PRODUCT SUPPORT MANUAL

Y1-03-0157
Rev. T1

GlobalFix™ 406

Emergency Position
Indicating Radio Beacon
FCC Type Accepted

Product No. 2742 Cat. I
Product No. 2744 Cat. II

Owner _____

Vessel _____

Radio CallSign _____

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*** * * WARNING * * ***
THIS TRANSMITTER IS AUTHORIZED FOR USE ONLY DURING SITUATIONS OF GRAVE AND IMMINENT DANGER

DELIBERATE MISUSE MAY INCUR A SEVERE PENALTY

Advice to owners of Emergency Position Indicating Radio Beacons (EPIRBs)

Registration of 406 MHz satellite EPIRB with the EPIRB Registration Section of the *national authority** is mandatory because of the global alerting nature of the system.

The information provided in the Registration Card is used only for rescue purposes.

Fill in the owner registration card immediately upon completion of the sales transaction. Mail the Registration Card immediately.

If the beacon is to enter service immediately, complete the Registration Card and fax the information to the national authority. The original card must still be mailed to the *national authority** for hard-copy reference and filing.

If the current owner is transferring the beacon to a new owner, the current owner is required to inform the *national authority** by letter, facsimile or telephone, of the name and address of the new owner.

The subsequent owner of the beacon is required to provide the *national authority** with the information as shown on the owner Registration Card.

This obligation transfers to all subsequent owners.

*National Authority

The term “national authority” appears throughout this manual. Wherever these words appear, reference is made to the government body responsible for EPIRB registration for the country in which the vessel is registered. The addresses for various national authorities can be found on the Registration Card appropriate for your vessel.

The national authority in the U.S.A. is NOAA. The NOAA registration telephone no. is 1-888-212-7283 (toll free).

Note: In the U.S.A. please use the enclosed FCC FORM 506 to modify your radio station license if necessary. For information on whether you need a radiostation license, call 1-888-CALLFCC (toll free)

SECTION 1 - THE SYSTEM

1.1 GENERAL

1.1.1 This manual provides installation, operation and maintenance instructions for the **GlobalFix™ 406** Emergency Position Indicating Radio Beacon, hereinafter referred to as the Beacon. This section describes the characteristics and details of the Beacon System. The FCC authorizes the use of 406 MHz Radio Beacons by any ship that is also equipped with a VHF Ship Station. This will make the 406 MHz Radio Beacon available for use on most U.S. ships and boats. EPIRB carriage requirements are contained in USCG regulations.

1.2 PURPOSE

1.2.1 The **GlobalFix™ 406** Beacon provides distress alerting via radio transmission on 406 MHz to satellites of the COSPAS-SARSAT network and to the GEOSAR network that includes GPS latitude and longitude coordinates.

1.2.2 The message transmitted by the **GlobalFix™ 406** is unique for each EPIRB, which provides identification of the transmitter through computer access of registration files maintained by the National Oceanic and Atmospheric Administration or other national authority. **It is the user's responsibility to fill out and mail the enclosed registration form to the appropriate agency of the country under which the vessel is registered.** US flagged vessels send the enclosed NOAA/NESDIS form to NOAA in the stamped envelope provided. For vessels registered in other countries, the **GlobalFix™ 406** must be reprogrammed by an ACR authorized programming facility for the registered country. **Remember**, if your EPIRB is **not registered**, SAR Authorities do not know who you are, what type of vessel, your homeport, or where to contact anyone who might know anything about your situation.

1.2.3 Once the **GlobalFix™ 406** signal (406 MHz) is relayed through the COSPAS-SARSAT and/or GEOSAR network alert, Search and Rescue (SAR) forces, they can converge on the GPS navigation position. When the **GlobalFix™ 406** is used, SAR authorities can know your precise location immediately and speed up reaction time. The **GlobalFix™ 406** on board radio beacon transmitter (121.5 MHz) and high intensity xenon strobe light aid intermediate and short-range location.

1.2.4 Product number 2742 **GlobalFix™ 406** may be deployed and activated automatically by the built-in hydrostatic float free release.

Once free from the release bracket, the **GlobalFix™ 406** will automatically turn on if the water sensors are wet.

