

VHF SHORT RANGE CERTIFICATE COURSE



1

AIMS and OBJECTIVES

By the end of today you will be able to:

- Understand the Radio Rules and Regs
- Operate Marine VHF DSC equipment
- Call using the correct channel
- Understand basic radio language
- Use the Phonetic Alphabet

2

AIMS and OBJECTIVES

- Make calls to other stations
- Send a **Distress Alert** and **Distress Message**
- Learn about the Global Maritime Distress & Safety System
- Send an **Urgency Alert** and a **Safety Call**
- Prepare for the SRC Assessment

3

there are many different manufacturers



4

HAND HELD VHF RADIOS

NO DSC

- simple
- submersible
- with flashlight
- not expensive



Maximum power = 5W

WITH DSC & GPS

- Waypoint navigation
- (distress position)
- AIS
- MMSI Number
- expensive



Maximum power = 6W

5

VHF RADIO

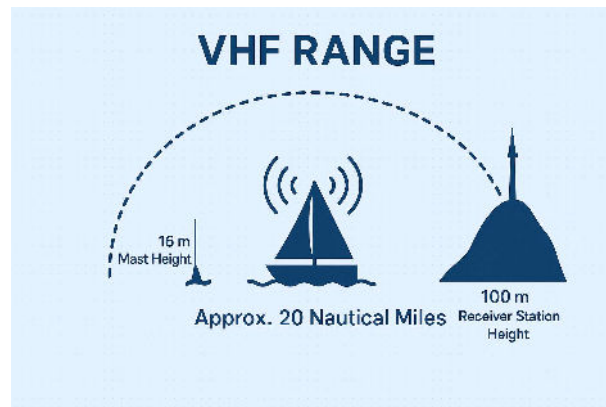
VERY HIGH FREQUENCY radio waves travel in straight lines & don't bend round the earth's surface or penetrate land masses.

Antennas have to be able to see each other
– the higher the antenna the greater the range



6

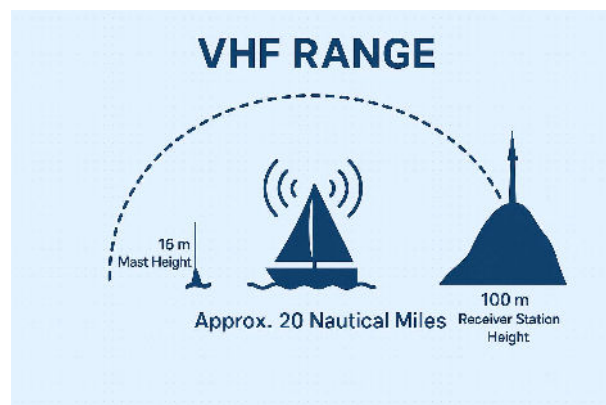
HOW FAR AWAY CAN THEY BE?



$$\text{Max } 2,08 \times (\sqrt{\text{antenna 1}} + \sqrt{\text{antenna 2}})$$

7

HOW FAR AWAY CAN THEY BE?



$$\text{Max } 2,08 \times (\sqrt{16\text{m}} + \sqrt{100\text{m}}) = 29,12\text{sm}$$

8

TYPICAL RANGES of Powerboats



$$\text{Max } 2,08 \times (\sqrt{1,5\text{m}} + \sqrt{4\text{m}}) = 6,7\text{sm}$$

9

Radio Regulations

What you say can be heard by everyone tuned to the channel you are using



Many are waiting to speak on the few usable intership channels

10

Radio Regulations

- never transmit without the skipper's consent
- never send false or misleading emergency or security messages
- never send without identification
- do not turn off your radio in an emergency situation that could affect you
- Never forward messages to everyone except in case of emergency notifications

11

Radio Regulations

- never transmit music via radio
- do not make unnecessary transmissions
- do not transmit using profane, immoral or obscene language
- do not use radio frequencies that are not approved
- do not send any messages that are to be received by land, except to licensed coastal radio stations

12

CERTIFICATION & LICENSING

If you use a VHF radio on board a boat you will be expected to have the following items on board:



SHIP RADIO LICENSE
(for fixed radios) and/or
SHIP PORTABLE LICENSE

CERTIFICATE of COMPETENCE
& AUTHORITY TO OPERATE



13

THE SHORT RANGE CERTIFICATE OF COMPETENCE AND AUTHORITY TO OPERATE



The Driving License

For those **not operating** under SOLAS rules; i.e. leisure boaters over the **age of 16**, using a **Class D set**, portable or fixed.

The SRC is valid for life !

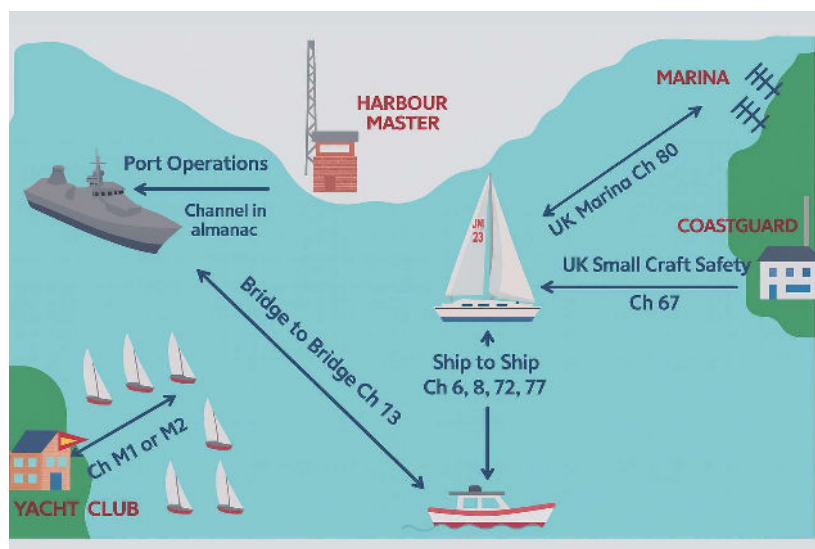
14

WHO MIGHT WE TALK TO?

