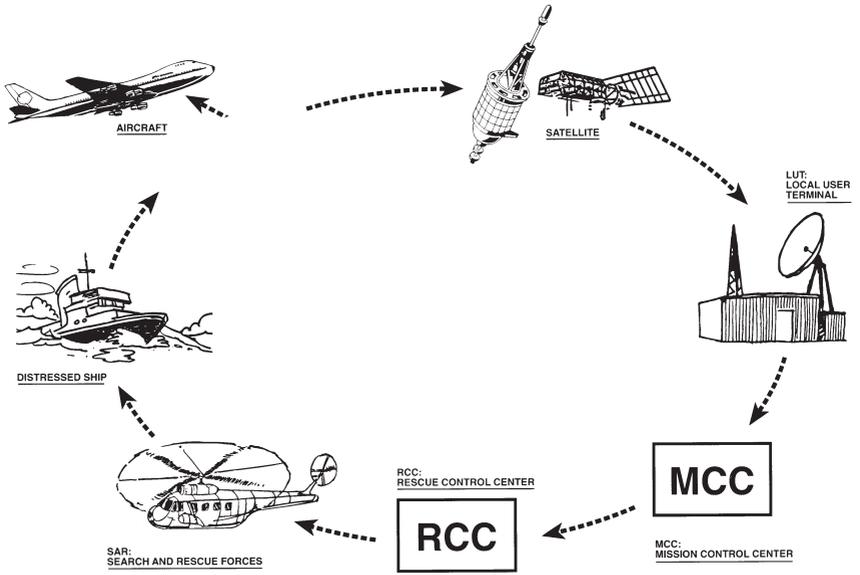
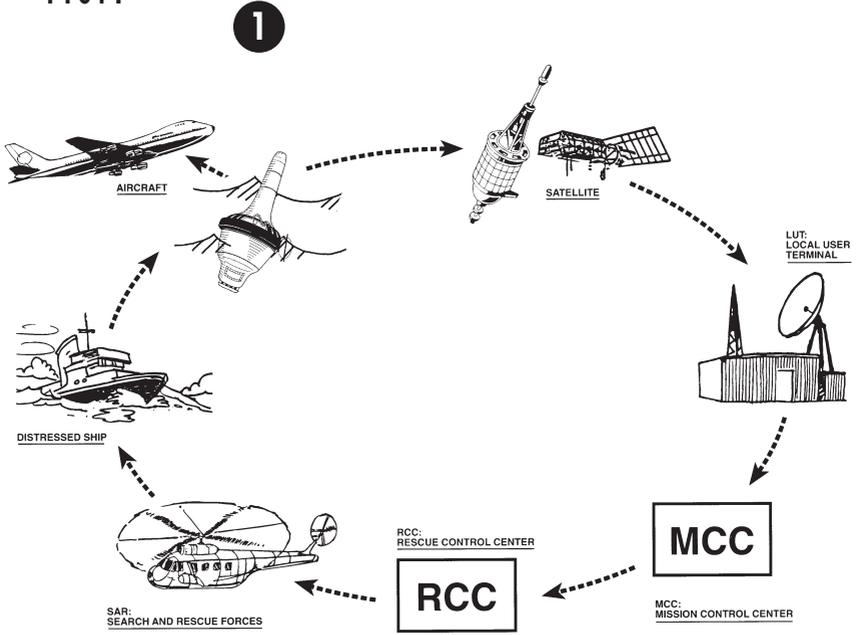