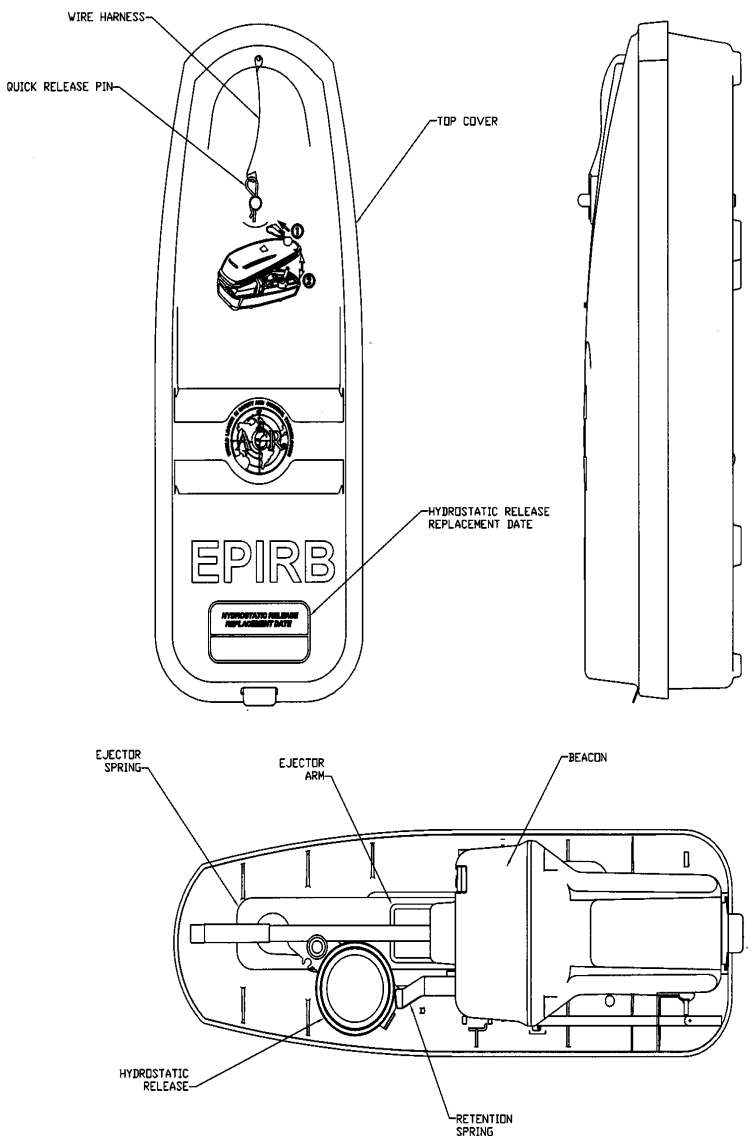
1.2.5 Alternately, the **GlobalFix™ 406** can be manually activated by lifting the thumb switch to a vertical position, sliding it toward the antenna and pushing back down to the opposite side of the EPIRB. Activating the beacon in this manner breaks off the "Activation Indicator Plastic Pin" and allows the switch to properly seat, showing the " ▮ " symbol (ON).

1.2.6 Self contained long life batteries with a five-year recommended replacement cycle provide power. *See Factory Authorized Service Center for replacement (Section 4.0 – Maintenance).*