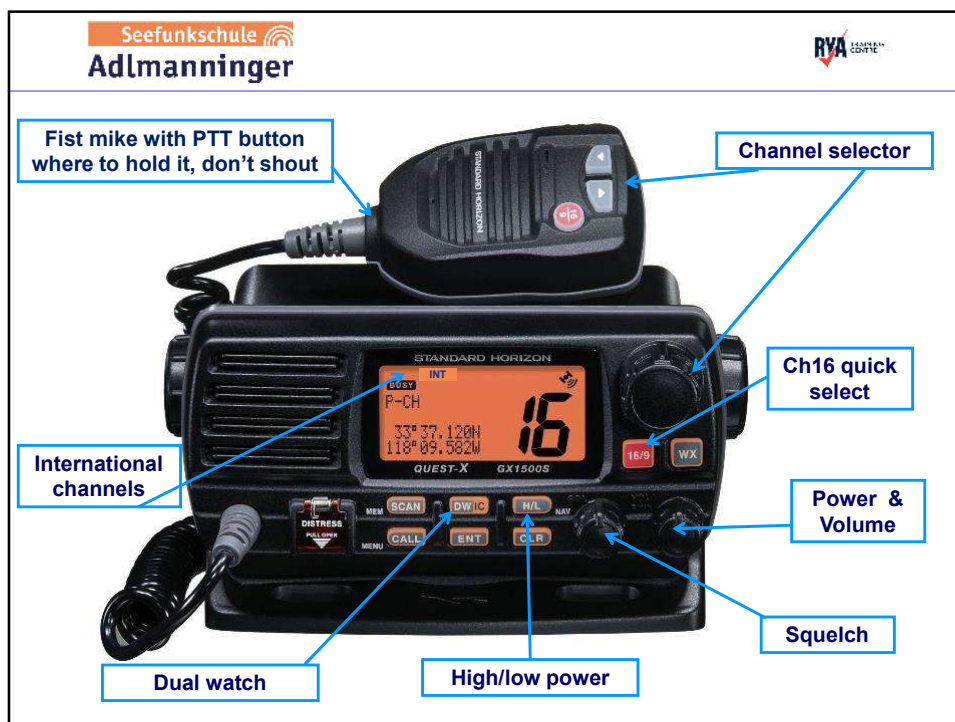


15

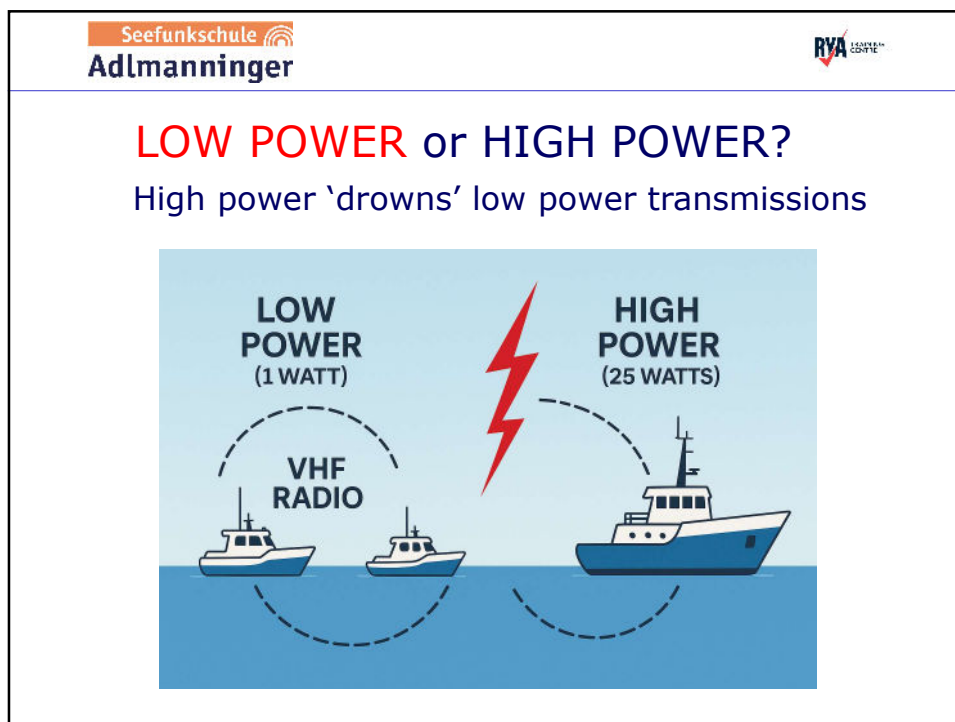
WHICH CHANNELS MAY WE USE?