FIG. 1



2

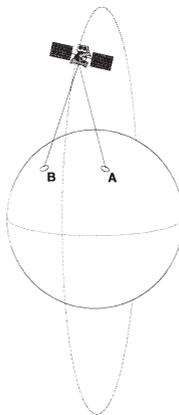
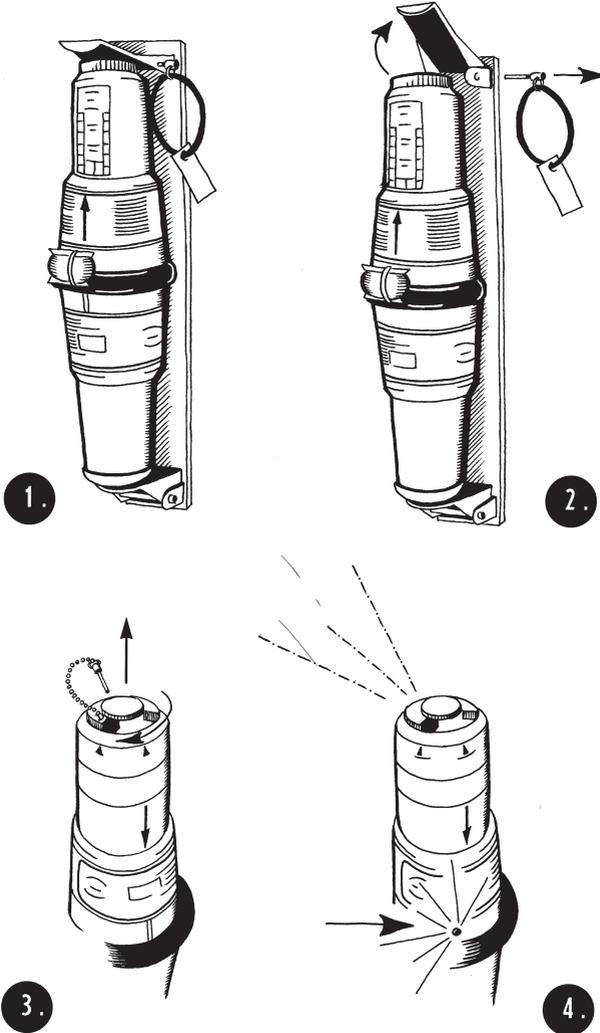




FIG 2  
MANUAL OPERATION [2.1]



**FIG. 3**  
**AUTOMATIC OPERATION [2.2]**



**FIG. 4**  
**SELF TEST [3.1]**

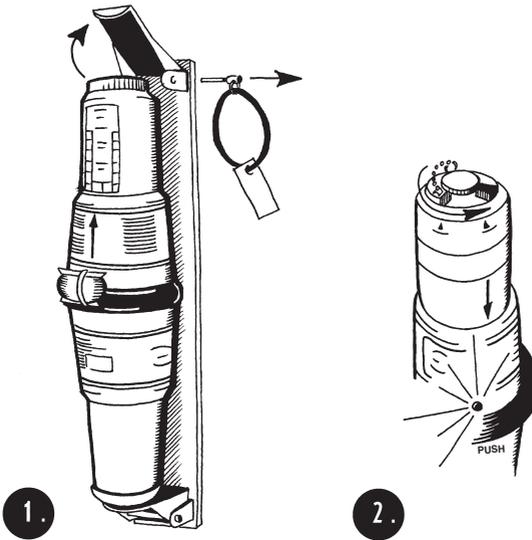
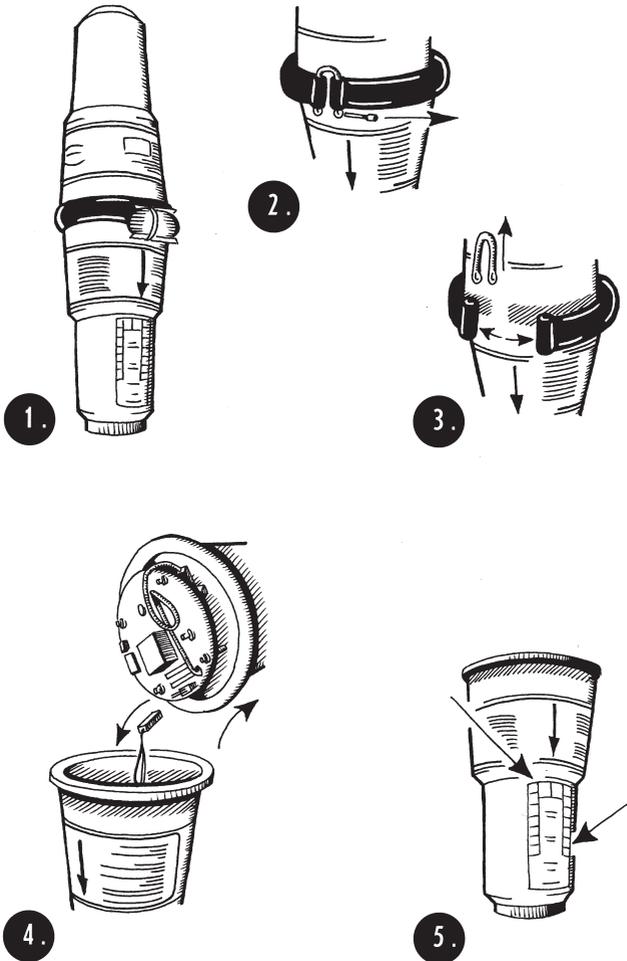




