INDEPENDENT COMMUNICATIONS AUTHORITY OF SOUTH AFRICA

RESTRICTED RADIOTELEPHONE OPERATOR'S

EXAMINATION GUIDE (VHF, MF AND HF)

June 2008

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- **ID DOCUMENT/PASSPORT;**
- **PROOF OF PAYMENT'**
- **A PEN**

For any further information, please contact Ms Jackie Le Roux @ ICASA -

Tel: (021) 595-7300
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The fee for this book is R20-00. Please pay at the ICASA Office at the time of ordering.

BACKGROUND

WHY SHOULD I HAVE TO PASS AN EXAMINATION IF I WANT TO OPERATE RADIO EQUIPMENT IN THE MARITIME RADIO BANDS ?.....
HAS MODERN TECHNOLOGY NOT PROGRESSED FAR ENOUGH TO PROVIDE SUFFICIENT ASSISTANCE WHEN I AM IN DISTRESS ?.....

These are just a few of the common questions darted at Radio Examiners on a daily basis. To answer the last question first, yes, modern technology has advanced sufficiently to automatically alert rescue stations of vessels in distress and if you have been operating two-way radio equipment in services other than the maritime environment you **might** be able to utilize maritime radio equipment to call for assistance, ***but***

- lives are still lost at sea;
- large ocean-going vessels still disappear without trace;
- explosions in wheelhouses and engine-rooms destroy communications equipment; and
- vessels in close proximity of one another sink, without the others knowledge, due to language barriers.

In order to reduce the risk of loss of lives at sea, the International Telecommunications Union (ITU) in conjunction with representatives from all the major countries of the world and the International Maritime Organization (IMO) decreed that all communications on the maritime bands should be in a particular format and certain frequencies should be assigned solely to specific communications services. (SOLAS convention). Comprehensive Radio Regulations, covering the entire frequency spectrum, were subsequently drawn up by the ITU and applied on an International basis. One of the requirements of these Regulations is that every government must ensure that persons authorized by it to operate on International frequencies, such as the maritime and aeronautical bands, have a thorough knowledge of and adhere to said Regulations. A Restricted Radiotelephone Operator's certificate may only be issued to persons who have satisfactorily demonstrated their knowledge of the Regulations, particularly those parts relating to safety of life, and their operating ability on maritime equipment. Hence the necessity for an examination as the only practical method of determining a persons knowledge and expertise.

As a means of overcoming the language barrier a few words from the French language were chosen to indicate the nature of assistance/danger that exists. e.g.

DISTRESS THE SPOKEN WORD MAYDAY
URGENCY THE SPOKEN WORDS PAN ····· PAN
SAFETY THE SPOKEN WORD SECURITE, PRONOUNCED SAY-CURE-E-TAY
SILENCE SEELONCE
PARTIAL UPLIFTMENT OF SILENCE PRUDONCE
COMPLETE UPLIFTMENT OF SILENCE SEELONCE FEENEE.

For every category of assistance/hazard, a message in a predetermined format, clearly intelligible to all language groups exists.

In order to understand the importance of sending messages in the correct format, without any additions or deletions, the following example of the distressed yacht NONSUCH/ZSCT, should be studied.

The graphic illustration on the next page represents;
-the yacht Nonsuch enroute from Cape Town to Perth.
-the Dutch Drillship Drillerama ,
-the French OBO carrier Napoleon,
-the Taiwanese fishing vessel Horiki,
-Cape Town Radio, the local Coastal Radio Station, and
-the Cospas Sarsat satellite receiving station above the equator.

The Yacht Nonsuch has struck a submerged object and is sinking rapidly. The Skipper decides that his Yacht and the lives of his crew are in grave and imminent danger and broadcasts the following distress message on 2182 kHz.

"Two-tone alarm for 30 - 60 seconds.
MAYDAY MAYDAY MAYDAY
THIS IS NONSUCH NONSUCH NONSUCH,
MAYDAY NONSUCH/ZSCT
POSITION 43.02 SOUTH, 81.30 EAST,
MY YACHT IS HOLED; I AM TAKING WATER AND SINKING RAPIDLY.
I HAVE FOUR CREWMEMBERS ON BOARD, THE HULL IS WHITE AND THE REST OF THE STRUCTURE IS ORANGE WITH BLUE SAILS.
I REQUIRE IMMEDIATE ASSISTANCE, OVER"

All vessels receiving this message are by law required to acknowledge receipt of the message, after giving Coastal Radio Stations and vessels closer to the vessel in Distress an opportunity to acknowledge receipt first. Thereafter, unless they become actively involved in the Distress operations, they must maintain radio silence until further notice to prevent the possibility of interference to Distress communications. In this case the Yacht Nonsuch is too far from Cape Town Radio and Perth Radio and consequently the message broadcast on 2182kHz was not received by either of the coastal radio stations. Fortunately the Dutch Drillship Drillerama, receives this message and acknowledges as follows.