16



17



18

SIMPLEX & DUPLEX CHANNELS

SIMPLEX channels use **1 frequency** & are for:

- | | |
|-----------------------|--------------------|
| 1. Distress | Ch 16 |
| 2. Urgency | Ch 16 |
| 3. Inter-ship | Ch 6, 8, 72, 77 |
| 4. Port Operations | Ch see Pilot books |
| 5. Small craft safety | Ch 67 |
| 6. Bridge to bridge | Ch 13 |
| 7. Yacht clubs | Ch M1, M2 |

19

SIMPLEX & DUPLEX CHANNELS

DUPLEX channels use **2 frequencies** & are for:

1. Routine weather & safety information
2. UK Marinas (Ch 80)
3. Ship to shore telephone calls (Various)

You cannot talk to another boat on a duplex channel
unless you have the correct equipment

20

DUAL (TRIPLE) WATCH

DUAL WATCH is a function to monitor:

- channel 16

AND

- another channel at the same time

TRIPLE WATCH monitors channel 16 and two other channels

21

22

INTERNATIONAL CALL SIGN

On issue of a Ship Licence a boat is given a unique
INTERNATIONAL CALL SIGN

This call sign remains with boat on change of ownership.

Typical UK Ship call sign = **2ATN6**

Typical Austrian Ship call sign = **OEX7022**

23

INTERNATIONAL CALL SIGN

PORTABLES

are registered to a person not the boat

Typical "T" identification = **T132916**

24

MARITIME MOBILE SERVICE IDENTITY (MMSI)

If the boat has a DSC set, a unique 9 digit MMSI number will be issued

THE FIRST THREE FIGURES IDENTIFY NATIONALITY (MID)

UK & OFFSHORE ISLANDS	232, 233, 234, 235
GERMANY	211, 218
CROATIA	238
ITALY	247
SLOVENIA	278
SWITZERLAND	269
AUSTRIA	203

25

TYPES OF MMSI

UK SHIP STATION IDENTITY

2 3 2 X X X X X X

GROUP SHIP STATION IDENTITY

0 2 3 2 X X X X X

COAST STATION IDENTITY

0 0 2 3 2 X X X X

26

WHAT IS DSC?

DIGITAL SELECTIVE CALLING

A perfectly normal radio transceiver fitted with an added digital alerting device and interfaced with a GPS receiver

A Digital Announcement or Alert may be sent to:

- a) All Stations
- b) A Group of Stations
- c) An Individual Ship Station

DSC are transmitted digitally on **channel 70**

27

Types of calls and prowords

Type	Proword	Channel
DISTRESS (alert)	Mayday	16
URGENCY	Panpan	16
SAFETY	Securite	16 + other
ROUTINE	-	16 + other
URGENCY	Mayday Relay	16

28

DSC ROUTINE CALL

1. Select menu – DSC call
2. Select 'Individual', then 'Routine'
3. Input MMSI (or from memory)
4. Choose channel
5. Transmit

The receiver will have to first stop the sound, then press OK 3 times to establish the connection

PS: every radio model has its own specifics!

29

TIME FOR TALKING



30

DSC ROUTINE CALL

ADVANTAGES

- Does not occupy channel 16
- The alarm on the called radio is very loud!
- A 'missed' call remains in the call log

DISADVANTAGES

- You must know the MMSI of the other vessel
- You need to enter the MMSI in the radio

31

DIRECTORY OF MMSIs

PROVIDED ON THE INTERNET AT I.T.U.

f t d in S+ e

MARS BACK TO ITU MAIN

Q Ship Station - Search

Ship Name

Call Sign

Administration

MMSI (Including for craft associated with a parent ship) or handheld VHF DSC identity

Ship (Vessel) Identification Number

Geographical Area

EPIRB Hex Id Code

General Classification

Satellite Number

Submit Query Clear Query

Ship Station List [Please, enter search criteria](#)

Ship Name	Call Sign	MMSI	Administration	Geographical Area	Ship (Vessel) ID Number	Update Date
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www.itu.int/mmsapp/ShipStation/list

32

A.I.S (Automatic Identification System)

Is a collision avoidance system

Gives information on: Vessels, GPS location, name, true heading, MMSI (and Callsign), speed

Uses VHF frequencies

Class B receiver – used on pleasure boats,

- 2 Watt power on VHF
- Transmits every 30 seconds
- Shows vessels in area (up to 20miles depending on transmission)

33

A.I.S (Automatic Identification System)

AIS vs. Radar

AIS Cons:

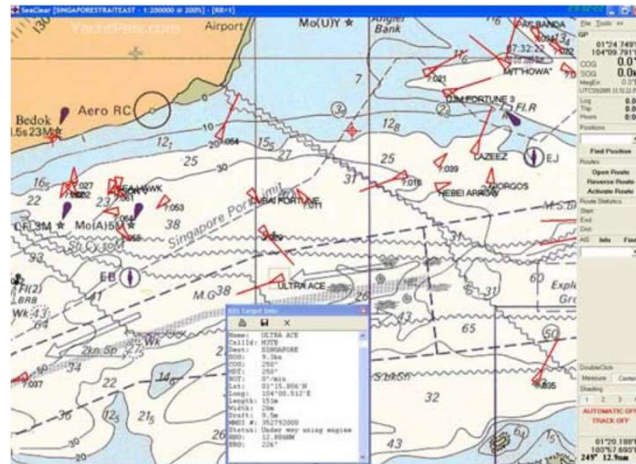
- Doesn't pick up vessels without AIS fitted
- Can't see rocks, obstructions, piers, etc.
- Can't see through fog

AIS Pros:

- Can ID vessels
- Can see round corners
- Cheaper to install than radar
- Less battery consumption

34

A.I.S (Automatic Identification System)



