Seefunkschule Adlmanninger

RYA TRAINING CENTRE

Course notes for SRC Radio Students

Please read before the course! Make sure, you understand Basic Radio Language!

The standard method of communicating between vessels and between ship and shore, over distances up to about 40nm is by marine VHF radio. The actual distance over which communication is possible is limited to line of sight which in turn is primarily determined by the height of each party´s aerial. Shore stations and tall vessels can have much greater range than a pair of small launches for example.

It is a legal requirement for any VHF marine radio to be operated under the control of a person holding the appropriate operator´s licence. Older style VHF radios can be operated by holders of the VHF restricted Operators licence, but newer sets which offer Digital Selective Calling (DSC) require the holding of a Short Range Certificate (SRC).

Requirements to get the VHF station on board your boat set up and ready

There are three different requirements to set up and run a ship radio station based on different sets of legal regulations:

1. Of course, a **radio and an antenna**. The equipment must be built to a type approval standard in the EU: so check that the VHF-radio is type approved in the EU. Check for the CE or SOAS wheel mark on the radio or in the manual.

2. In the EU only for such radios you can obtain a ships radio license: either a Ship Radio license or a Transportable Radio License (There are no Transportable Radio Licenses in Austria). In this **document from your national** governmental agency, **you also get the CALL SIGN and MMSI for your ship and the right to use it.**

   In Austria: *Bewilligungsurkunde, ausgestellt für das Schiff vom zuständigen Fernmeldebüro und beinhaltet Rufzeichen und MMSI*

   In Germany: *Frequenzzuteilungsurkunde, ausgestellt für das Schiff von der Bundesnetzagentur in Hamburg*

3. It must be operated only under the control of a holder of the appropriate **Certificate of Competence**. (SRC for a VHF. That's why you attend the course with us.)

The VHF international maritime mobile band

The frequencies used are paired together to channels

So you must not bother much about what frequencies are behind the channels. But make sure you stick to the INT setting in Europe (CAN and US also available providing some national WX channels and different simplex/duplex pairings and dedicated use).

VHF frequencies between 156.00 MHz and 174.00 MHz are allocated for use by ships. There are 59 channels with a spacing of 25 kHz between each.

Simplex and Duplex channels

We have single frequency channels, like Ch 16, which has a frequency of 156.8 MHz, or Ch 72 with 156.625 MHz. These are called Simplex channels, and you can either transmit or receive, but not both simultaneously.

And there are Duplex channels, e.g. Ch 60 or 80. These channels are only for communication between a ship and the coast station.

On Ch 60 for example, the ship transmits on 156.025 MHz and receives on 160.625 MHz. The coast station transmits on 160.625 and receives on 156.025 MHZ, thus you could speak (transmit) and listen (receive) at the same time, like when using a telephone, but only if you communicate with a coast station and your radio is a Duplex radio, which means it has two antennas or a special device. It is very unlikely on a yacht to have such a station. In most cases yachts are fitted with Simplex radios, and then even with a coast station on a Duplex channel, you must press the transmit button to send, and loose it to receive. Important is to know, that you can communicate with another ship station only on a Simplex channel, e.g.
Ch 72, 77, 08, 06.

Each channel is allocated for one or more specific purposes.

Channel 16 is the international VHF Distress Safety and Calling channel. The normal procedure is to call another ship station on Ch 16 and suggest immediately a working channel for communication, like Ch 72. In busy areas there would be a great pressure on Ch 16, and Rescue Centres fear that a distress call may be missed due to congestion.

The introduction of the Digital Selective Calling system (DSC), discussed in our course later, reduces congestion on Ch 16, as the initial call is sent digitally (not voice transmission) on a special dedicated channel: **Ch 70. This channel must never be used for voice transmission**.

Channel 13 is the bridge-to-bridge channel used by big ships on matters of navigational safety, so it is useful for yachts to listen to that channel in Traffic separation schemes (Verkehrstrennungsgebieten) or narrow channels.