"MAYDAY YACHT NONSUCH YACHT NONSUCH YACHT NONSUCH
THIS IS DRILLERAMA DRILLERAMA DRILLERAMA,
RECEIVED MAYDAY OVER."

After hearing no other responses, the Master of the Drillerama realizes that his vessel is the only station that received the distress message from the Nonsuch and, because the Drillerama is engaged in drilling operations and too far from the vessel in distress, decides to send the following MAYDAY RELAY message.

"Two-tone alarm for 30 - 60 seconds, whenever possible,
MAYDAY RELAY, MAYDAY RELAY, MAYDAY RELAY
THIS IS DRILLERAMA DRILLERAMA DRILLERAMA,
MAYDAY NONSUCH/ZSCT,
POSITION 43.02 SOUTH, 81.30 EAST,
MY YACHT IS HOLED, I AM TAKING WATER AND SINKING RAPIDLY.
I HAVE FOUR CREWMEMBERS ON BOARD, THE HULL IS WHITE AND THE REST OF THE STRUCTURE IS ORANGE WITH BLUE SAILS. I REQUIRE IMMEDIATE ASSISTANCE, OVER"
(Note that this is the exact message as sent by the Yacht Nonsuch)

The above message is now received by Cape Town Radio, who in turn acknowledges receipt to the Drillerama and, immediately on receipt of the message, re-broadcasts it as follows:-

(Coast Stations are equipped with transmitting equipment that is much more powerful than ships equipment and can therefore reach much further.)

"Two tone alarm for 30 - 60 seconds.
MAYDAY RELAY MAYDAY RELAY MAYDAY RELAY
THIS IS CAPETOWNRADIO CAPETOWNRADIO CAPETOWNRADIO
MAYDAY NONSUCH/ZSCT
POSITION 43.02 SOUTH, 81.30 EAST,
MY YACHT IS HOLED, I AM TAKING WATER AND SINKING RAPIDLY.
I HAVE FOUR CREWMEMBERS ON BOARD, THE HULL IS WHITE AND THE REST OF THE STRUCTURE IS ORANGE WITH BLUE SAILS.

I REQUIRE IMMEDIATE ASSISTANCE, OVER”

All vessels receiving this message will now acknowledge receipt.

The French OBO carrier Napoleon acknowledges as follows:-

“MAYDAY
CAPETOWNRADIO CAPETOWNRADIO CAPETOWNRADIO
THIS IS NAPOLEON NAPOLEON NAPOLEON
ROMEO ROMEO ROMEO MAYDAY, OVER.”

Cape Town Radio will now reply as follows:-

“MAYDAY
NAPOLEON NAPOLEON NAPOLEON THIS IS CAPETOWNRADIO CAPETOWNRADIO
CAPETOWNRADIO ALL RECEIVED, PLEASE STANDBY.”

The Taiwanese fishing vessel **Horiki** also acknowledges receipt of the broadcast made by Cape Town Radio.

“MAYDAY
CAPETOWNRADIO CAPETOWNRADIO CAPETOWNRADIO
THIS IS HORIKI HORIKI HORIKI
ROMEO ROMEO ROMEO MAYDAY, OVER.”

Cape Town Radio will now reply as follows:-

“MAYDAY
HORIKI HORIKI HORIKI THIS IS
CAPETOWNRADIO CAPETOWNRADIO CAPETOWNRADIO
ALL RECEIVED, PLEASE STANDBY.”

The operator at the Coast Station, whilst awaiting more acknowledgments on 2182 kHz, now forwards all the abovementioned information to the nearest Rescue Coordinating Centre (RCC). If no further acknowledgments are received, the Coast Station will contact all the stations that have acknowledged receipt individually. They in-turn will provide their positions, and if they were to proceed to the assistance of the yacht in distress, their eta. Once all the relevant information is obtained, the RCC will determine which vessel is closest to the vessel in distress and instruct the Master by telegram to proceed to the vessel in distress.

