

OPERATIONAL DESCRIPTION for McMurdo G4 406 GPS EPIRB:

The G4 is a 406MHz float free satellite EPIRB with a built in 121.5MHz homing beacon and GPS module. It is used to locate a vessel or life raft in distress. When activated, the GPS module acquires and decodes the visible GPS satellites data transmissions, and calculates a position solution. If the number of satellites used in the calculation is greater than 3 and the HDOP, (Horizontal Dilution of precision), is less than 4, then the position data is encoded into the 406 message and transmitted, enabling identification of the vessel and its position, to better than 100m. If no valid GPS data is available, a default position is encoded into the 406 message. In this mode, Doppler shift position calculation is used giving a position accuracy of typically 3 km.

The EPIRB comes complete with an automatic release mechanism.

BEACON DESCRIPTION

The G4 consists of two mouldings, a transparent top dome made from Polycarbonate and a main body made from a Polycarbonate/ABS thermoplastic mix. The main body is internally sprayed with a conductive coating to achieve good EMC performance. The two mouldings are screwed together. A gasket made from Sarlink, which is a thermoplastic elastomer, is used to provide a waterproof seal.

The bottom moulding contains the battery pack and a counter balance weight to give good buoyancy characteristics. On the rear of the moulding are two seawater switch contacts and two membrane switches. One membrane switch is labelled HOLD TO TEST/READY and the other is labelled ON. The ON switch is protected against inadvertent use by a plastic cover fitted with a tamper seal. The EPIRB cannot be manually operated unless the tamper seal is removed and the plastic cover slid across to the left of the moulding. The bottom moulding also houses the EPIRB electronics, which are contained on three printed circuit boards. The two main boards are configured as a 'T' with the GPS daughter board mounted on spacers on the rear of the vertical board.

The top dome is transparent so that Xenon tube is clearly visible. The top dome also provides the mechanical fixing for the 406MHz/121.5MHz antenna. A recess in the moulding allows for aligning a light pen for infra-red data programming.

The G4 is programmed via an infra-red data link. This means that a vessel's unique identity number can be programmed into the G4 via a RS232 interface. This data is then permanently stored in the EPIRB. This system enables swift and easy programming of the EPIRB without having to break the watertight seal.

RELEASE MECHANISM

The G4 is protected in a 'floatfree' two-part housing which provides safe storage for the EPIRB until it is required for use. The two-part housing is made from Acrylate

Styrene Acrylonitrile, which is a thermoplastic material. The bottom half contains the release mechanism and is designed to be bolted to a bulkhead.

The release mechanism consists of a stainless steel bracket to support the EPIRB, a spring and a hydrostatic release unit. The bracket containing the EPIRB compresses the spring, and is held in place by a nylon 8mm rod that passes through the hydrostatic release and is secured using a circlip at the base of the bottom housing. The top and bottom housings are then secured together with the aid of an R clip passed through the nylon rod which protrudes through the top housing. The hydrostatic release will operate at a depth of 1.5m-4m. Once activated the hydrostatic release cuts the nylon rod. This releases the spring and forces the two halves apart allowing the EPIRB to float to the surface.