

# 10 COMMUNICATIONS

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## INTRODUCTION

### **SAFETY**

Possibly one of the best ways to ensure your safety when on the water is to have appropriate communications equipment onboard with the ability to communicate easily with other vessels and shore stations when the need arises. It could be argued that anyone who operates a boat almost anywhere should be required to have a radio onboard and know how to use it.

Sound and whistle signals, discussed in the *Navigation Rules* chapter, are okay for negotiating agreement on passing or crossing situations with other vessels; however, using a radio for this purpose is a safer way and has become common practice. And when you need to make that emergency call for help; a radio call is much more intrusive and more likely to get attention than a signal flare, which requires someone to just happen to be looking in your direction. A handheld VHF radio can be had for as little as \$99, so there's really no excuse for not having one onboard.

### **TYPES OF MARINE COMMUNICATIONS EQUIPMENT**

These days there are lots of choices when it comes to types of marine two-way communication equipment, what with marine radiotelephones, citizen's band radios, cellular phones, satellite phones, satellite radios, etc. Of course, the one thing all these have in common is they are all, at heart, a type of radio.

All these communication devices can be somewhat arbitrarily lumped within one of two broad categories that we'll define here as:

- **Point-to-point communications:** The everyday telephone in our houses, the cell phone and the satellite phone are all examples of point-to-point communication devices. You call a specific location and talk only to the person at that location. No one else hears the conversation (at least they're not supposed to).
- **Two-way broadcast communications:** Marine purposed VHF and SSB radios and also CB radios fall within this category. When you transmit, you are heard by everyone who is within range and has similar equipment tuned to

Of these, the VHF radio is the most relevant to the average recreational boater and will be covered in some detail here. The SSB marine radio is of importance to those cruising offshore, and I'll describe what this is and how it works, but I won't get into too much detail. CB and FRS, although not designed for marine use, can also be handy to have, so I've included few remarks on both of these. Information on the ham radio is omitted since an onboard ham radio station is not likely to be of interest to anyone but an already licensed ham radio operator.

## **VHF MARINE RADIO**

### **Regulations**

Much of the information in this chapter on U.S. regulations regarding radio licensing was found at [wireless.fcc.gov/marine](http://wireless.fcc.gov/marine).

#### ***Who Is Required to Have a Radio?***

The VHF radio is the workhorse marine radio that every boater should have whether it's legally required or not. In the United States, any recreational vessel over 20 meters (65.6 ft) in length is required to carry a radio, as are most commercial vessels. These are known as ***compulsory ships*** because they are compelled to carry a radio. Recreational vessels less than 20 meters are not required to carry a radio, but may do so, and if they do are known as ***voluntary ships***.

#### ***Radio Licensing—United States***

Any vessels that have a SSB radio installed, or a satellite communications system installed, must have a ship ***radio station license***. In the United States, a recreational vessel is not required to have a station license for a VHF radio, radar, or EPIRB on a voluntary ship unless the vessel voyages to a foreign country (including to Canada). Note that this requirement is as per U.S. FCC regulations, and that the foreign country to be visited will usually expect you to be licensed also. If your vessel is licensed, all communications equipment onboard is authorized under a single ship radio station license.

If you plan to dock in a foreign port you must also have a ***Restricted Radiotelephone Operator Permit***, also referred to as an ***individual license***. The ship radio station license and the restricted radiotelephone operator permit are both obtained by filing FCC Form 159 and 605 with the FCC. No test is required.

## 578 Boater's Pocket Reference: Chapter 10

Communication Type	Channels		
	United States	Canada	
		West	East
International distress, safety, and calling: Used to get the attention of another station (calling) or for emergencies. Ships carrying a radio maintain a listening watch on this channel. The Coast Guard monitors this channel.	16		
Supplemental calling channel for recreational boaters: Assigned by FCC to relieve congestion on channel 16.	09	---	
Working channels: these channels may be used as working channels by recreational boaters for vessel operations communications.	09 68 69 71 72 78 {79} {80}	{65A} 66A 67 {68} 69 71 72 73 74	{09} 10 {66A} {68} {71} 72 74
Navigation Safety (Bridge to Bridge): passing, meeting, overtaking, etc.	13 {67}	13	
Intership Safety: Intership safety messages & search and rescue messages.	06		
Coast Guard Liason: Used to talk to the Coast Guard (after calling on 16).	22A		
Maritime Safety Information Broadcasts: Canada: Continuous Marine Safety Broadcast (CMB).	22A	Wx1 Wx2 Wx3 21B {25B} {28B} {83B}	
Weather: National Oceanic and Atmospheric Administration (NOAA) broadcasts.	Wx1-Wx7		
Public Correspondence: used to call the marine operator at a public coast station to make and receive calls to shore based (public phone system) telephones.	24-28 84-87 {88}	01-03 23-28 60 64 84 86	24 26 27 85 87 88
Digital Selective Calling (DSC): -automated calling by radios equipped with DSC.	70		
Channels in {} See Table 10-1 Channel Notes On Next Page			

