

GUIDE TO MARINE RADIO

Introduction...

This guide will help you choose the most suitable radio products to help you while communicating at sea. It is not intended to replace guidance from professional radio resellers, but to provide a background to the different types of product available and help you make an informed choice.

VHF

The most popular method of communicating with other boats is via Very High Frequency (VHF) radio. This is similar to the way that commercial radio stations (Radio 1, Classic FM etc.) transmit. It has the advantage that equipment is relatively simple, and can therefore be compact and low cost. To ensure that maritime users do not interfere with other radio users a part of the radio spectrum has been allocated specifically to this group and to make operation as simple as possible frequencies have been put into numbered channels.

For example Channel 16 actually refers to 156.800 MHz, it is far easier to refer to channel numbers. Because radio does not recognise geographic or political boundaries, and to ensure that boats travelling on trans-national voyages can always communicate, the VHF marine band is the same all around the world. There are 55 international marine channels, a similar number of private channels (allocated on a local basis to commercial organisations) and some other unique national channels.

The USA and Canada have a slightly different use of marine channels, using the same frequency but using more simplex rather than duplex channels. National channels include WX (weather) channels in the US, Fishing channels in Norway and the marina channels M and M2 in the UK. To make sure that your radio is fitted with the correct local channels, be sure to purchase type-approved equipment. As mentioned previously, VHF radios can be quite small and they are available as both handheld and fixed (installed) units.

Handheld

Handheld VHF radios work in exactly the same way as their fixed equivalents. Many of the features are shared and in Icom's range they even follow the same operating protocol to help users who use both types. As with any tool there are advantages and disadvantages. Advantages include small size and portability, usefulness in an emergency, independence from the vessel's power and antenna. Disadvantages are related to the power output and battery life, which affects range and how long the equipment can be used. However the Icom IC-M1EuroV improves on this situation

combining Li-Ion battery technology which allows a handheld to be run for at least 27 hours. Other Icom handhelds available are the IC-446S, a superb licence free UHF transceiver; the IC-M3Euro a water resistant transceiver which because it can use alkaline batteries acts as an important backup to fixed radios; and the IC-GM1500E, a safety GMDSS transceiver designed for commercial vessels.

To summarise, handhelds are most suitable for small vessels without their own battery source; emergency back-up to fixed radios or additional radios for crew and tenders etc.

Mobile

For vessels with battery power, a fixed radio is usually a good choice. Several models are usually available with varying features, although the basic radio functions remain the same. With the advent of DSC Icom have produced a VHF transceiver that is DSC compatible called the IC-M501. Its associated unit is the DS-100 (Class D DSC controller). Both are traditionally designed to fit neatly in any cockpit or helm. Fixed radios do require installing and this will include connection to a power source and an antenna. When thinking about where to site your radio you should think about how it will be used. You will probably need to use it whilst navigating, but may need to use it at the helm when entering or leaving port. Think carefully before installing.

Installation Range

Many customers ask us about the range (distance) over which a radio can communicate and it is the most popular question, with the hardest answer. Basically, radio travels as waves, similar to light. Like light it can be reflected, reduced or even stopped by other objects. A popular response is 'line of sight' which essentially means 'if you can see it you can talk to it' and this is generally a good guide.



Remember however that the radio signal comes from the radio aerial (not the radio itself) and therefore using a higher antenna allows the radio to 'see' further. The same rules apply for receiving a signal, although of course base station aerials are mounted on very high masts and have much higher power, which is another influencing factor.

A stronger, more powerful light can be seen further and more clearly and the same applies to radio. Power is measured in watts and the higher the power the further the range, but it's not quite that simple. Even a very low power can give some range. Power can be used to improve the quality of signal and to overcome some obstacles. Remember though, more power out means more power in so shorter battery life for handhelds or non-recharging batteries. Always start with the lowest power setting and work up. All fixed sets have at least two power settings, 1 watt and 25 watt. Handhelds have various power levels, Icom's being typically 2.5 watt to 5 watt as standard, with 6 watts optional battery.

Because VHF travels in straight lines, like light, as you travel away from land the curvature of the earth prevents the signal from reaching you. This happens between 35 and 50 miles off shore and as you still need to communicate you need to look for some other way of doing it.

MF/HF/SSB

Longer distance (beyond VHF) communications are achieved using an MF/HF/SSB radio. MF means medium frequency and gives a range of up to 200-250 miles from shore, HF or high frequency extends that range to thousands of miles and maybe even global. SSB means single side-band and this is the mode that the radios use to communicate. This subject can quickly become very technical and we will not therefore dwell on the whys and wherefores. Plenty of books exist for those who want to know more.

Installation

As HF relies on propagation to achieve its long range it is essential that the signal is given the best start it can get. This generally means that the antenna and RF ground need to be optimised. Whilst an ATU will help with the antenna the RF ground and power supply are a little more complex and require a degree of technical knowledge and experience. For this reason we advise customers to seek professional advice on HF installations.

It is worth noting that this equipment may be used in a safety of life situation and cutting corners to save a few pounds is really not worth the risk. Equipment draws a high current when transmitting and can affect other instruments such as GPS, autopilots etc.

Operation

All radios require the user and the vessel to hold a relevant licence. The vessel's licence is like a car Tax disc, but is also the key to obtaining an MMSI number, which will uniquely identify your vessel. The user requires a radio 'driving licence' and two

different types are available. For VHF only the SRC (Short Range Certificate) is available. Training takes one day and this essentially instructs users in radio etiquette and procedures, since VHF operation itself is fairly straightforward. For other communications (HF, Satcom etc.) the LRC (Long-Range Certificate) is required. This covers procedures, setting up an HF call etc. and takes about 3 or 4 days. Courses are available nation-wide although it is best to choose a course that is RYA registered.

Other Icom guides include:

- What is DSC? - an overview of DSC with explanations about GMDSS, SOLAS, MMSI etc.
- What is PMR446? - the benefits of this popular licence-free service.

Forthcoming guides include:

- Type approval and EMC.
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Icom (UK) Ltd

Sea Street, Herne Bay, Kent CT6 8LD

Telephone: +44 (0)1227 741741

Fax: +44 (0)1227 741742

e-mail: info@icomuk.co.uk

or visit our Website on: www.icomuk.co.uk

Count on us!