The Master of the vessel closest to the Nonsuch, in this case the F/V Horiki, now informs the Skipper of the Yacht Nonsuch that he is proceeding towards his position and what his expected time of arrival would be.

From the time the initial broadcast was made by the Yacht Nonsuch, until it has been determined that assistance is on its way, all other stations have to obey radio silence on the frequency used, in this instance 2182 kHz.

(Stations wishing to contact Coast Stations for telephone calls etc. can, during this period, call on 2191 kHz. The Coast Station will reply on the same frequency.)

If the station in control of the distress, in this case Cape Town Radio as a result of the severely limited communications enjoyed by the Yacht Nonsuch (see section 6 in RADIOTELEPHONE DISTRESS PROCEDURE), feels that sufficient assistance has been obtained and that the vessel in distress can cope until assistance arrives, the operator will make the following broadcast.

“MAYDAY
ALL STATIONS ALL STATIONS ALL STATIONS
THIS IS CAPETOWNRADIO
0900 ZULU YACHT NONSUCH, PRUDONCE.”
(This implies that restricted working may resume on 2182 kHz)

The F/V Horiki now arrives at the scene of the stricken Yacht Nonsuch.
All the survivors are transferred onto the rescue craft and the F/V Horiki now sends the following message.

“MAYDAY
HELLO ALL STATIONS HELLO ALL STATIONS HELLO ALL STATIONS
THIS IS HORIKI
1300Z YACHT NONSUCH, SEELONCE FEENEE. OUT”
(This implies that 2182 kHz is now free for normal communications.)

The abandoned wreckage of the Yacht Nonsuch is a navigational hazard and it is the duty of the last vessel to leave the scene to inform other vessels in the area, as well as the nearest Coastal Radio Station. F/V Horiki now makes the following broadcast.

“SECURITE SECURITE SECURITE
ALL STATIONS ALL STATIONS ALL STATIONS
THIS IS HORIKI HORIKI HORIKI
The abandoned wreckage of the Yacht Nonsuch is drifting in position 43.03 South, 81.46 East. Danger to navigation, all ships please keep a sharp lookout. Out.”

The F/V Horiki contacts Cape Town Radio to ascertain whether this message was in fact received by them. Cape Town Radio will forward this message to the RCC, who will compile a Nav-area message. Nav-area messages are broadcast twice on the 1st, 2nd, 5th, 8th and 12th days after receipt at the Coastal Radio Stations.

COMMENTS

1. If the Yacht Nonsuch was equipped with a 406 MHz EPIRB;
   - the distress alert would have gone direct from the yacht, via the Cospas-Sarsat satellite receiving station to the MRCC and a large amount of valuable time would have been saved.
   - the 121.5 MHz homing facility built into the 406 MHz EPIRB could have assisted any Search and Rescue aircraft despatched to the scene in locating the vessel in distress. The aircraft could then have directed the F/V Horiki straight to the Yacht Nonsuch, thus preventing any further loss of time spent in searching for the yacht. It must be borne in mind that a yacht makes a very small target on even the best of radars and can easily be overlooked, particularly in a rough sea.

2. If the Skipper of the Yacht Nonsuch had realized that;
   - with the limited range that is normally obtained on 2182 kHz during daytime and considering the distance from the nearest Coastal Radio Station, in this case 2182 kHz would not have been the best frequency for sending a distress message. Considering further that if the Drillerama had not been in that position at that time, his distress message would have been unheard, resulting in yet another vessel missing at sea. Had he rather sent his message on 4125 or 8255 kHz, he could have made direct contact with either Cape Town Radio or Perth Radio and all the time that was wasted in relaying distress messages could have been saved.

3. On the plus side, however, the Yacht Nonsuch;
   - was fortunately skippered by a Master who knew his distress procedure, enabling ships of all nationalities to communicate with him, and
   - was not equipped with a VHF installation only, which would have resulted in him not being able to communicate with any other stations at all.