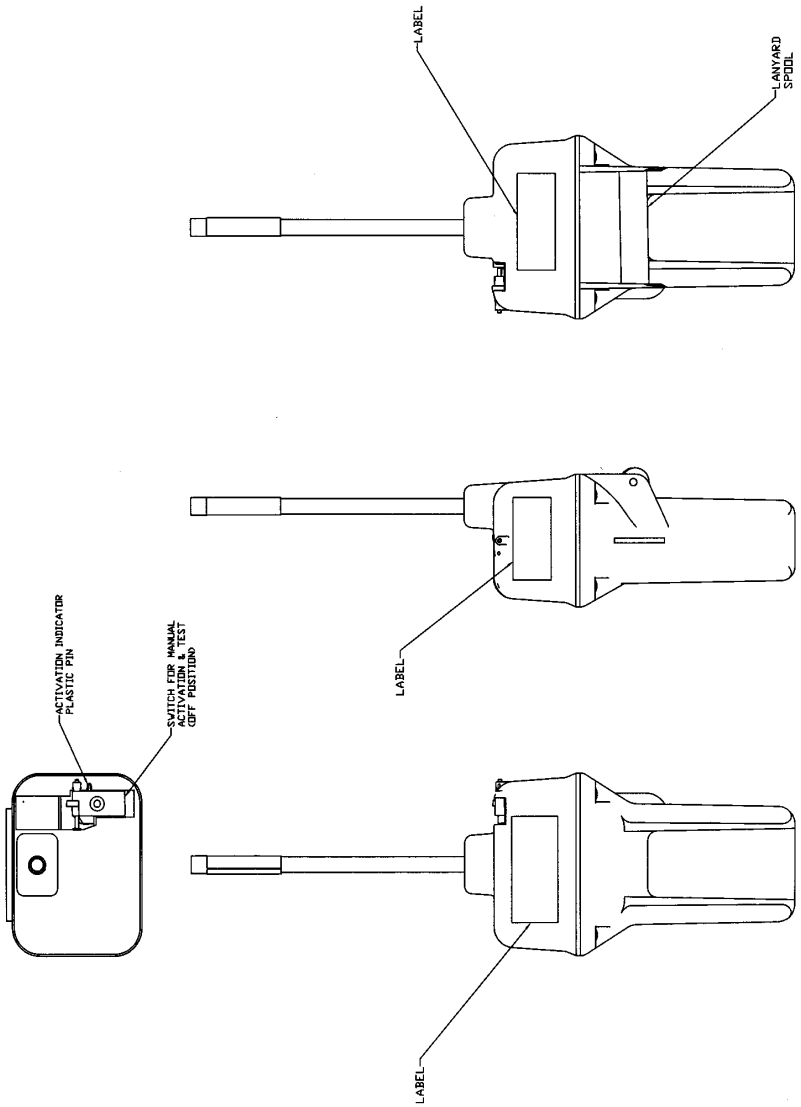
1.2.7 Self-test is initiated by momentarily lifting the thumb switch to a vertical position and holding it in this position for at least two seconds and at most 4 seconds. A beep and the simultaneous lighting of the red LED indicate the initiation of the test. The buzzer will beep an additional four times as the red LED lights simultaneously. The green LED will then light, followed by a flash of the strobe, indicating a successful test. During self-test, an actual satellite message is transmitted while certain key performance parameters are measured and recorded. The self-test message is modified to prevent the satellite from forwarding an alert message during self-test.

<u>Warning</u>: The following test should never be performed more than once during the five-year life of the battery pack!

1.2.8 If the thumb switch is held in the vertical position after the Self-test has finished, the buzzer will beep and the red LED will light simultaneously. This beep and simultaneous red LED indicates that the GPS has been turned ON and a live test of the internal GPS has begun. At this point the thumb switch should be allowed to return to its normal OFF position. The GPS will remain ON until good navigation data has been obtained or until 10 minutes has elapsed. If good navigation data has been obtained, the GPS will be turned OFF and the green LED will light for 2 to 3 seconds. This navigation data is **<u>not</u>** saved for use when the beacon is turned ON. A green LED indication is proof that the GPS is functioning properly and that the beacon is in a location or environment where it can receive the necessary



Universal Sea Shelter
Figure 6



ACR GlobalFix™ 406
Figure 5

signals from satellites. IF the GPS never gets good navigation data, the GPS will turn OFF after 10 minutes and there will be no successful green LED indication. This test should never be performed more than once during the five-year life of the battery pack to prevent excessive current drain!

1.2.9 If the thumb switch is accidentally or inadvertently put in the vertical position (not in the OFF or ON position), the beacon would still be turned ON and would drain the battery. That this should happen accidentally or inadvertently is very unlikely. However, if this should occur, the beacon will sound a beep once per second and will alternately flash the red and green LED's at a rate of one per second until the beacon is turned OFF. It is important that the beacon be turned OFF immediately (lowering the thumb switch to the OFF position, thumb switch at rest in the front position) if this alert is ever obtained.

1.3 SATELLITE DETECTION

1.3.1 The **GlobalFix™ 406** transmits an encoded phase modulated radio signal to the satellite portion of the COSPAS-SARSAT System. The system was developed and implemented by the COSPAS-SARSAT Partners (Russian Federation, Canada, France and the United States).