Port operation channels are most commonly Ch 11, 12 and 14, but you should refer to a nautical almanac for local differences: in Germany the “Yachtfunkdienst” is available for North and Baltic Sea, in the UK it is the “Admiralty list of radio signals”.

All Marinas in the UK listen on the duplex channel 80, ACY Marinas in Croatia on Ch 17. In the UK Ch 67 is the so called small craft safety channel: it is used by Her Majesty's Coast Guard for receiving Passage reports from yachts.

What is GMDSS?

Former a problem with the safety of ships was, that a Distress call was never made, because there was no time to transmit, or it was never received. And before GMDSS ships communication systems had to be equipped by size and number of passengers. So, a ferry between Dover and Calais had to be equipped with long range com equipment though it never made a trip over that small distance. But it was a huge boat and carried many passengers. A small bulk tramp carrier cruising from Europe to the Indic destinations with almost no passengers had to have only limited com equipment.
To improve the situation, the International Maritime Organization (IMO) introduced the Global Maritime Distress and Safety System (GMDSS). Now it is relevant where the ship will go Sea Area A1-A4) irrespective of size and passengers for SOLAS vessels.

The main feature of the GMDSS is the Digital Selective Calling (DSC) Controller; it is coupled to the normal VHF Radio, and it enables Ship stations to transmit a Distress Alert by pushing a Distress button. If connected to a GPS Receiver, it will transmit automatically the correct position, the identity and if also entered the nature of distress, information which, once received, cannot be deleted, and is used for Rescue Operations. The whole process takes not more than 15 seconds.

GMDSS regulations are now compulsory for all commercial vessels over 300 grt, registered fishing vessels and craft carrying more than 12 passengers. These vessels are called “compulsory fit vessels”. Some smaller commercial vessels such as training sailing yachts are strongly advised to fit VHF DSC.

Compulsory fit craft must have, commercial yachts for passages out of coastal regions should have also:

- VHF DSC Radio (in Area A2 or A3 also MF/HF DSC Radios)
- 406 MHz Emergency Position Indicating Radio Beacons (EPIRB)
- Search and Rescue Transponder
- Radar
- Navtex
- Waterproof handheld VHF Radio

GMDSS Areas:

- A1 within range of a VHF coast station fitted with DSC (30 – 50 Miles)
- A2 within range of a MF coast station fitted with DSC (100 – 300 Miles)
- A3 coverage area of the geostationary Inmarsat satellites (70° N to 70° S)
- A4 the remaining areas using HF DSC

DSC

Every ship station has a Maritime mobile service identity (MMSI) number: a 9 digit number that identifies a particular ship or coast station. Each MMSI contains the country code, in Austria 203, in Germany 211 or 218, in the UK 232, 233, 234 or 235.

The MMSI of a Coast station always starts with 00.
So, the Solent Coast guard has got the MMSI 002320011, and German BREMEN Rescue has 002111240 and in Denmark Lyngby Radio has 002191000.

The MMSI and a second unique identity of a ship station, the CALL SIGN, is issued by a governmental agency:

- In UK it is the OFCOM.

- *In Austria it is the FERNMELDEBÜRO*
- In Germany it is the BUNDESNETZAGENTUR in Hamburg.

With an DSC Controller it is possible to call a ship station individually by entering her MMSI to the system, together with the working channel, on which communication should take place: the digital signal is transmitted on Ch 70, the called station will sound an audible signal, and she will acknowledge the call back digitally on Ch 70 and then the two stations can communicate by voice on the suggested working channel (e.g. Ch 72).

NAVTEX

Is a component of the GMDSS that displays warnings, such as Navigational Warnings and Weather warnings. In some countries you can receive also weather forecasts. It uses the MF frequency 518 kHz, reception is automatic and signals can be received up to 300 miles from the transmitter.

EPIRB

The EPIRB is portable, battery operated, buoyant and waterproof. It transmits a Distress Alert and allows MRCC (Maritime Rescue coordination centres) to pinpoint the position of survivors. Since December 31, 2006 there is only one system left:

406 MHz EPIRB. It can have an integrated GPS, and this is the best system. When the beacon is activated in an emergency this positional information is incorporated into the the distress message it transmits. Thus, the position can be fixed to within 25 metres, a great improvement in accuracy.