SYLLABUS FOR THE ICASA RESTRICTEDRADIOTELEPHONE OPERATOR'S CERTIFICATE. (MARINE)

1. The holder of a Radiotelephone Operator's Restricted Certificate may carry out the radiotelephone service of any ship station, when working on frequencies of the maritime mobile service, provided that-
   A). the carrier power of the transmitter does not exceed 50 watts; or
   B). the operation of the transmitter requires only the use of simple external switching devices, any manual tuning of the elements determining the frequency is excluded and the stability of the frequencies is maintained within the prescribed tolerance limits by the transmitter itself, the peakenvelope power of which does not exceed 1,5 kW.

2. Candidates are required to demonstrate*:*
   A). A thorough knowledge of radiotelephone operation and procedure;
   B). The ability to transmit and receive correctly by radiotelephone; and
   C). General knowledge of the regulations applying to the exchange of radiotelephone communications and the regulations applying to the safety of life.

3. The examination consists of written and practical tests, which may be supplemented by oral questions.

Candidates are required:-

A). to operate a radiotelephone installation, including changing of frequency;
B). to clear minor external faults on the radiotelephone apparatus;
C). to carry out maintenance of batteries;
D). to send and receive messages by radiotelephone using the prescribed procedures; and
E). to maintain a radiotelephone logbook.

EXAMINATION ARRANGEMENTS
(Please refer to page two of this document as well).

1. Bring two identical black/white or colour photographs. (30 x 40mm)

2. Personal identity or passport document.

3. A printout of the internet payment, if not already provided.

4. When the contents of this brochure are fully understood and all prescribed formats are memorised, contact Ms Jackie Le Roux @ ICASA on Tel: **021-595-1640** to arrange for an appointment to take the examination.

5. Examinations are conducted on Mondays at **12:00 PM SHARP !** at ICASA – Independent Communications Authority of South Africa, 1st Floor, N1 House, 1 Neels Bothma Street, N1 City.

6. Please bring a pen.

IMPORTANT RADIOTELEPHONE FREQUENCIES

1. 2182 kHz is the International Distress, Calling and Answering frequency. It is used for Distress calls and Distress traffic, for signals of EPIRBs, for the Urgency Signal, Urgency Messages and for the Safety Signal (Safety messages shall be transmitted, where practicable, on a working frequency after a preliminary announcement on 2182 kHz). All transmissions in the band between 2173,5 kHz and 2190,5 kHz, except for those authorized for use on the frequency 2182 kHz, are forbidden.

2. 2191kHz is used as a calling frequency by ship stations for calling and answering coast stations when the frequency 2182 kHz is being used for distress purposes.

3. 2356 kHz is used for intership communications and may be supplemented by 2048 kHz, 2263 kHz and 2269 kHz.

4. 3023 kHz is used for intercommunication between mobile stations when they are engaged in search and rescue operations, and for communications between these stations and participating land stations.

5. 4125kHz is used to supplement the frequency 2182 kHz for distress and safety purposes and for general call and reply.

6. 4146 kHz. is used for intership communications and may be supplemented by 4149 kHz.

IMPORTANT VHF MARITIME FREQUENCIES
(ALSO CONSULT THE TABLE OF FREQUENCY ALLOCATIONS, APPENDIX 18).

1. CH16 is the International Distress, safety and calling frequency for radio telephone stations using the VHF marine bands. It is used for the Distress Signal, the Distress call and Distress traffic, as well as for the Urgency signal, Urgency traffic and the Safety Signal. Safety messages shall be transmitted, where practical, on a working frequency after a preliminary announcement on CH16. All communications should be very brief and no conversations are allowed.

2. CH70 is the International Distress, safety and calling frequency using Digital Selective Calling techniques (DSC). No communications other than the aforementioned will be allowed on this frequency.

3. CH06 is the prime intership frequency and is also used for communications between ship stations and aircraft stations during rescue operations.
4. CH12 Used for port operations.

5. CH11 Used for port operations.
6. CH24, CH25, CH26, Ch27, CH28. Used for public correspondence.
7. CH13 is the channel used for Intership Navigational Communications.
8. CH15 and 17 are used for on board communications.