1.3.2 COSPAS-SARSAT is an international system that uses Russian Federation and United States low altitude, near-polar orbiting satellites that assist in detecting and locating activated 121.5/243 MHz EPIRBs and 406 MHz Satellite EPIRBs. The Russian Federation provides aboard COSMOS navigation spacecraft COSPAS payloads that are inter-operable with the SARSAT System. In addition to weather and environmental sensors, SARSAT payloads, provided by Canada and France, are carried aboard the United States National Oceanic and Atmospheric Administration's (NOAA's) Advanced TIROS environmental satellites. (See Figure 1: Satellite Detection)

1.3.3 COSPAS and SARSAT satellites receive distress signals from satellite EPIRBs transmitting on the frequency of 406.025 or 406.028 MHz. The COSPAS-SARSAT 406 MHz satellite EPIRB signal consists of a transmission of non-modulated carrier followed by a digital message format that provides identification data. The 406 MHz system uses spacecraft-borne

equipment to measure and store the Doppler-shifted frequency along with the satellite EPIRB digital data message and time of measurement. This information is transmitted in real time to an earth station called the Local User Terminal (LUT), which may be within the view of the satellite, as well as being stored for later transmission to other LUTs. In the real-time mode, the signal detection is limited to a mutual EPIRB-satellite-LUT circular visibility area of about 2500 km radius that moves with the satellite along its track. However, because of the stored-mode capability at 406 MHz, the need for this mutual EPIRB-satellite-LUT visibility is not essential, and the system is fully functional worldwide.

1.3.4 The LUT processes the Doppler-shifted signal and determines the location of the satellite EPIRB; then the LUT relays the position of the distress to a Mission Control Center (MCC) where the distress alert and location information is immediately forwarded to an appropriate maritime Rescue Coordination Center (RCC). The RCC dispatches Search and Rescue (SAR) forces.

1.3.5 The COSPAS-SARSAT System includes 36 LEOSAR LUT stations, 6 GEOSAR LUT stations and 19 Mission Control Centers that provide real-time as well as global-mode coverage for the Northern Hemisphere, while the Southern Hemisphere is presently served primarily by the global mode. Additional LUTs and MCCs are planned for installation in the near future both in the northern and southern hemispheres.

The addition of the GEOSAR Satellite system greatly improves the reaction time for a SAR event. This satellite system has no Doppler capabilities at 406 but will relay the distress alert to any of the LUT stations. When there is GPS data included in the distress message, SAR authorities instantly know where you are located. This speeds up the reaction time by not having to wait for one of the LEOSAR satellite's to come around.

GEOSAR SATELLITE COVERAGE
Figure 1

SAR SATELLITE ORBITS

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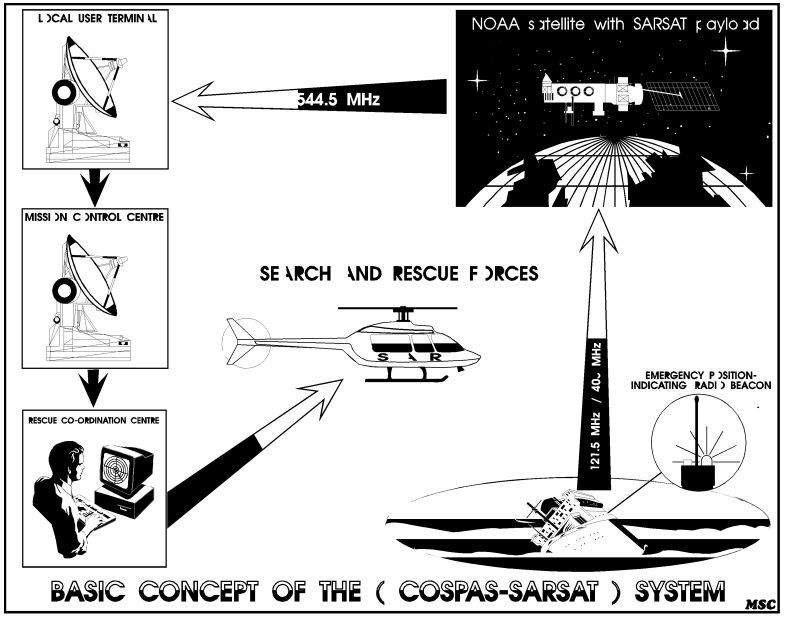


FIGURE 4

number or code which is broadcast on 406 MHz. Registration provides the Search and Rescue people with important information which will speed up the rescue operation and minimize false alarms.

5.2 To register this EPIRB with NOAA (USA registration only), simply fill out and mail the provided form in the enclosed pre-addressed envelope to NOAA or fax the completed form to NOAA at (301) 457-5406.

5.3 NOAA will supply a Beacon Registration decal which is to be affixed to the **GlobalFix™ 406**. The recommended mounting location is on the front of bottom case above the instruction label.

