

COMMUNICATION

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VHF Radios

Very High Frequency (VHF) radios have been around for many years and remain the primary means of communication for vessels throughout the United States. The main uses of a VHF radio are:

1. Distress calling and safety.
2. Ship to shore communications.
3. Navigation (vessels to bridges, etc.)
4. Marine operator to place calls to shore
5. NOAA Weather Broadcasts.

They come equipped with a choice of transmitter power: one (1) watt for very close communication (approximately one mile or less) or twenty five (25) watts for extended communication (up to approximately twenty five miles). All of this is done usually with the push of a button.

If you need to communicate over a greater distance consider installing a Single Side Band (SSB) radio - which has the capability to transmit over hundreds of miles. If you are

not sure whether you might have the need for Single Side Band radio please feel free to contact us at your local BOAT/U.S. Marine Center and we can discuss the pros and cons.

1. VHF radios come in many shapes, sizes and colors to meet anyone's needs
2. today. Prices start at about \$119.00 for a basic model and can go as high as
3. \$1100.00 for the full - featured units. The main factor governing prices of the VHF
4. radios are the features available.
5. When choosing a VHF radio you should first
6. make a list of the features you feel you want and need.
7. For additional information
8. on VHF Radios, be sure to check out the BOAT/U.S. Foundation Findings at
9. www.boatus.com/foundation!

Licensing

As of October 26, 1996, most recreational boaters are no longer required to obtain an individual Ship Station License from the Federal Communications Commission (FCC). However, boaters still need a VHF Ship Station License in the following categories:

1. Those traveling to or broadcasting in a foreign port (including Canada, Bahamas, Caribbean)
2. Those with boats 65 feet or longer
3. Those using single sideband radios or Inmarsat equipment
4. Commercial vessels.

Those traveling to or broadcasting in a foreign port must also obtain a Restricted Radiotelephone Operator's Permit (RP).

However, if you

1. Merely plan to sail in domestic or international waters without docking in any foreign ports and without communicating with foreign coast stations, and
2. Your radio operates only on VHF
3. frequencies

You do not need an RP.

For more information, contact the FCC toll-free at 800-322-1117 and request a copy of Fact Sheet Number 14.

Use FCC Form 506 to apply for a Ship Station License. No test is required. The license currently costs \$75 for a ten-year term. You may not transfer this license to another person or boat. If you buy a used boat that is already equipped with a licensed VHF radio, you will still have to apply for a new Ship Station License.

Use FCC Form 753 to apply for an RP, if required. The RP currently costs \$45 and is issued for your lifetime. You must be at least 14 years old and no test is required.

Firms can be obtained from your nearest FCC field office or from the FCC Wireless Communications Division (see below). Call the Gettysburg office to locate your nearest field office, or call the FCC Form Distribution Center at 800-418-FORM (3676). Return forms to:

FCC Wireless Communications Bureau, 1270 Fairfield Road, Gettysburg, PA 17325
1-800-322-1117

Channels

Most VHF radios on the market today have in excess of twenty-two usable channels. Aside from the U.S. channels there are also International and Canadian channels, all of which come standard with many of the newer units on the market.

The most important channels on your VHF radio are 13, 16, 19, 22, and 70. Channel 13 is used by commercial shipping to communicate their actions and confirm passage. Channel 16 (156.8 MHz) VHF-FM is designated by the FCC (Federal Communications Commission) as the national distress, safety and calling frequency. All vessels must monitor this channel while underway. Calls to other vessels are normally initiated on Channel 16 except for recreation vessels which may use (voluntarily) Channel 09

VHF-FM. The FCC has designated Channel 09 as a recreational calling channel in order to eliminate congestion on Channel 16 VHF-FM. However, it is important to take note that the United States Coast Guard does not monitor Channel 09 VHF-FM for distress calls. Any vessel in distress should use Channel 16 VHF-FM (which the Coast Guard does monitor). Channel 22 is the most common working channel for USCG in the event of an emergency.

The following list of channels are those available in the United States for VHF Radio communications. Always remember to check locally for channels authorized for use in your area as well as any local restrictions.

Channel 16 -- Distress calling and safety, ship-to-ship and ship-to-coast. Users must switch to a "working" channel after making initial contact (except in emergencies). All vessels must monitor Channel 16 when not using the VHF radio for other purposes.

Channel 09 -- Secondary calling channel (a new FCC Rule has designated Channel 9 to be the preferred channel for calling). The purpose of this change is to free Channel 16 for distress calls.