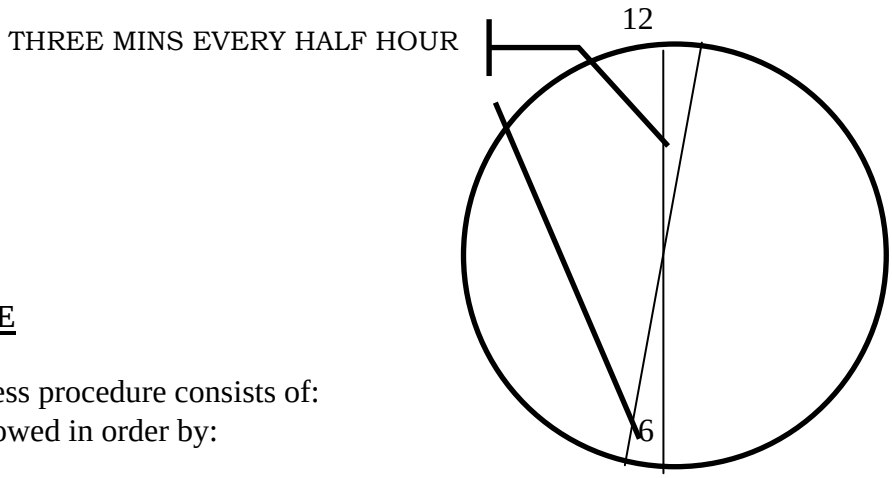
RADIOTELEPHONE DISTRESS PROCEDURE

1. GENERAL

The distress call shall have absolute priority over all other transmissions. All stations which hear it, shall immediately cease any transmission capable of interfering with the distress traffic and shall continue to listen on the frequency on which the distress call was initiated.
This call shall **not** be addressed to a particular station and acknowledgment of receipt shall not be given before the distress message which follows it is sent.

2. SILENCE PERIODS

The silence periods are reserved solely for the transmission of distress, urgency and safety signals and to allow weak distress signals to be heard without any interference. All stations of the maritime mobile service normally keeping watch on 2182 kHz shall during their hours of service observe radio silence for 3 minutes twice each hour beginning a XH00 and XH30.



3. DISTRESS SEQUENCE

The radiotelephone distress procedure consists of:
- The alarm signal, followed in order by:
- The distress call and
- The distress message.

A. ALARM SIGNAL

The radiotelephone alarm signal consists of two audio frequencies of 2200 Hz and 1300 Hz which are alternated to give a warbling sound. This signal should be transmitted for 30 to 60 seconds.
This alarm signal may only be used to announce;
- that a distress call is about to follow, or
- that a relayed distress call/message is about to follow, or
- the transmission by a **coast station** of an urgent cyclone warning, or
- the loss of a person(s) overboard or grave and imminent danger threatening a person(s). In this instance the signal may only be used when the assistance of other ships is required and **can not** be satisfactorily obtained by the use of the urgency signal alone.

B. DISTRESS CALL

The radiotelephone distress call consists of;

- The distress signal **MAYDAY** spoken **3 times**, followed by
- the words **THIS IS** and
- the **NAME, Callsign or MMSI** of the station in distress , spoken **3 times**.

C. **DISTRESS MESSAGE**

The radiotelephone distress message consists of;

- the distress signal **MAYDAY**
- the **NAME, Callsign or MMSI** of the station in distress,
- particulars of it's **POSITION,**
- the **NATURE OF THE DISTRESS** and the **KIND OF ASSISTANCE REQUIRED**,
- and any other information which might facilitate the rescue.

4. **ACKNOWLEDGMENT OF DISTRESS**

Ship stations which receive a distress message from another ship station which, beyond any possible doubt, is in their vicinity, shall immediately acknowledge receipt. However, in areas where reliable communications with one or more coast stations are practicable, ship stations should defer this acknowledgment for a short interval so that a coast station may acknowledge receipt.
Ship stations which receive a distress message from a station which, beyond any possible doubt, is not in their vicinity, shall allow a short interval of time to elapse before acknowledging receipt of the distress message in order to permit stations nearer to the station in distress to acknowledge receipt without interference.

The acknowledgment of receipt of a distress message shall be in the following format:

- The distress signal **MAYDAY**,
- The **NAME, Callsign or MMSI** of the stations sending the distress message, spoken **3 times**.
- the words **THIS IS**
- the **NAME, Callsign or MMSI** of the station acknowledging receipt, spoken **3 times.**
- the words **RECEIVED MAYDAY**. (In cases of language difficulties, the words **ROMEO ROMEO ROMEO MAYDAY**, should be used.)

5. **RELAYING OF DISTRESS**

Any station which learns that a ship station is in distress shall transmit a distress message in any of the following situations: NB !!

a. When the station in distress is itself not in a position to transmit the distress message. (E.g., on fire, radio inoperative or sunk, etc.)

b. When the master or person responsible for a ship, not in distress itself, considers that further help is necessary, or

c. When, although not in a position to render assistance, it has heard a distress message which no-one else has acknowledged.