6.0 FALSE ALARMS

6.1 Should there be, for any reason, an inadvertent activation or false alarm, it must be reported to the nearest search and rescue authorities. The information that should be reported includes the satellite EPIRB Unique Identifier Number (UIN); date, time, duration, and cause of activation; and the location at the time of activation.

6.2 Contact the following to report false alarms (US):

Atlantic Ocean/Gulf of Mexico—
USCG Atlantic Area Command Center
Tel: (212) 668-7055

Pacific Ocean Area—
USCG Pacific Area Command Center
Tel: (510) 437-3700

From any location—
USCG HQ Command Center
Tel: (800) 323-7233

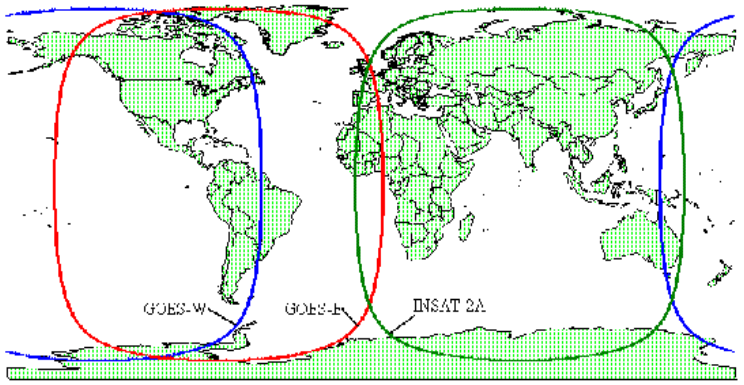
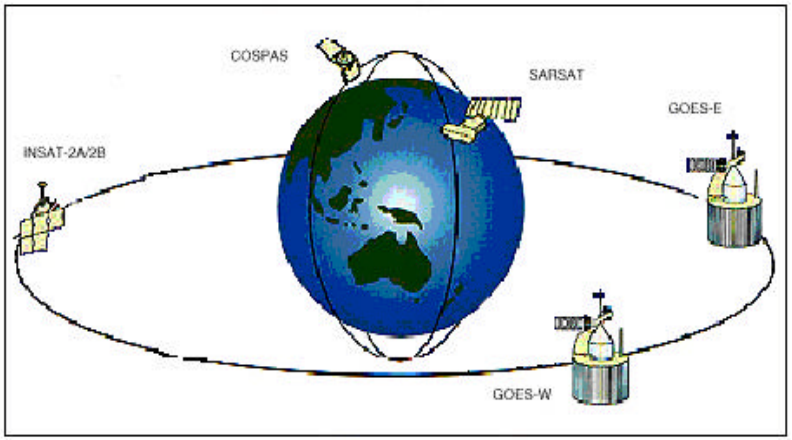


Figure 2



1.3.6 Because most of the search and rescue forces presently are not equipped to home on the 406 MHz Satellite EPIRB signal, homing must be accomplished at 121.5 MHz.

1.3.7 The **GlobalFix™ 406** EPIRB is available in two combinations. The following product codes define the options available to meet specific operational requirements:

Prod. No.	Model No.	Cat. I	Cat. II
2742	RLB-35	X	
2744	RLB-35		X

te: All models above conform to Class 1 Requirements (operations: –40°C to 55° C storage: -50°C to 70°C)

1.4 AUTHORIZATIONS

1.4.1 The **GlobalFix™ 406** EPIRB meets the requirements of Federal Communications Commission (FCC) Part 80 (Product No. 2742, 2744) and GMDSS (Product No. 2742)

1.5 CHARACTERISTICS

1.5.1 The **GlobalFix™ 406** EPIRB is a floatable, battery operated unit. The beacon case, with its external antenna, is waterproof. The semiconductor circuits are mounted within the case assembly that also contains the battery power supply. A “Test/On” switch is installed on top of the beacon, along with a strobe light. The beacon must be stored in its special mount, free of obstructions aboard a vessel for automatic float-off. The unit is self-buoyant and no external floatation devices are required.