Channel 06 -- Ship-to-ship safety messages, and communication with search and rescue and Coast Guard vessels and aircraft.

Channel 13 - Ship to bridge or lock master, ship to tender calls. Commercial vessel use primarily. One watt of power, used for close in communicating.

Channel 22 -- Used to speak with Coast Guard after initial contact on Channel 16.

Channel 68, Channel 69, Channel 71 and Channel 72 -- Used solely for communications between vessels.

Try to remember that your VHF is not a private telephone. It's more like an old-fashioned party line. Everyone can hear your conversation. Keep the conversation short and to the point as there will be others waiting to use the channel. Also, do not allow children play with the VHF radio.

Channel 01, Channels 07 through 11, Channel 18, Channel 19, Channel 63, Channel 67, Channel 79 and Channel 80 -- Commercial working channels and are reserved for commercial vessels only. Also note that Channel 63 has no listen.

Channels 24 through 28 and Channels 84 through 88 -- Are reserved for Marine Operator communications for the purpose of sending or receiving ship-to-shore phone calls. There is a charge for these calls, which is either applied to a personal account with the phone company or treated as a collect call. All of these marine communication services, (except for distress calls) - cost money.

Channel 13 and Channel 67 -- These are navigational channels. Channel 13 (all vessels) is for one watt of transmission power only. Channel 67 (Commercial Only) is for

one-watt transmission power only. These radio channels are also known as the "bridge-to-bridge" channels. These channels are used for listening to ship movements in tight waterways, locks, etc.

Channel 70 -- Digital Selective Calling. Those few vessels with DSC radios should use this channel for distress and calling channel instead of 16. DSC may become mandatory by about the year 2000.

Channel W1 through Channel W10 -- These channels are reserved for weather transmissions. For the most part only Channels W1 through W4 are receiving weather broadcasts from NOAA. These are receive-only channels.

ALL OTHERS - Virtually every radio manufactured today has every available channel.

If your radio has channels that you do not see on this list do not use them. These extra channels are reserved for government, commercial, or vessel use only.

Antennae

After you decide which VHF radio is best for you, your next step is to pick out an antenna. The VHF antenna is a very important part of your VHF Radio System. VHF antennae come in many lengths and types so, before buying a VHF antenna contact an expert and determine which style best fits your needs. If you buy the wrong antenna you will not get the performance your VHF radio is capable of producing. VHF and DSC equipment are made up of three distinct parts - each part is equally important. These pieces are:

- a. The transceiver
- b. The coaxial cable with its connectors carrying the signal to or from the antenna and
- c. The antenna itself. Even today the cables, connectors and antennae often do not get the attention they demand.

Yet, their individual functionality has a notable effect on the performance of the system as a whole. The wrong antenna or a damaged or poor quality coax cable can drain the transmission power therein wasting the money spent for a good installation. At every frequency, besides being free from obstacles, the antenna has to meet precise electrical and electronic requirements.

When choosing an antenna it is advisable to discuss with your dealer all the problems connected with the installation, use of the equipment and the type of transceiver needed. This will allow you further understand and tackle many problems before they arise. In case this sort of advice is not available to you, the information provided below should be helpful in the selection of the proper antenna.

GAIN - The "gain" is singularly the most important specification of the antenna. It is indicated in dB (Decibels) which briefly means this: the higher dB

numbers, the greater the range. On the other hand, a high gain will decrease the antenna radiation patterns. This means that low gain antennae are less influenced by the rolling and pitching of a boat. With increased gain, the pitching movement of the boat may cause a temporary signal reduction. These are the reasons why on the faster planning boats it is recommended that a high gain antenna be used. Conversely, on sailboats, with a masthead installation and with the mast subject to swaying, it is recommended that the 3 dB gain antenna be used.

HEIGHT- In general, the higher the antenna, the better the range of your radio. VHF's transmit via "line-of-site" radio waves--therefore the higher the antenna, the farther your signal will reach over the horizon. You may be able to talk to the local Coast Guard station that may be over twenty miles away (because they have a very tall radio tower) but not your friend who is only a few miles away as their antenna is only a few feet above the water. Having an antenna with the right gain, and located as high as practicable, will give you the optimal operating conditions for using your VHF radio.

Communicating

Using a VHF radio is one of the easier things to do on a boat, but there are things you need to do to operate a VHF properly. Most VHF radios have some or all of the following:

Volume knob

"Squelch" knob. Adjusting the squelch is similar to tuning your radio--it will make the signal sound much more clear.