The relayed distress message shall be in the following format:

- **Alarm signal** for 30 - 60 seconds.
- The words **MAYDAY RELAY**, spoken **3 times**
- The words **THIS IS,**
- The **NAME, Callsign or MMSI** of the transmitting station, spoken **3 times**
- The word **MAYDAY,** followed by the **NAME/CALL SIGN/MMSI** of the station in distress,
- **THEN REPEAT THE DISTRESS MESSAGE EXACTLY AS RECEIVED**

A ship station should not acknowledge receipt of a distress message sent by a coast station until the master, or the person responsible, has confirmed that the ship station concerned is in a position to render assistance.

6. CONTROL OF DISTRESS

Distress traffic consists of all messages relating to the immediate assistance required by the station in distress. In distress traffic the distress signal MAYDAY shall be sent before each and every transmission and at the beginning of the preamble of any radio telegram which may be transmitted in connection with the distress. The control of distress traffic is the responsibility of the station in distress or the station to which the control was handed by the station in distress. Control may be handed over in the event that the station in distress can no longer use its radio installation, either as a result of malfunction of the equipment or abandonment of the vessel. Control may also be assumed by another station, usually the nearest coast station, if it becomes evident that the station in distress is experiencing communication difficulties, e.g., failing batteries. In the example of the Yacht Nonsuch, control was assumed by Cape Town Radio immediately because the yacht was unable to communicate with any station other than the Drillerama.
The station in control of the distress may impose silence either on all stations in the area or any station which interferes with the distress traffic. It shall address such instructions to ALL STATIONS, or to one station only according to circumstances.

The station in control of the distress shall impose silence in the following format

- The words **SEELONCE MAYDAY,**
- the words **THIS IS**, followed by
- the **NAME, Callsign or MMSI** of the station sending the message.

Silence may also be imposed by a station not in control of the distress. This shall be done in the following manner.

- The words **SEELONCE DISTRESS,**
- the words **THIS IS,** followed by
- the **NAME, Callsign or MMSI** of the station sending the message.

Any station which has knowledge of distress traffic and which cannot itself assist the station in distress shall nevertheless follow such traffic until it is evident that assistance has been provided to the vessel in distress.

7. RESUMPTION OF WORKING

When the station in control of the distress is satisfied that the distress situation is under control, the vessel in distress and the rescue craft are in communication with each other and absolute radio silence need no longer be maintained by all stations not directly involved, it may transmit a message indicating that **restricted working** may resume on the frequency that is being used. The message shall be transmitted in the following format.

- The distress signal **MAYDAY,**
- the call **HELLO ALL STATIONS**, spoken **3 times,**
- the words **THIS IS**,
- the **NAME, Callsign or MMSI** of the station sending the message,
- the **TIME** of handing in of the message,
- the **NAME** of the station that **WAS IN DISTRESS**, and`
- the word **PRUDONCE**, out.

N.B. This message does not imply that the distress is over and full silence may be re-imposed at any time should circumstances require it!
When the rescue operation has been completed and distress traffic on that frequency has ceased, the station which controlled the distress shall transmit a message indicating that **normal working** may be resumed

This message shall always be in the following format:
- The distress signal **MAYDAY,**
- the call **HELLO ALL STATIONS**, spoken **3 times**,
- the words **THIS IS**,
- THE **NAME, Callsign or MMSI** of the station sending the message,
- the **TIME** of handing in of the message,
- the **NAME** of the station **WHICH WAS IN DISTRESS**,
- followed by the words **SEELONCE FENEE, OUT**

Although the distress is now over, care should still be taken to avoid interfering with any Urgency or Safety traffic which frequently follows distress operations.

8. EXAMPLES

I. DISTRESS

Two-tone alarm for 30 - 60 seconds.
MAYDAY MAYDAY MAYDAY, THIS IS
NONSUCH, NONSUCH, NONSUCH,
MAYDAY NONSUCH/ZSCT,
POSITION 25 MILES SOUTHWEST OF DASSEN ISLAND, ON FIRE, REQUIRE IMMEDIATE ASSISTANCE, OVER.

(Please note ! The words “Mayday Nonsuch/ZSCT” in the fourth line are absolutely essential, if this line is omitted, nobody will know which station is in distress and if you do not ask for assistance, nobody will assist you.)