FIG 5.  
REPLACING THE BATTERY UNIT [3.2]



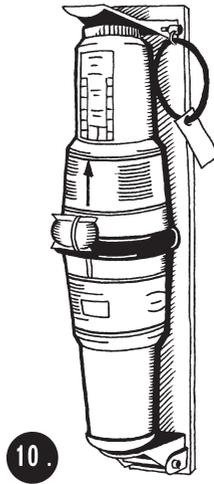
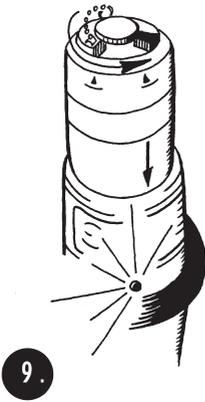
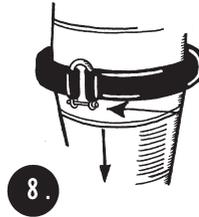
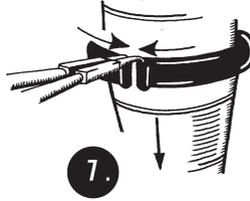
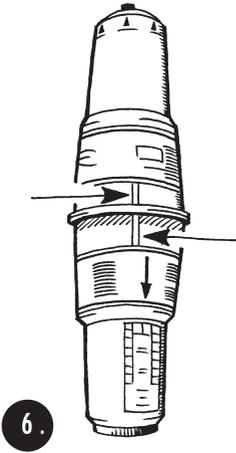


FIG 6.  
MOUNTING  
THE BRACKET [4.3]

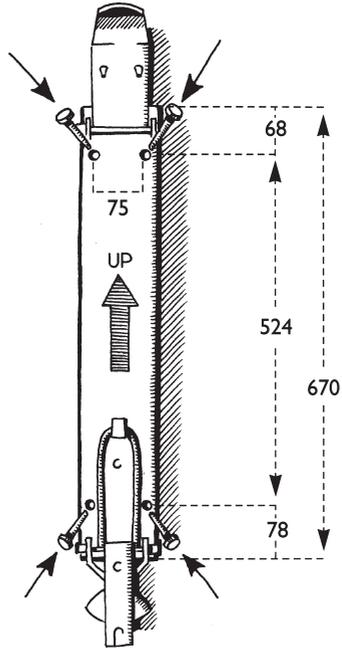
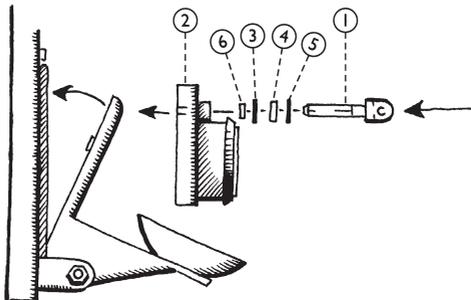


FIG 7.  
MOUNTING THE HYDROSTATIC RELEASE  
MECHANISM [4.4]





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## NOTES:

A series of horizontal dotted lines for taking notes.



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A series of horizontal dotted lines for taking notes.



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