35

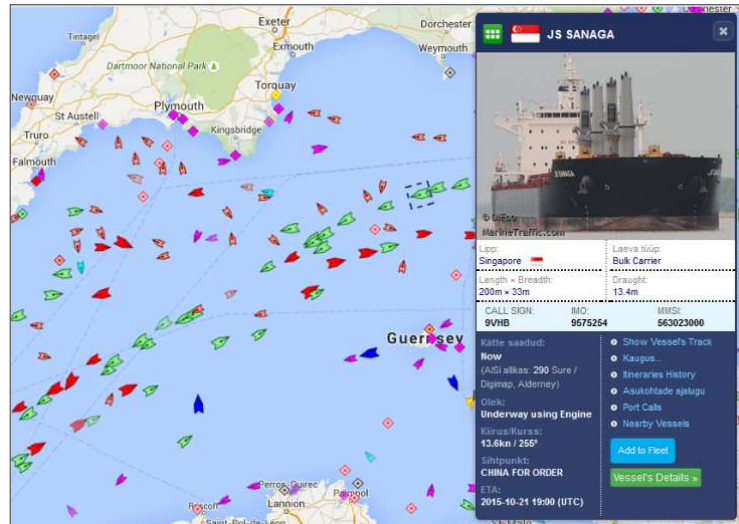
A.I.S (Automatic Identification System)

Live A.I.S. from Marine Traffic 1725 UTC 03/09/2015



36

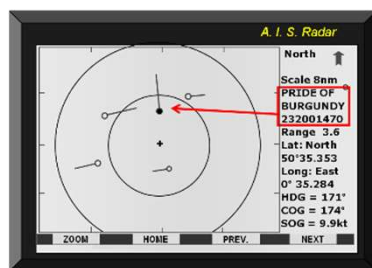
A.I.S (Automatic Identification System)



37

A.I.S. RECEIVERS

NASA AIS "Radar"



Standard Horizon
GX2200E with GPS
and AIS



38

HANDHELD VHF/DSC/GPS



**Has an MMSI
beginning 235 9...(UK)**

This tells a Coastguard that:

- 1. The radio is portable**
- 2. It is fitted with GPS**
- 3. It has limited range**
- 4. It has a short battery life.**

39

40



41

DISTRESS

MAYDAY (from French "M'aider")

Used only when there is:

GRAVE and IMMINENT DANGER

to: PERSON,

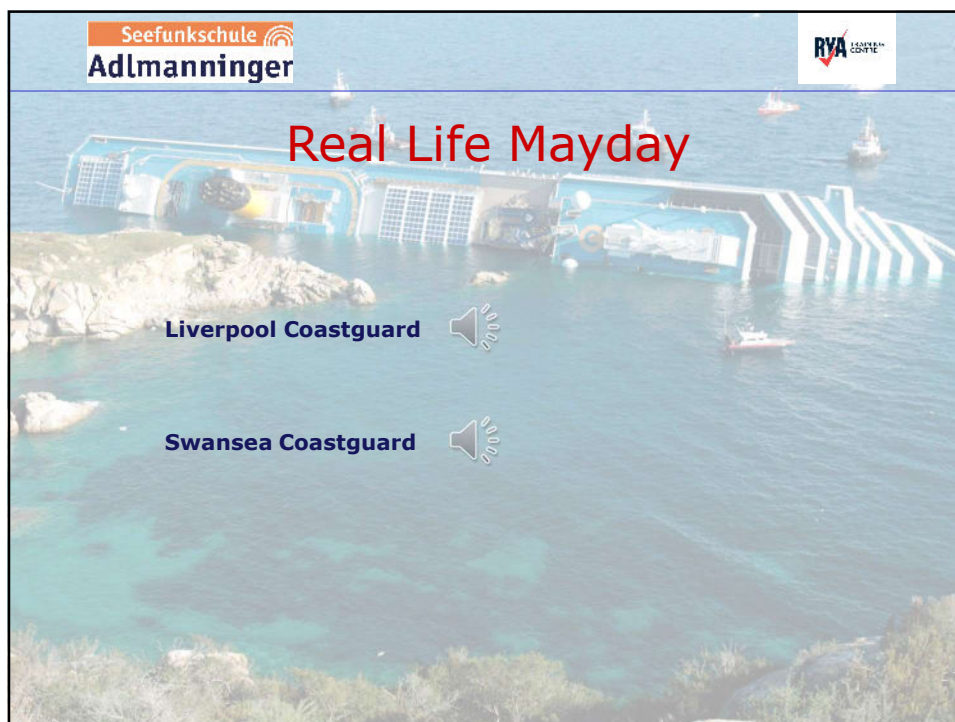
VESSEL

AIRCRAFT or

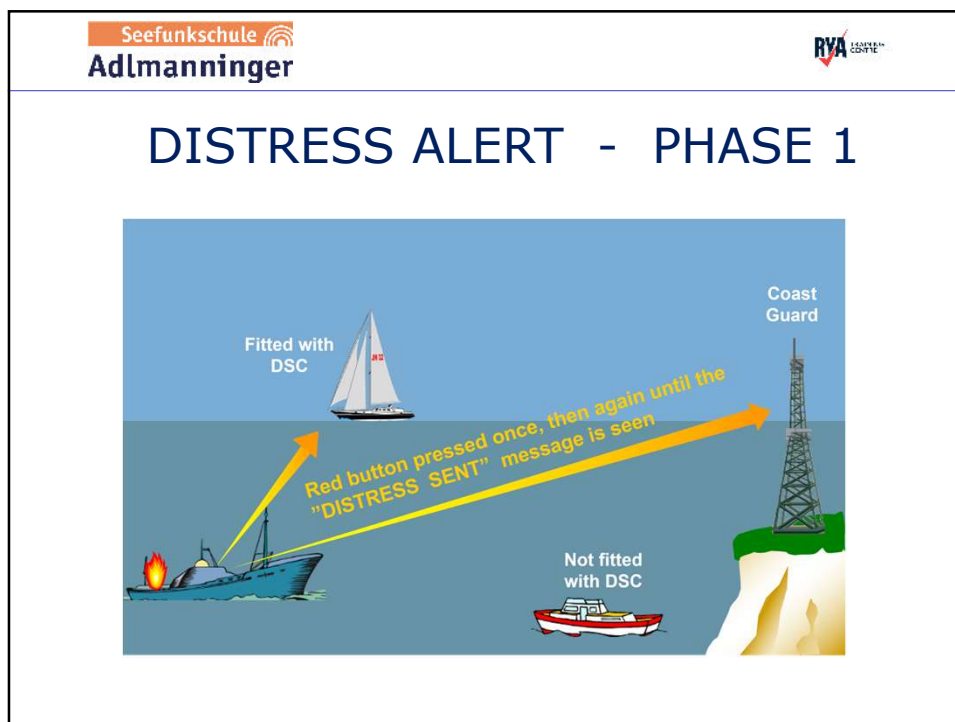
VEHICLE

and **IMMEDIATE ASSISTANCE** is required

42

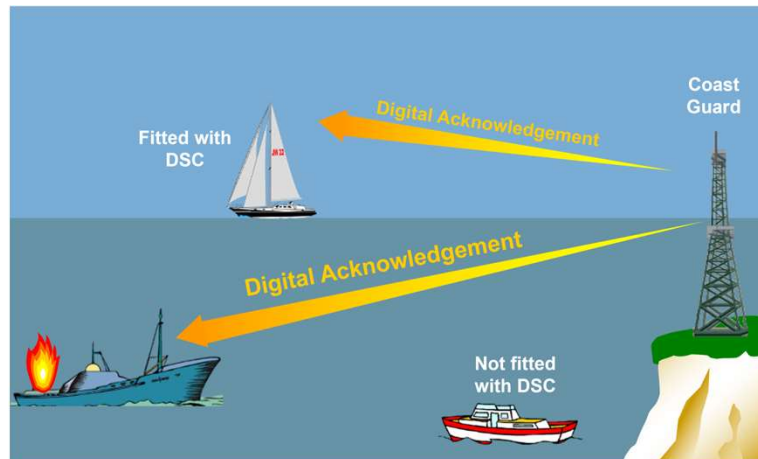


43



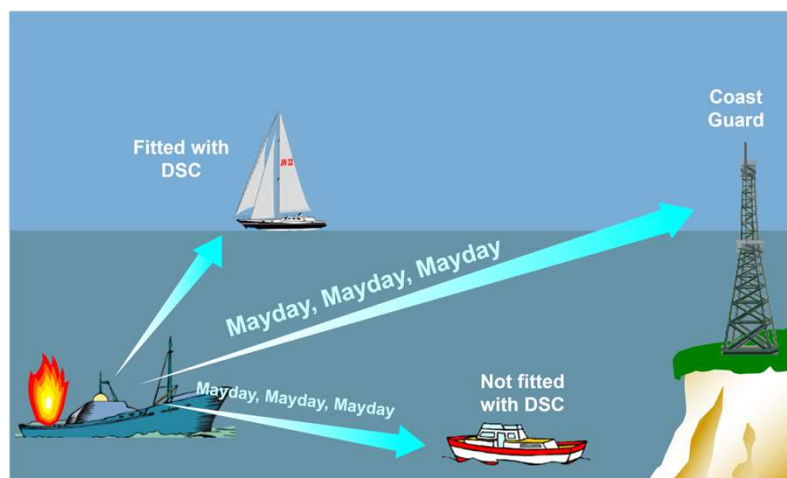
44

DISTRESS ALERT - PHASE 2



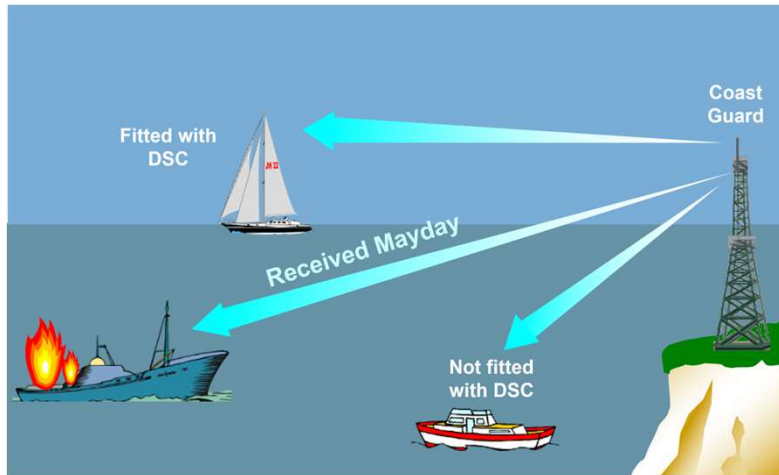
45

DISTRESS ALERT - PHASE 3



46

DISTRESS ALERT - PHASE 4



47

DISTRESS CALL & MESSAGE

M	MAYDAY
I	IDENTIFICATION
P	POSITION
D	DISTRESS
A	ASSISTANCE
N	NUMBER OF PERSONS
I	INFORMATION
O	OVER

48

DISTRESS CALL & MESSAGE

Mayday, Mayday, Mayday

This is M/V Flam, Flam, Flam

Callsign 2CGE4 MMSI 235899982

M Mayday
I Flam 2CGE4 MMSI 235899982
P In position 50°47'.51N 001°17'.29W
(approx 1 mile north of Cowes)
D Fire on board
A I require immediate assistance
N Eight persons on board
I Abandoning to life-raft.
O Over