SART Search and Rescue Transponder

SART is a small battery-operated beacon based on radar or the newer AIS-SARTs

1) that either (radar) produces a distinctive echo on any 3 cm radar display.

Activated in a small life raft a lifeboat will pick up a contact about five miles away and an aircraft flying 3000 feet up to 30 miles. It is used as a homing aid by the SAR organizations and not as an initial alert (like the EPIRB). It is complementary to an EPIRB.

2) Since 2010 there are also AIS-SARTs available and accepted by the IMO.
They send position and identity as a Datagram over AIS channels and are presented on AIS capable plotters connected to the AIS receiver. These are the more liked tools by yachtsman. As they are also available for PLB on AIS technology for personal rescue on land and sea (but not yet accepted by IMO under SOLAS (as they are no ships), but they seem to work fine). On older AIS systems they appeared with their MMSI starting with 972…

If a SART or an EPIRB is switched on by accident you must switch it off and inform immediately the coast guard stating the MMSI or HEX-Adress, to avoid unnecessary search.

Routine traffic, two yachts, no DSC-Controller:

Yacht „Avalon“ calls yacht „Pearl Island”: Ch 16, SQUELCH, LOW POWER (1 Watt):

Avalon

Pearl Island, Pearl Island. This is Avalon, Avalon, Channel 72 please.

Pearl Island. This is Avalon. Please tell us your ETA in the Cowes Marina.

OVER”

„ Pearl Island. This is Avalon. All received, thank you.

OUT“

Pearl Island

„ Avalon. This is Pearl Island. Received, Channel 72.”

„ Avalon. This is Pearl Island. ETA is about 1300 BST (British standard time).

OVER”

SAFETY

Safety means we have observed a danger for all ships e.g. drifting container, trees, icebergs, buoys off station, lighthouse not working, pirates, … and we want to transmit a warning to all ships. Procedure word (pro word) for a safety message is **"SECURITE"** (spoken: seküritee).

Coast stations announce their Weather Warnings on Ch 16 always with:

> *"SECURITE, SECURITE, SECURITE, all stations, all stations ,all stations.*
>
> *This is Solent Coastguard. For an important weather warning listen Ch 25, 82 , … OVER"*

URGENCY

Urgency means a danger for a ship or a person, but not live threatening, e.g. ship is not under command, but not in a gale or drifting to a rocky lee shore, injured person, but not life threatening etc. Pro word for urgency is **"PAN PAN"** (which comes from the French word 'panique', like MAYDAY originally means: 'que vous màidez').

MY Nogo has an engine failure and is drifting towards the Traffic Separation Scheme (TSS). She transmits an URGENCY Alert on Ch 70, but this only alerts receiving stations (no position info in the alert like in the Distress Alert. Then she transmits by voice on Ch 16:

> *"PAN PAN, PAN PAN, PAN PAN, all stations, all stations, all stations. This is yacht Nogo, Nogo, Nogo, OEX1234, MMSI 203001234.*
>
> *Position 2 miles s of Rijeka harbour.*
>
> *Engine broken down, drifting towards the TSS. Require tug assistance.*
>
> *OVER"*

DISTRESS

Distress means ***grave and imminent Danger to a Person, Ship, Aircraft or Other Vehicle requireing immediate assistance***: Sinking, Grounding in rough sea, Drifting towards a rocky lee shore, Person over board, Fire, Capsizing, Piracy, Collision, Person with a heart attack, typical example is also a seriously injured person (boom hit the head and she is unconscious and bleeding from the ears).

Yacht "Sanola" MMSI 203001234 is on fire, they cannot extinguish the fire, three persons on board, abandoning to life raft.

1. Transmit the DSC Alert on Ch 70 by pushing the "DISTRESS" button for 5 seconds. This transmission will result in a strong audible alert on all VHF radios in a range of 20 - 40 miles (depending on the height of the aerials), and contains the identity and position and, if entered, also the nature of distress.