Channel knob or up/down buttons. This lets you change the channel you are using.

Channel display screen. This tells you what channel you are on, and also any other feature that you may be using.

Weather button. This is a direct way to get to your local weather channels.

Scan Button. This will automatically change your radio channel to one that is currently being used by other boaters. You may also be able to "Priority scan" which will allow you to program specific channels that you frequently use.

16/9 button. Automatically takes you to either channel 16 or 9.

1/25 or hi/lo button. This allows you to raise or lower the power with which you broadcast your signal. For boats close to you, use low power. For boats farther away, use high.

INT/USA. Allows you to change channel type if you leave the United States for other countries such as Canada.

Transmit button. This is usually on the mike. Simply push it down, and your radio will transmit a signal.

To use your VHF, turn it on and pick a channel, set the squelch to the point where you don't hear any white noise, and begin talking. Things to remember when you are on the radio:

Monitor channel 16 when you are not talking. While not required for recreational boaters, it is an unwritten rule for radio users.

Don't tie up channel 16 or channel 9. If you are talking with someone, switch to a working channel so you are not keeping others from using channel 16 or 9. In some instances, the Coast Guard may even order you to switch channels if you are abusing these channels.

A VHF radio is not a telephone. When you use your VHF, everyone tuned to that station in the area can hear you! Watch your language, and try to keep your conversations short and to the point so that others may use the channel.

In emergency situations, there are certain procedures to follow to ensure prompt response to your need for help.

Visual Distress Signals

The Regulations

This information is directed primarily to recreational boaters, but the requirements discussed also apply to operators of vessels engaged in the carrying of six or fewer passengers. The Visual Distress Signal requirements for most commercial vessels are in Title 46 of the Code of Federal Regulations.

The requirement to carry visual distress signals became effective on January 1, 1981. This regulation requires all boats when used on coastal waters, which includes the Great Lakes, the territorial seas and those waters directly connected to the Great Lakes and the territorial seas, up to a point where the waters are less than two miles wide, and boats owned in the United States when operating on the high seas to be equipped with visual distress signals.

The only exceptions are during daytime (sunrise to sunset) for:

1. Recreational boats less than 16 feet in length
2. Boats participating in organized events such as races, regattas or marine parades.
3. Open sailboats not equipped with propulsion machinery and less than 26 feet in length.
4. Manually propelled boats.

These boats only need to carry night signals when used on these waters at night.

PYROTECHNIC VISUAL DISTRESS SIGNALING DEVICES... must be Coast Guard approved, in serviceable condition and stowed to be readily accessible. If they are marked

with a date showing the serviceable life, this date must not have passed. Launchers produced before Jan. 1, 1981, intended for use with approved signals are not required to be

Coast Guard Approved.

USCG Approved Pyrotechnic Visual Distress Signals and Associated Devices include:

1. Pyrotechnic red flares, hand held or aerial.
2. Pyrotechnic orange smoke, hand held or floating.
3. Launchers for aerial red meteors or parachute flares .

The purpose of the regulation is to assure that boaters have a way of attracting attention and securing assistance should the need arise. Properly used visual distress signals will also help reduce the time it takes to locate a boat in difficulty when a search is underway. This will reduce the possibility of a minor emergency becoming a tragedy.

NON--PYROTECHNIC VISUAL DISTRESS SIGNALING DEVICES... must carry the manufacturer's certification that they meet Coast Guard requirements. They must be in serviceable condition and stowed to be readily accessible.

This group includes:

1. Orange distress flag.
2. Electric distress light.

No single signaling device is ideal under all conditions and for all purposes. Consideration should therefore be given to carrying several types. For example, an aerial flare can be seen over a long distance on a clear night, but for closer work, a hand-held flare may be more useful.

Visual Distress Signals: Types

A wide variety of signaling devices, both pyrotechnic and non-pyrotechnic, can be carried to meet the requirements of the regulation. Recreational boats less than 16' operating in coastal waters need only carry night signaling devices when operated at night. All other boats must carry both night and day signaling devices.



Note: If pyrotechnic devices are selected, a minimum of three must be carried. Any combination can be carried as long as they add up to three signals for day use and three signals for night use. Three day/night signaling devices meet both requirements.

The following details a combination of devices which can be carried in order to meet the requirements:

1. Three hand-held red flares (day and

- night).
2. One electric distress light (night only).
3. One hand-held red flare and two parachute flares (day and night).
4. One hand-held orange smoke signal, two floating orange smoke signals (day) and one electric distress light (night only).