49

TIME FOR TALKING



50

CANCEL a DISTRESS ALERT

- Switch off the radio to stop retransmitting.
- Make a VOICE call to all stations on CH 16, high power:

All stations, all stations, all stations
This is Broadsword (3 times)
Call sign GMDS9, MMSI 235912345
Cancel my distress alert
I say again
Cancel my distress alert
(sent in error at 1230 LT)
Out

51

52

BASIC CALLING -What to say

- First **WHO YOU ARE CALLING**
(boat name and/or call-sign)
- Second **WHO YOU ARE**
(boat name and/or call-sign)

Call their name **up to a maximum of 3 times** depending on the situation

Generally 1 or 2 times to a shore station or if the other boat has been contacted with a DSC alert

53

TIME FOR TALKING



54

55

GMDSS



Global Maritime Distress and Safety System

Introduced by the International Maritime Organisation (IMO) in the late 1980s to ensure that ships had at least two methods of sending and receiving a distress call.

56



57

GMDSS - Components

- Digital Selective Calling (DSC)
- NAVTEX
- RMSS (INMARSAT & IRIDIUM)
- EPIRBs
- SARTs
- VHF, MF and HF Communications

Various AIS and DSC MOB Beacons
Are commercially available but not part of GMDSS

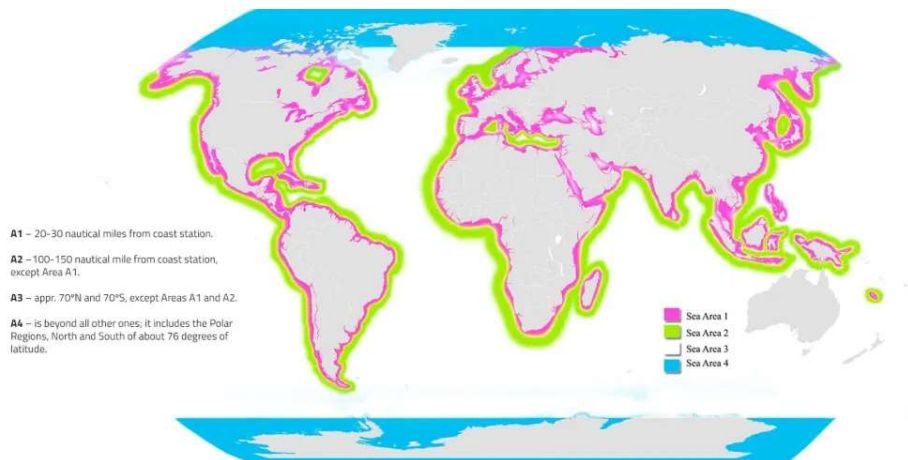
58

GMDSS – Equipment at Sea Areas

Sea Area	Summary	Equipment carried on GMDSS compliant vessels
Sea Area A1	Within VHF range of a coast station (typically about 35 NM)	<ul style="list-style-type: none"> VHF/DSC Handheld VHF EPIRB SART Navtex
Sea Area a2	Within MF range of a shore station (typically 150-180 miles) and excludes A1	<ul style="list-style-type: none"> As above plus MF/DSC
Sea Area A3*	Within coverage of a RMSS (Recognised, Mobile Satellite System).	<ul style="list-style-type: none"> As above plus HF/DSC Inmarsat C and/or Fleet Broadband and/or Iridium GMDSS
Sea Area A4*	Out of range of RMSS.	<ul style="list-style-type: none"> As above

59

GMDSS AREAS



60

406 MHz E.P.I.R.B



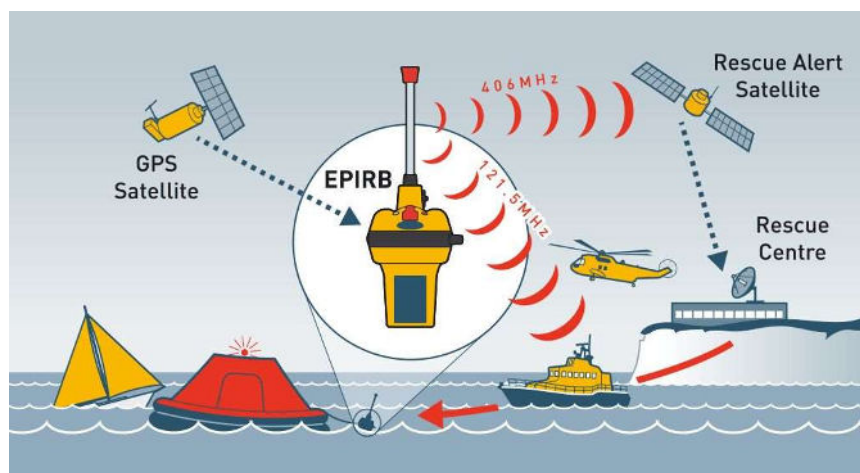
**Emergency
Position
Indicating
Radio
Beacon**