1.6 TECHNICAL DATA - GlobalFix™ 406

1.6.1 Applicable Documents

RTCM	Standard for 406 MHz Satellite EPIRBs
COSPAS-SARSAT	Document C/S T.001 Oct. 99
FCC	Part 80 (Model No. RLB-35) and GMDSS (Product No. 2742)

4.3 The hydrostatic release unit (HRU) must be replaced by the date indicated on the float free mounting bracket. The hydrostatic release can be replaced by removing the Beacon from the bracket, then sliding the hydrostatic release assembly out of the keyed opening on the spring and mounting bracket. Insert the new hydrostatic release assembly, in place by engaging it to the opening of the ejection spring and case. When servicing the HRU, ACR strongly recommends replacing the entire hydrostatic assembly, including hydrostatic release, release rod and all hardware (P/N 9367). Always use original ACR replacement parts. Use of unauthorized replacement parts may void your warranty. Place beacon into the mounting bracket, and replace cover, securing in place with hitch pin going through the hydrostatic release rod.

4.4 The battery (P/N 1096) must be replaced by the date indicated on the beacon. At each inspection, check the time remaining until replacement is required.

NOTE: There are no user serviceable items inside the EPIRB. DO NOT OPEN THE EPIRB UNLESS TO DISABLE IN CASE OF FAULTY ACTIVATION.

Refer all long life battery replacement and other internal EPIRB service to a factory authorized service center.

For the nearest location of a factory authorized service center, call 1-800-432-0227 Ext. 112 (toll free).

4.5 The **GlobalFix™ 406** contain lithium batteries which are not subject to the requirements of the DOT Subchapter C, Hazardous Materials Regulations, because they meet the United Nations Classification of LiS02 Batteries for Shipment of "Non – Dangerous".

5.0 REGISTRATION

5.1 It is imperative that this EPIRB be registered with NOAA (National Oceanic and Atmospheric Administration) in the USA or with your own national authority.

The EPIRB has been programmed with a unique identification

3.7 INTERNAL GPS

3.7.1 The **GlobalFix™ 406** is fitted with an internal Global Positioning System receiver that will determine the navigational coordinates, latitude and longitude, of its position on the globe to be transmitted to the emergency system. When the **GlobalFix™ 406** is turned ON, the GPS is immediately turned ON and it immediately begins acquiring data. Initially the red LED, Light Emitting Diode, flashes once per second to indicate the **GlobalFix™ 406** is turned ON and operating. As soon as the GPS receiver acquires good navigational data the red LED stops blinking and the green LED flashes once per second to indicate that the internal GPS receiver has acquired good navigational data. Once good navigational data has been obtained the GPS receiver waits for 20 minutes before looking for new navigational data again. If for any reason a time period of 4 hours passes without the GPS receiver being able to update the last good set of navigational data, the message transmitted by the **GlobalFix™ 406** will revert back to default data. At this point the green LED will stop blinking and the red LED will flash once per second. If at any time after this, good navigational data is obtained, this data will be transmitted, the red LED will stop blinking and the green LED will flash once per second.

4.0 MAINTENANCE (Check antenna for tightness)

4.1 At least every ninety days, the float free mounting bracket and **GlobalFix™ 406** EPIRB should be inspected for deterioration and/or buildup that may affect the function of the beacon or automatic release.

Also carefully inspect the EPIRB case for any visible cracks. Cracks may admit moisture, which could falsely activate the beacon or otherwise cause a malfunction. Any cracking observed should be immediately referred to ACR for evaluation, (1-800-432-0227 Ext. 112)

4.2 Clean the beacon and the mounting bracket to remove residue buildups. It is recommended that the mounting bracket be waxed with a high quality marine wax.

1.6.2 Specifications

406 MHz Transmitter	
Frequency	406.025 MHz
Frequency Stability	±2 parts per billion/100ms
Output Power	5 watts
Digital Message	
Format	Serialized[1]
Duration	520 ms
Rate	400 bps
Encoding	Biphase L
Modulation	±1.1 radians peak

[1] Leaves ACR with Serialized U.S. code but can be reprogrammed at a Service center to Maritime MMSI.

121.5 MHz Transmitter	
Frequency	121.5 MHz
Frequency Tolerance	±50 ppm
Output Power	25 mW PEP
Modulation	
Type	AM (3K20A3X)
Sweep Range	400 to 1200 Hz
Sweep Rate	3 Hz
Duty Cycle	37.5%

Antenna	
Frequency	406.025 & 121.500 MHz
Polarization	Vertical
VSWR	Less than 1.5/1

Xenon Strobe	
Light Color	White
Output Power	0.75 effective candela
Flash Rate	20—30 per minute

General/Environmental	
Battery Life	
Operating	48 hours minimum
Replacement Interval	5 years
Size	
EPIRB less Antenna	9.0" (22.86 cm)
Antenna	7.5" (19.05 cm)