DAY USE ONLY

1. Floating Orange Smoke Distress Signals (5 minutes)
2. Hand Held Orange Smoke Distress Signals
3. Floating Orange Smoke Distress Signals (15 minutes)
4. Orange Distress Signal Flag for Boats

NIGHT USE ONLY

1. Electric Distress Light for Boats

DAY AND NIGHT USE

2. Hand Held Flare Distress Signal
3. Parachute Red Flare Distress Signals (25 mm or larger) These signals require use in combination with a suitable launching device.
4. Hand Held Rocket-Propelled Parachute Red Flare Distress Signals.
5. Distress Signal for Boats, Red Aerial
6. Pyrotechnic Flare (These devices may be either meteor or parachute assisted type.)
7. Some of these signals may require use in combination with a suitable launching device.

Warning . . .

In some states the pistol launcher for meteors and parachute flares may be considered a firearm. Therefore, check with your state authorities before acquiring such launcher.

All distress signaling devices have both advantages and disadvantages. The most popular, because of cost, are probably the smaller pyrotechnic devices. Pyrotechnics make excellent distress signals, universally recognized as such, but they have the drawback that they can be used only once. Additionally, there is a potential for both injury

and property damage if not properly handled. Pyrotechnics devices have a very hot flame, and the ash and slag can cause burns and ignite material that burns easily. Projected devices, such as pistol launched and hand-held parachute flares and meteors, have many of the same characteristics of a firearm and must be handled with the same caution and respect.

SOLAS-grade flares and smoke devices are brighter and more reliable than the usual flares. SOLAS-grade devices are recommended for offshore or coastal use where increased visibility may be the difference between rescue and loss. SOLAS-grade flares must also be USCG-approved.

The hand-held and the floating orange smoke signaling devices are good day signals, especially on clear days. Both signals are most effective with light to moderate winds because higher winds tend to keep the smoke close to the water and disperse it which makes it hard to see.

Red hand-held flares can be used by day, but are most effective at night or in restricted visibility such as fog or haze. Only Coast Guard flares are acceptable for use on recreational boats. When selecting such flares look for the Coast Guard approval number and date of manufacture. Make sure that the device does not carry the marking: "Not approved for use on recreational boats," and that no more than 3 years have passed since manufacture.

DISTRESS FLAG

The distress flag must be at least 3 x 3 feet with a black square and ball on an orange background. It is accepted as a day signal only and is especially effective in bright sunlight. The flag is most distinctive when waved on something such as a paddle or a boat hook or flown from a mast.

The electric distress light is accepted for night use only and must automatically flash the international SOS distress signal, which is three short flashes, three long flashes, and three short flashes. Flashed four to six times each minute, this is an unmistakable distress signal, well known to most boaters. The device can be checked any time for serviceability if shielded from view.

Although not recognized by USCG as a carriage requirement, a well-handled signal mirror can be very effective in calling attention to oneself. It is low in cost and has no shelf life.

Sea-marker dye is also useful when air search has been initiated. Full instructions on its use are on the container.



NOTE: An ordinary flashlight is not acceptable since it must be manually flashed and does not normally produce enough candle power. The Regulation States: "No person in-a boat shall display a visual distress signal on water to which this subpart applies under any circumstances except a situation where assistance is needed because of

immediate or potential danger to the persons aboard."

Visual Distress Signals: When and How to Use Them

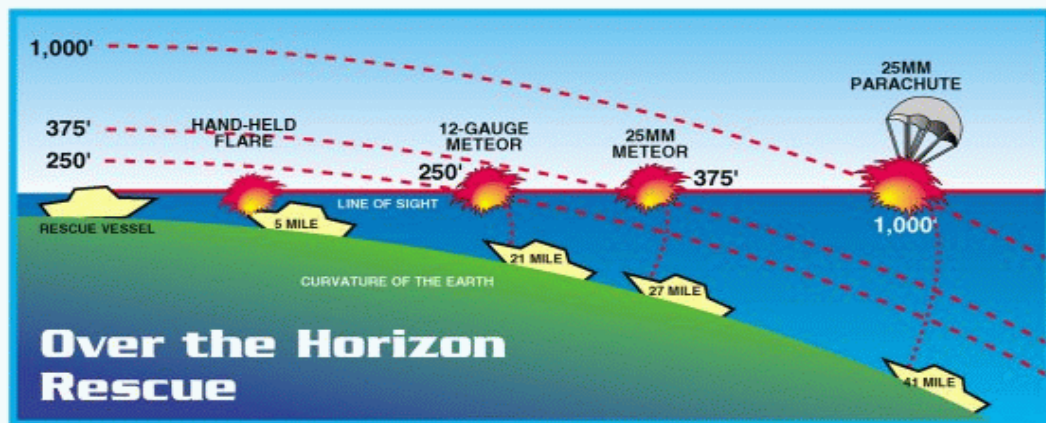
Visual distress signals are part of your boat's safety equipment. Check them before you leave harbor. Their intended purpose is to summon help should the need arise. Visual distress signals can only be effective when someone is in a position to see them. Therefore, when employing pyrotechnic devices, do so only when you see or hear a boat or airplane or you are reasonably sure that someone on shore is in position to see your signal and take action. Good judgment is an essential part of successful use of visual distress signals.