**Uses the COSPAS/SARSAT
military satellites to
pin-point the casualty**

61

406 MHz/ 121.5MHz EPIRB EPIRB



62

E.P.I.R.B - SUMMARY



ALL EPIRBs MUST BE REGISTERED
WITH THE NATIONAL EPIRB
REGISTRY AT THE FLAG STATE

If it is switched on accidentally:
**SWITCH IT OFF AS SOON AS POSSIBLE & CALL THE
NEAREST COASTGUARD**

63

MRCC

Maritime Rescue Coordination Center



64

SART

SEARCH AND RESCUE TRANSPONDER



Responds with its own signal when "interrogated" by a Radar beam

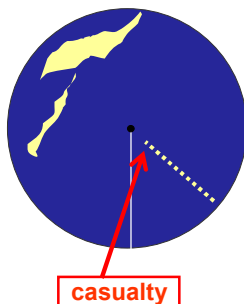


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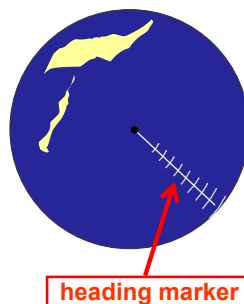
SEARCH AND RESCUE TRANSPONDER

North Up Display

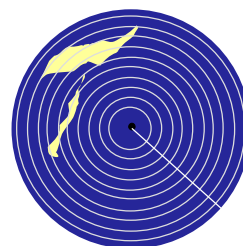
1. Up to 12 dots are displayed on the radar screen



2. As the rescue vessel gets closer the dots change to arcs

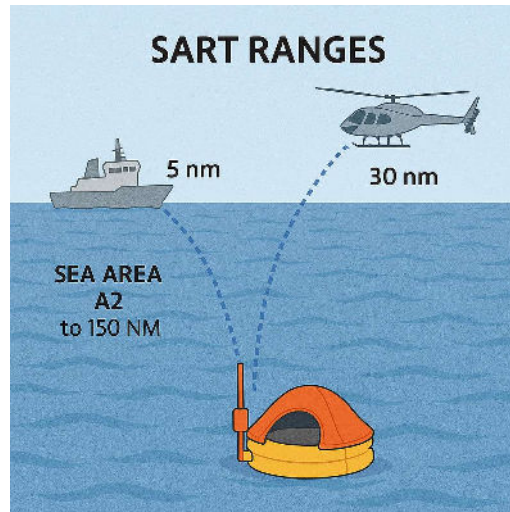


3. Concentric circles are shown when very close to the casualty



66

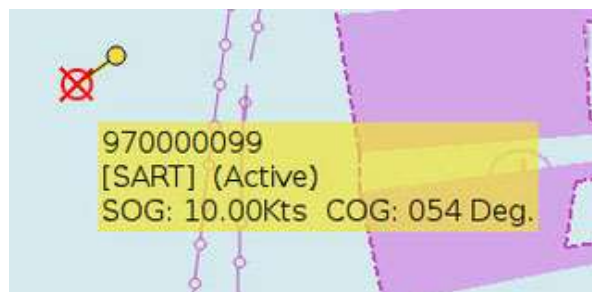
SART RANGES



67

AIS SART

Displays position of casualty on chart plotter



68

Differences between AIS and RADAR SART

Differences	AIS SART	SART
Range	Reception range of AIS / depends on height of antenna	A few nautical miles depending on power and environmental conditions
Battery Life	Continuous operation for 96hrs +	96hrs +
Visibility	See info above	Gives position, I.D. info
Detection	Seen by AIS receivers (vessels and/or shorebased)	Seen by vessels and/or shorebased facilities with Radar
Technology	AIS	Radar
Activation	Manual or Automatic	Manual

69

NAVTEX

Dedicated TEXT equipment which receives

- 1) Weather forecasts & gale warnings
- 2) Navigational warnings
- 3) Details of distress messages

Range approx 300 miles

English language 518 KHz

National language 490 KHz – 2 frequency sets



70

NAVTEX - Message

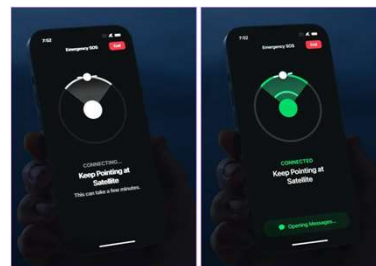
ZCZC QE88
011840 UTC APR
SPLITRADIO SHIPPING FCST FOR ADRIATIC AT 1800 UTC
WNG: POSSIBLE FOG AND VSBY LESS THAN 1 KM ON NORTH AND
ON THE OPEN OF CENTRAL ADRIATIC.
SYNOPSIS: FIELD OF ELEVATED AND LEVULLED AIR PRES OVER ADRIATIC
STATIONARY.
24 HRS OUTLOOK: CALM OR NE, ON THE OPEN NW WINDS 4-8, TOMORROW
W/SW 4-10 KTS. SEA CALM, TOMORROW CALM/SMOOTH. VSBY 10-20, ON
NORTH AND ON THE OPEN OF CENTRAL ADRIATIC LOCALLY REDUCED 1-4
DUE TO MIST, OVERNIGHT AND TOMORROW MORNING POSSIBLE FOG AND
VSBY LESS THAN 1 KM. ON NORTH/PARTLY CENTRAL ADRIATIC MOD CLOUDY,
ON REST PART MOSTLY CLEAR. NO TEMP CHANGES.
NNNN