Material, EPIRB		High impact and UV resistant plastic
Color		Yellow
Weight		2.1 lbs.
Temperature Range		
Operating	Class I	-40°C to +55°C
Stowage	Class I	-50°C to +70°C

Mounting Case (Product No. 2742)

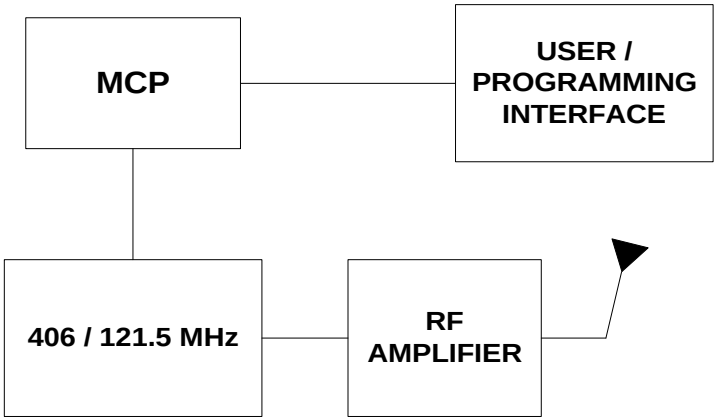
Construction	White High Impact and UV resistant plastic
Size	6.5" x 17.1" (16.51 cm x 43.4 cm)
Release System	Hydrostatic with manual override

Hydrostatic Release Kits

No. 9367	**GlobalFix™ 406**

Optional Mounting Brackets are available for Product No. 2742.

Construction	White High Impact and UV resistant plastic
Size	5.3" x 6.9" (13.5 cm x 17.5 cm)



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PIRB BLOCK DIAGRAM
FIGURE 3

1) Returning the thumb switch to the original OFF position.

If automatically activated:

1) Removing the beacon from the water. The beacon normally takes up to 12 seconds to deactivate, or
2) Placing the beacon back into the release bracket.

3.5.2 If the beacon continues to operate after it has been deactivated, remove the four screws holding the unit together and unplug the battery to disable the unit. Return it to a service center for repair.

3.6 TEST

3.6.1 The **GlobalFix™ 406** can be tested in or out of the release bracket. A Self Test is initiated by lifting the thumb switch to a vertical position and holding it in this position for at least two seconds. The initiation of the test is indicated by a beep and the simultaneous lighting of the red LED.

The sequence of tests is:

1. Check Data Integrity.....Beep and lights up red LED if passed
   .....Stop if failed
2. Check 406 MHz Synthesizer .....Beep and lights up red LED if passed
   .....Stop if failed
3. Check RF Power/Battery .....Beep and lights up red LED if passed
   .....Stop if failed
4. Check internal GPS .....Beep and lights up red LED if passed
   .....Stop if failed
5. Turn on green LED to indicate Successful Test.
6. Flash Strobe Light to test Strobe.

If all of the above occurs, the test has been successful.

NOTE: The homing beacon at 121.5 MHz is inhibited during self test.

3.6.2 It is strongly recommended to test the **GlobalFix™ 406** on a Monthly basis.

3.2 AUTOMATIC DEPLOYMENT & DEACTIVATION
(Product No. 2742 *only*)

3.2.1 Automatic deployment and activation occurs when the vessel sinks and a hydrostatic release device frees the beacon from the bracket allowing it to float to the surface. Built-in sensors detect that the beacon is no longer in its bracket and is in water. This condition will automatically activate the beacon.

Note: Transmissions of the 121.5 MHz and 406 MHz signal will not occur until 50 seconds after activation.

3.3 MANUAL DEPLOYMENT & ACTIVATION

3.3.1 The **GlobalFix™ 406** can be manually deployed by removing the retaining pin, removing the cover, then removing the beacon from the bracket. Once removed, the beacon can be activated by being placed in water or by lifting the thumb switch towards the antenna and placing the thumb switch back down on the opposite side of the EPIRB. Activating the beacon in this manner breaks off the Activation Indicator Plastic Pin and exposes the "ON" symbol " ▮ " on the thumb switch indicating that the beacon is turned "ON".

Note: Some countries fine vessel owners for causing false alarms. The permanent breakage of the Activation Indicator Plastic Pin is a positive indication of a manual activation.

3.4 MANUAL ACTIVATION WITHOUT DEPLOYMENT

3.4.1 The **GlobalFix™ 406** can be activated while still in its bracket by placing the thumb switch in the ON position. Activation by this method overrides all sensors and turns the beacon “ON”.