What if you see a Visual Distress Signal given off by another vessel?

The unwritten law of the sea requires that a mariner come to the aid of a mariner in distress. Therefore, should you see a distress signal, immediate and positive action should be taken. Notify the nearest Coast Guard station or State authority by radio. Channel 9 on CB and Channel 16 on VHF marine radio (156.8 MHz) are recognized distress channels. If you can assist the stricken vessel without endangering yourself, you should. The Federal Boat Safety Act of 1971 contains a "Good Samaritan" clause stating: "Any personwho gratuitously and in good faith renders assistance at the scene of a vessel collision, accident, or other casualty without objection of any person assisted, shall not be held liable for any act or omission in providing or arranging salvage, towage, medical treatment, or other assistance where the assisting person acts as an ordinary, reasonably prudent man or woman would have acted under the same or similar circumstances."

Flags

Flags serve a variety of purposes in the marine environment. There is no legislation governing the flying of any flag on numbered, undocumented or licensed vessels. However, there is a proper etiquette involved when displaying flags.



Recreational boaters may fly flags to display boating affiliations. For example, many yacht clubs provide triangular shaped burgees to members. And, members of the U.S. Power Squadrons and U.S. Coast Guard Auxiliary fly flags to identify themselves. Boaters also fly flags to identify their home state or nationality.

Flags are also used for specific boating activities and navigational purposes. For example, boats with scuba divers must fly a "diver down" flag when divers are in the water. There are two types of diver down flags and both are appropriate to display. They are a red flag with a white diagonal stripe and a rigid replica of an "alfa" flag.



Another example is the flags used by committee members and participants of events sponsored by the United States Yacht Racing Union.



Flags are also used to signal your need for help. When in distress, a boat should fly an orange flag with a black square and black ball. A man overboard flag, consisting of the letter "O", can be fixed to a staff which is in turn fixed to a life ring.

ALFA

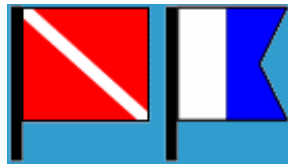


DIVER DOWN

BRAVO
DANGEROUS
CARGO



CHARLIE
YEST



DELTA

KEEP CLEAR



ECHO
ALTERING
TO

STARBOARD



FOXTROT
DISABLED



GOLF



WANT A PILOT



HOTEL
PILOT ON BOARD

INDIA
ALTERING TO PORT



JULIETTE
KEEP CLEAR



KILO
DESIRE TO COMMUNICATE



LIMA
STOP INSTANTLY



MIKE
I AM STOPPED

NOVEMBER



OSCAR
MAN



PAPA
ABOUT TO
SAIL



ROMEO



SIERRA
ENGINE GOING ASTERN



TANGO

KEEP CLEAR OF ME

UNIFORM



VICTOR
REQUIRE ASSISTANCE



WHISKEY
NEED MEDICAL ASSISTANCE



XRAY
YANKEE
DRAGGING ANCHOR

ZULU
REQUIRE TUG



For further reading on these topics and other boating information,
The BOAT/U.S. Foundation recommends any of the following:
All of these can be found through your local BOAT/U.S. Marine

Center, the
BoatU.S. Catalog or the New Online Store! (www.boatus.com)

Chapman's Piloting by: Elbert S. Maloney

Chapman's Hands-On Powerboating CD ROM

The Annapolis Book of Seamanship by: John Rousmaniere

US Power Squadron Booklets (Knots, Sailing, GPS, Radar,
etc.)



US Coast Guard Auxiliary's Skipper's Safe Boating Course