   This transmission will be sent automatically every 4 minutes, until it is acknowledged on Ch 70 by a Coast station or a ship. Yachts in vicinity of the ship in distress, should never acknowledge a received distress alert: the station acknowledging, takes the responsibility for the rescue operation, and yachts are not professional rescue units.

2. Transmit by voice on Ch 16 the distress call and message. **Very important is the order in the message:**

   - **position,**
   - **nature of distress,**
   - **assistance required,**
   - **number of persons on board**
   - **additional informations.**

   Please make sure, that You learn the correct order now!

Once more, as aggregation:

After the DSC Alert on Ch 70 Sanola transmits by voice on Ch 16:

"MAYDAY, MAYDAY, MAYDAY.

This is yacht Sanola, Sanola, Sanola, Callsign OEX1234, MMSI 203001234.

**)*

MAYDAY, Sanola, OEX1234, MMSI 203001234.

My Position is: 44 degrees 57 minutes N, 015 degrees 08 minutes E. Ship is on fire, cannot extinguish the fire.

Require immediate assistance.

Three persons on board, abandoning to life raft. OVER"

*) Make a short break in your transmission, to give every operator receiving the message, the opportunity to prepare for writing down the message, then start again with MAYDAY, to let everybody know, it is a DISTRESS situation.

Rijeka Radio received the Alert and the Call message. They will acknowledge immediately on Ch 70, and thus the 4 minute auto repetition is stopped. Then they will transmit by voice on Ch 16:

> *"MAYDAY, yacht Sanola, Sanola, Sanola.*
>
> *This is Rijeka Radio, Rijeka Radio, Rijeka Radio. Received MAYDAY, lifeboat launching in ten minutes. OVER"*

The yacht "Avalon", *OEX4321,* MMSI 203004321 is close to the distress position, and can give assistance soon. She offers assistance transmitting by voice on Ch 16:

> *"MAYDAY, Sanola, Sanola, Sanola. This is yacht Avalon, Avalon, Avalon. Received MAYDAY*
>
> *We are two miles south-east of your position. ETA in 20 minutes. OVER"*

The yacht "Avalon" should also inform the Coast Guard about the assistance she offered to Sanola; the transmission starts with "MAYDAY Sanola", to let everybody know, that it is about the distress of Sanola:

> *"MAYDAY, Sanola. Rijeka Radio, Rijeka Radio, Rijeka Radio. This is Avalon, Avalon, Avalon.*
>
> *We are two miles south-east of ship in distress. ETA in 20 minutes. OVER"*

If the yacht "Avalon" is too far away to assist, and **no acknowledge was received from the Coast Guard, then transmit an "All ships urgency alert" on Ch 70.** And, after that, by voice on Ch 16 transmit a MAYDAY RELAY, but make sure that the CG really did not acknowledge the distress alert, which is very unlikely in the coastal area.

(Otherwise you would only disturb the distress traffic):

> *"MAYDAY RELAY, MAYDAY RELAY, MAYDAY RELAY.*
>
> ***All stations, all stations, all stations.***
>
> *This is yacht Avalon, Avalon, Avalon, OEX4321, MMSI 203004321. MAYDAY Sanola, OEX1234, MMSI 203001234*
>
> *My Position is: 44 degrees 57 minutes N, 015 degrees 08 minutes E. Ship is on fire, cannot extinguish the fire.*
>
> *Require immediate assistance.*
>
> *Three persons on board, abandoning to life raft. OVER"*

During the Distress traffic all stations should keep absolute radio silence and transmit only in connection with the rescue operation.

If the yacht “Plaudertaschel” transmits during the distress traffic a routine call on Ch 16, she is asked to cease her transmission immediately by the Coast Guard with the pro word **“SILENCE MAYDAY”** (Spoken: Seelonce mayday).

If the radio silence is finished, because the rescue operation is finished, the Coast Guard will announce it with the pro word **“SILENCE FINI”**.

Best wishes for the SRC course and exam with us!

The trainers, Assessors and the
Principal

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