71

MOBILE PHONES

What you say **CAN'T** be
heard by all

NOT SO GOOD for
DISTRESS



- Limited by range and battery state
- a good backup

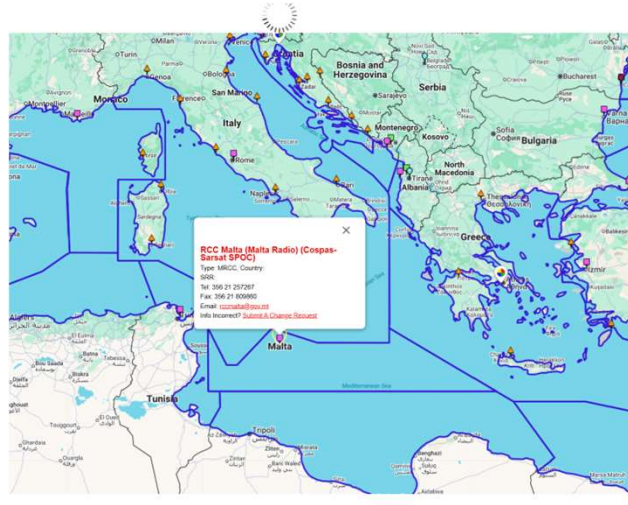
72

SAR Contacts www.sarcontact.info

- Greece: Hellenic Coast Guard Kurzwahl 108 oder 112
- Italy: Emergenza in mare 1530
- Croatia: MRCC Rieška Kurzwahl 195 oder +385 9155
- Slovenia: 080 18 00 (Modra Stevilka)
- Malta: Malta Radio +356 21 456 767

73

SAR Contacts www.sarcontact.info



74

75

URGENCY

PAN PAN

For an urgent message concerning the safety of life or a vessel when immediate assistance is NOT justified

i.e. steering problems & engine trouble



76

URGENCY MESSAGE

Pan-Pan, Pan-Pan, Pan-Pan

All Stations, All Stations, All Stations

This is M/Y Nogo, Nogo, Nogo

Call sign M6CVA MMSI 235899985

Position 3 miles south of Dodman Point

Have engine failure and require a tow

Nine metres in length

Four people on Board

Over



77

URGENT MEDICAL HELP



PAN PAN



CALL ADDRESSED TO NEAREST
COASTGUARD OR '**ALL STATIONS**'
FOR URGENT
MEDICAL ASSISTANCE or **ADVICE**

78

SPOKEN MESSAGE REQUESTING URGENT MEDICAL ADVICE

Pan-Pan, Pan-Pan, Pan-Pan
Thames CG, Thames CG, Thames CG
This is S/Y Dab, Dab, Dab
Call sign M4GHQ MMSI 235899983
My position 51°44'.71N 001°04'.32E
I have an injured crew member and request
urgent medical advice.
Over

79

URGENCY

DISTRESS RELAY



An URGENCY alert is used to
relay a Distress call and
message -> **when the
problem is someone else's !!**

80

DISTRESS RELAY

RELAY IMMEDIATELY

- Person stranded by tide
- Person repeatedly raising and lowering arms
- Vessel suffering a catastrophic explosion
- Aircraft entering the water

RELAY AFTER WAITING 5 MINUTES

- For vessels who have sent a DSC Distress alert but NOT received an acknowledgement from a Ship or Rescue Co-ordination centre

81

RELAY FOR PERSON WITH NO RADIO

Mayday Relay, Mayday Relay, Mayday Relay

All Stations, All Stations, All Stations

This is Spy, Spy, Spy

Call sign 2NJY8 MMSI 235899987

Mayday - stranded person at base of cliff

Approximate position 50°12'.4N 02°15'.7W

Rising tide and partially

Immersed in water

He requires immediate assistance

Over



82

RELAY FOR MAYDAY MESSAGE RECEIVED FOLLOWING DSC DISTRESS ALERT

Mayday Relay, Mayday Relay, Mayday Relay

All Stations, All Stations, All Stations

This is Spy, Spy, Spy

Call sign 2NJY MMSI 235899987

Mayday M/Y Jazz Call sign 2VCX3 MMSI 234000679

His position is 50°12'.4N 002°15'.7W

Holed and sinking

He requires immediate assistance

Three persons on board

They have a life-raft.

Over



83

TIME FOR TALKING



84

SAFETY - SECURITÉ

The DIGITAL Alert is used for:

1. Gale Warnings
2. Strong Wind Warnings
3. Urgent Navigational Warnings

Announcement **ONLY**
on Ch16

MESSAGE broadcast on a
WORKING channel



85

ANNOUNCEMENT FOR A ROUTINE MARITIME SAFETY INFORMATION BROADCAST

All Stations, All Stations, All Stations

This is Solent CG, Solent CG, Solent CG

For my routine Maritime Safety Information
Broadcast for the Solent & Portland areas

Listen Channel 86 for vessels east of the Isle of
Wight and west of The Needles.

Listen Channel 23 for vessels in the Solent.

86

SAFETY

HM COASTGUARD MARITIME SAFETY INFO

A broadcast every **3 hrs** for
12 areas around the UK & NI

New forecast every 6 hrs

Solent & Portland area

0130, 0430, **0730**, 1030,
1330, 1630, **1930**, 2230.

Full information 0730 & 1930
(Navigational warnings,
shipping
& inshore waters forecast)



87

Downloads unter
www.seefunk.net/seminar/

88

Vielen Dank für euer Feedback