*TABLE 10-1: Summary of Channels Available for Recreational Boaters*

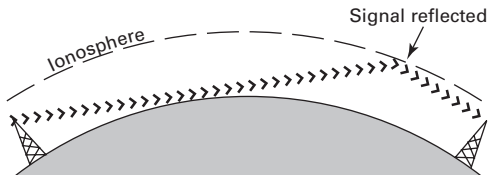
## MAYDAY Call Procedure

Use the MAYDAY call only when you are in distress. Distress is a situation where you or your boat are threatened by grave or immediate danger.

1. If within VHF range use VHF rather than MF/HF radio.
2. Make sure the radio is ON.
3. Set VHF channel 16 or MF/HF 2182 kHz
4. Transmit: MAYDAY MAYDAY MAYDAY
5. This is: _____ Boat Name Boat Name Boat Name
6. Our position is: Latitude ____ deg ____ min N or Longitude ____ deg ____ min W Our position is _____ Distance (miles, ft, km, m, etc.) Direction (NE, SW, or bearing deg) Navaid or Landmark
7. State problem: _____ We are sinking, on fire, or have a heart attack, etc.
8. State urgency _____ How long you can stay afloat, etc.
9. We need: _____ Describe assistance required, pumps, tow, medical, etc.
10. Number of persons on board is _____ and _____ adults children The number of injured is: _____
11. Our vessel is a _____ foot powerboat / sailboat
12. OVER
13. Release transmit and listen for a reply If no-one answers repeat steps 4-13

FIGURE 10-1: Mayday Example Call Procedure

tion, by using frequencies that allow radio signals to bounce off the ionosphere and back to earth. The MF/HF radio is also commonly called a *SSB (single side band) radiotelephone* or *marine radio*.



*FIGURE 10-3: MF/HF Radio Waves and the Ionosphere*

The MF/HF radio is actually a shortwave radio designed specifically for marine use and has selectable channels much like a VHF radio.

A MF/HF radio should be considered a necessity by anyone venturing offshore even though some form of satellite communications might also be available. Marine safety bulletins, weather broadcasts, and even weather faxes can be received with a HF radio. In addition to the safety aspect, marine nets have become commonplace, where like-minded cruisers discuss topics of mutual interest at sea.

Email services are also available for HF, although they are slow and need favorable conditions. If you can afford it, some form of satellite communications is a better alternative for email.

### **MF/HF Channels**

Use of the MF/HF radio is somewhat similar to the VHF radio, in that there are calling channels and working channels; however, the MF/HF radio differs in that there are a number of frequency bands with a number of channels in each band and within each band there are calling channels and working channels. The frequency bands used are 2 MHz, 4 MHz, 8 MHz, 12 MHz, 16 MHz, 18 MHz, 22 MHz, and 25 MHz. The 2 MHz band is a MF band and the 4 MHz through 25 MHz bands are HF bands.

Channels numbers are constructed by appending a number, that increments sequentially starting from 01, to the one or two digit band number. For example in the 4 MHz band the chan-

The original cell phone system was analog and some of the car phones and the old "bag" phones operated at 3 watts, while most cell phones sold now are digital and transmit at a maximum power of 0.6 watts. Most digital cell phones revert to analog mode if a digital signal is not available, but they still are limited to 0.6 watt power. With this low power you'll be lucky to get a digital cell phone to operate more than 5 miles from the nearest cell phone tower which is, of course, located on the shore somewhere. As you know from personal experience, once you get far away from towns or highways, the chances of hooking up are slim.

