

# RF systems

## RF Systems - Magnetic Longwire Balun "Marine"

The ideal antenna for yachting enthusiasts who want to stay in touch. If you are planning a trip that goes beyond the inland waterways, radio, especially short-wave radio, is an essential part of any communications set-up. Weather forecasts from coastal stations and national broadcasting networks are essential to any safe voyage. With the aid of a decoder, weather maps and NAVTEX reception is also possible - it is no longer a luxury reserved for the commercial craft.

For strong and reliable reception of maritime stations, beware of a simple portable short-wave radio. Coastal stations transmit on a large number of frequencies because reception conditions at night are different from those during the day. Some meteorological stations and the NAVTEX networks use long wave. The receiver should therefore be capable of continuous reception of frequencies between 100 kHz up to 30 MHz. Coastal stations and meteorological services also make use of what is termed "single sideband" modulation. On an ordinary domestic radio, SSB sounds very distorted and the contents of speech are unintelligible. So the radio must have the capability to receive "SSB".

To make voice transmissions easy to follow, the receiver should be able to fine tune in steps of 10 Hz or less. The radio should also offer good stability once tuned in. This is essential if reception of weather charts or NAVTEX is needed.

In addition, the ability to store the channels of frequently used information sources is more than a luxury....in times of trouble it is essential to be able to check frequencies quickly. All these factors mean that you should invest in a good quality, compact communications receiver. This is the next step up from a simple portable short-wave radio.

Communications receivers work best with an external antenna. Most are not equipped with a built-in telescopic whip. Such an external antenna is a problem for the water-sport enthusiast, especially for the yachtsman. There is not enough room for an external long-wire and active antennas for radio and television reception do not work on long-, medium- and short-wave. One solution is the use of an isolated stay (usually at the stern of the craft). Many yachts are now equipped with such a stay as standard. If not, it is easy to isolate the stay with the help of insulators which can be purchased ready-to-mount. The insulators are needed or the weak radio signals will simply leak away via the mast or the stern.

The isolated stay is ideal as an antenna but it is important the signals it receives are connected properly to the front end of the radio receiver. If you simply attach a wire (or coax cable) to the stay, there will be an enormous signal loss in the cable before it reaches the low-impedance (50 ohm) input of the radio.

RF Systems have solved this mis-matching problem. The Magnetic Longwire Balun is a special matching transformer which ensures that any isolated wire with a length of between 6 and 30 metres (18 - 90 ft) will perform as an antenna offering a frequency coverage between 100 kHz - 30 MHz. The MLB also uses coaxial cable between the antenna and receiver, as opposed to a simple open wire. Coaxial cable is easy to secure and ensures excellent screening from nearby interference sources (e.g. on-board computers, fluorescent lights, engine ignition, etc.). The specially designed Magnetic Longwire Balun ensures a perfect match between the antenna and receiver; automatically! This means constant signal levels over the entire long-, medium- and short-wave ranges.

The Magnetic Longwire Balun is a tried and tested design currently used by thousands of short-wave listeners around the world. However, the standard version of this product is difficult to attach to a stay. RF Systems have therefore designed a special marine version of this product. The Magnetic Longwire Balun Marine is the ideal antenna for those who want to combine pleasure at sea with safety.

The Magnetic Longwire Balun (MLB) "Marine" version is a product of RF Systems. It consists of a stainless steel cylinder 8 cm long and with a diameter of 22 mm. The cylinder is filled with epoxy resin which ensures that all the internal components are fully protected against vibration, knocks and the movement of the cable. The MLB is completely waterproof.

The MLB is easily mounted on the isolated stay using the two supplied stainless steel straps. The ideal mounting position for the MLB is just above the insulator (see diagram). This ensures that the coaxial cable doesn't come too close to the stay. Ultra-violet resistant nylon straps are also supplied. These are used to secure the coaxial cable to the remaining part of the stay. The MLB is supplied with 15 metres (45 ft) of coaxial cable. This cable may be lengthened or shortened as desired. A PL-259 connector is also supplied to connect the antenna cable to the back of a communications receiver. Coaxial cable offers a number of advantages. It is resistant to ultraviolet light as well as corrosion by sea water.

It is easy to push the cable through the deck to lower levels, or use nylon clips or straps to guide the cable around walls or skirting-board. All this can be done without reducing the signal level. The receiver is also shielded from nearby electrical apparatus.

The MLB "Marine" from RF Systems also has one more important feature. An isolated stay can cause serious problems during thunderstorms and static build-up. The MLB is designed to allow static electricity, which may build up on the antenna, to leak away harmlessly to earth. This means that the antenna (as well as the sensitive input circuitry of the receiver) can withstand anything except a direct lightning strike. It is essential, however, that the communications receiver is properly earthed.

Connect a thick gauge wire between the earth connector on the back of the receiver to any metal plate or object which is in contact with the water, i.e. the metal hull. In the case of wooden or polyester boats look for a metal plate below the water line attached to the keel or the hull. Please note, however, that the MLB is not intended to be a replacement for a lightning conductor.

The MLB Marine from RF Systems can be used with a wire as short as 6 metres (18 ft) which is adequate for reception of the short-wave spectrum (1.6-30 MHz). If good performance on long- and medium-wave is required, then the minimum length of the isolated stay should be 12 metres (36 ft). Note that the stern stay is not necessarily the only possibility. Any isolated wire suspended above the deck is a suitable antenna. The best omni-directional sensitivity is obtained when the antenna wire is hung vertically or at an angle. For yachts without a suitable isolated stay, RF Systems has also developed the DX-7, a small completely waterproof active antenna designed for the frequency range 50 kHz - 35 MHz. The DX-7 can be powered from 12 V DC on board supply.