The caution note above still applies.

3.5 DEACTIVATION

3.5.1 The **GlobalFix™ 406** can be deactivated by:
If manually activated:

SECTION 2 - INSTALLATION (Attach antenna tightly onto unit)

2.1 MOUNTING LOCATION (Product No 2742)

2.1.1 The **GlobalFix™ 406** float-off mounting bracket should be mounted securely to a *vertical or horizontal surface* (the mount has predrilled holes for attachment to a flat surface) where there are no overhead obstructions. Location aboard a vessel must be chosen to allow the EPIRB to float free of sinking craft and as high as possible especially on small vessels. This will help ensure operation of the hydrostatic release unit in the event the vessel capsizes without sinking.

2.1.2 The location selected must be sufficiently rigid to support the weight of the total installation and at the same time consider vibration, exposure to the elements, exposure to surrounding hazards such as equipment movement, doors being opened, accidental covering, personnel traffic, etc., and yet be readily accessible at all times for the emergency use for which the beacon is intended.

2.1.3 Also to be considered in selecting a location for installation is the harmful effect that certain corrosive vapors might have on the beacon. Under no circumstances should a location be selected for installation where the beacon would be jeopardized by any foreign articles being temporarily or permanently positioned during “at sea” or “in port” activities.

CAUTION: Care must be taken to prevent any lanyard, line, or other emergency equipment that may be attached to the beacon from becoming entangled or fouled which could prevent the beacon from being removed in an emergency.

2.1.4 The **GlobalFix™ 406** float-off mounting bracket should be securely attached to the vessel. The use of #10 stainless steel hardware is recommended.

2.1.5 Do not mount the **GlobalFix™ 406** in the vicinity (2 meters) of strong magnetic (such as loud speakers) or electric (such as radar or high power radio transmitter) fields.

2.1.6 Consideration should be given to mounting the **GlobalFix™ 406** in a vertical (antenna upward position). In certain circumstances, such as medical emergencies or disabled vessels, manual activation of the EPIRB for location and homing purposes is sometimes requested. Mounting in this orientation provides the best homing signal.

2.2 VISUAL INSPECTION

2.2.1 Visually inspect the area surrounding the mounting bracket installation site for hidden hazards, obstacles, etc., that may have been overlooked during selection. If there is any doubt as to the ready accessibility to the beacon at all times or if any condition may appear to be questionable, make complete and thorough investigation before making final approval of the installation.

2.3 HYDROSTATIC RELEASE DATING INSTRUCTION

2.3.1 The label on the hydrostatic release mechanism inside of the bracket and the replacement date label on the outside of the bracket MUST be dated with the date of expiration at time of installation according to coastal marine authority regulations.

To record the expiration date on the hydrostatic release mechanism, remove the perforated dates of the label to indicate the month and year two years from date of installation. Write the date of expiration with an indelible marker on the label appearing on the outside cover.

SECTION 3 - OPERATION

3.1 GENERAL

3.1.1 The **GlobalFix™ 406** Beacon Model 2742 is designed to be automatically deployed and activated. The **GlobalFix™ 406** may also be hand held on the deck of vessels, or floated in water and attached to a raft or life vest with the lanyard provided. The **GlobalFix™ 406** is designed to operate best while floating in water. Hand held operation should be avoided when possible.

Do not operate inside liferaft or under any similar cover or canopy.

3.1.2 The **GlobalFix™ 406** Beacon can be deployed and activated manually.

3.1.3 Because many users failed to properly place earlier generation beacons in the “ARMED” or “READY” positions when installing them in their brackets, U.S. and International specifications require the elimination of the “OFF” switch position and the inclusion of sensors to automatically activate the beacon under specific conditions.

The **GlobalFix™ 406** is equipped with sensors to detect when it is no longer in its bracket (a deployment condition) and other sensors to determine if it's in water.

Two conditions must be satisfied for the **GlobalFix™ 406** to automatically activate:

1) It must be out of its bracket,
2) It must be in the water,

Note: Either condition by itself will *not* activate the beacon.

3.1.4 The **GlobalFix™ 406** is designed to allow the user to perform periodic testing while EPIRB is in the release bracket to assure a functioning beacon.

3.1.5 Place the **GlobalFix™ 406** Product No. 2742 into the release bracket with the coiled lanyard inward. The beacon should now be firmly held in the release bracket and ready for automatic deployment.