You can purchase cell phone amplifiers and antennas that will considerably improve your communication range and quality with cell phones. Just the use of a good antenna mounted high on the boat will improve operation considerably and adding an amplifier that can boost the signal to 3 watts (the legal limit) can increase useful range to 10 or 15 miles and maybe a little beyond.

## **SATELLITE COMMUNICATIONS**

### **Introduction**

Discussions herein are limited to two-way communications systems; broadcast radio and television communications are not covered.

*INMARSAT*, *Iridium*, and *Globalstar* are the leading providers of two-way satellite communications services of interest to recreational boaters. INMARSAT has been providing service since the late 1980s and uses four high earth orbit geosynchronous satellites whereas the newer providers, both Iridium and Globalstar, use many low earth orbit satellites.

There are other suppliers currently in this market and more are entering all the time. Change is taking place so rapidly, particularly with respect to Internet access, that any discussion beyond the big three providers is likely be obsolete by the time this book gets published, so we'll restrict ourselves to a brief discussion of these three.

Anyone planning to invest in a satellite communications phone needs to understand that each of these systems has definite strengths and weaknesses, and the homework needs to be done before committing to any particular system. Example prices shown here are from various Internet sites and are current as of 2005. Prices are generally trending downward for all the satellite services, so expect to do as well or better for any of these services in the future.

for these ground-based services and will need to have a different phone number (in the same phone). Like the Iridium handheld phone, this phone must usually be used outdoors.

Although Globalstar isn't truly global, they have generally cheaper rates if one is willing to commit to a monthly plan, much as one does with a cell phone. Examples of monthly plans for the United States and Caribbean zone include: 50 minutes for \$50/month = \$1/minute, 150 minutes for \$65/month = \$0.43/minute, or 4000 minutes for \$550/month for a unit cost of \$0.14/minute. Calls outside of the domestic zone (roaming) are about \$1.39/minute and don't use up minutes from the monthly plan. This includes calls to and from Europe. Calls from Canada are just \$0.75/minute.

### Satellite Phone Rentals

All the three types of satellite phones are available for rental on a daily, weekly or monthly basis which may make sense for cruising less than a month a year. These are also handy if you need to make calls from a cruise ship as the rates are much cheaper than the ship's rates which can be over \$10 per minute.

## TABLES

### THE RADIO ALPHABET

A	Alpha	N	November
B	Bravo	O	Oscar
C	Charlie	P	Papa
D	Delta	Q	Quebec
E	Echo	R	Romeo
F	Foxtrot	S	Sierra
G	Golf	T	Tango
H	Hotel	U	Uniform
I	India	V	Victor
J	Juliet	W	Whiskey
K	Kilo	X	X-ray
L	Lima	Y	Yankee
M	Mike	Z	Zulu

TABLE 10-5: The Radio Alphabet

Flags	Signals
A	Diver down; keep well clear at low speed.
B	Loading, discharging, or carrying dangerous cargo.
C	Yes or affirmative.
D	I am maneuvering with difficulty; keep clear.
E	I am changing my course to starboard.
F	I am disabled; communicate with me.
G	I require a pilot.
H	I have a pilot onboard.
I	I am changing my course to port.
J	I am on fire and have dangerous cargo; keep clear.
K	I wish to communicate with you.
L	You should stop your vessel immediately.
M	My vessel is stopped; making no way.
N	No or negative.
O	Man overboard.
P	About to leave port; return to ship.
Q	Request pratique; ship meets health regulations.
R	No code.
S	Moving astern.
T	Keep clear.
U	You are running into danger.
V	I require assistance.
W	I require medical assistance.
X	Stop carrying out your intentions and watch for my signal.
Y	I am dragging anchor.
Z	I require a tug.
AC	I am abandoning my vessel.
AE	I must abandon my vessel.
AE1	I (or crew of vessel indicated) wish to abandon my (or their) vessel but have not the means.
AE2	I shall abandon my vessel unless you will remain by me, ready to assist.
AF	I do not intend to abandon my vessel.
AF1	Do you intend to abandon your vessel?
AN	I need a doctor.
BR	I require a helicopter urgently.
CB	I require immediate assistance.
CB4	I require immediate assistance; I am aground.
CB5	I require immediate assistance; I am drifting.
CB6	I require immediate assistance: I am on fire.
CB7	I require immediate assistance; I have sprung a leak.
CJ	Do you require assistance?

TABLE 10-8(1): International Code of Flag Signals