II. ACKNOWLEDGMENT

MAYDAY
NONSUCH NONSUCH NONSUCH
THIS IS
HORIKI HORIKI HORIKI
RECEIVED MAYDAY, or
ROMEO ROMEO ROMEO MAYDAY, OVER

III. RELAY OF DISTRESS

Two-tone alarm for 30 - 60 seconds.
MAYDAYRELAY MAYDAYRELAY MAYDAYRELAY
THIS IS
DRILLERAMA DRILLERAMA DRILLERAMA
MAYDAY NONSUCH
POSITION, 25 MILES SOUTHWEST OF DASSEN ISLAND, ON FIRE, REQUIRE IMMEDIATE ASSISTANCE, OVER.

(N.B. When relaying a distress message it is extremely important to use the words "MAYDAY RELAY" so that no confusion may arise over which station is actually in distress.)

IV. IMPOSING SILENCE

The station controlling the distress imposes silence as follows:

SEELONCE MAYDAY THIS IS NONSUCH.

The station not in control of the distress imposes silence as follows:

SEELONCE DISTRESS THIS IS HORIKI.

V. CANCELLATION OF DISTRESS

Restricted working:

MAYDAY
HELLO ALL STATIONS, HELLO ALL STATIONS,
HELLO ALL STATIONS
THIS IS
CAPETOWNRADIO
0900 UTC, NONSUCH/ZSCT,
PRUDONCE, OUT

Normal working.

MAYDAY
HELLO ALL STATIONS, HELLO ALL STATIONS,
HELLO ALL STATIONS
THIS IS
CAPETOWNRADIO
1400 UTC, NONSUCH/ZSCT,
SEELONCE FEENEE, OUT.

(Questions will be asked on all the abovementioned sections and for this portion of the examination an 80% pass mark is required. No additions or deletions will be accepted.)

RADIOTELEPHONE URGENCY

In radiotelephony, the urgency signal consists of the group of words '**PAN PAN**", repeated 3 times before the call. The urgency signal shall only be sent on the authority of the person responsible for the ship and indicates that the calling station has a very urgent message to transmit concerning:

- The safety of a ship, aircraft or other vehicle, or
- the safety of a person.

The urgency signal and message following it shall be sent on 2182 kHz and/or 4125 kHz and CH16, except;

- in the case of a long message or a medical call, or
- in areas of heavy traffic when the message is being repeated.

Under these circumstances, the urgency call will be sent on 2182/4125 kHz and CH16 and the message will be broadcast on working frequencies.

The radiotelephone urgency message shall;

- be addressed to ALL STATIONS or to a particular station,
- be broadcast in plain language,
- have priority over all communications, except distress, and
- be cancelled by the station responsible for its transmission as soon as it learns that action is no longer required. The message of cancellation shall be prefixed by the urgency signal and shall be addressed to all stations.

The urgency signal and message shall take the following form:

- The urgency signal **PAN-PAN**, 3 times
- the words **"HELLO ALL STATIONS",** 3 times
- the words **THIS IS**, followed by
- the **NAME, Callsign or MMSI** of the station transmitting the message, 3 times,
- the **POSITION** of the vessel requiring assistance,
- the **NATURE OF THE URGENCY**, and
- the **KIND OF ASSISTANCE**, required.

Medical advice messages are free of charge, however radiotelephone calls are charged at the normal rate applicable to the frequency band being used. Vessels requesting medical advice on radiotelephony shall either;

- address the message to '**PORTHEALTH**". This message should include details of the patient, the ships position, and ETA at the nearest port; or
- request a telephonic consultation with the Porthealth doctor on duty.
  (If you are expecting a reply from the doctor, please advise the Coastal Radio Station on which frequency you are standing by!); or
- address a PAN PAN message to all stations requesting assistance from vessels with a doctor on board.

RADIOTELEPHONE SAFETY

In radiotelephony the safety signal consists of three repetitions of the word "**SECURITE**". The safety signal indicates that a station is about to transmit a message containing:

- important navigational information; or,
- a meteorological warning.

The safety signal shall be sent on 2182 kHz, 4125 kHz and/or 156.8 MHz (CH16) or any other frequency which may be used for distress urgency and safety and shall have priority over all other communications except distress and urgency. Safety calls and messages shall normally be addressed to "ALL STATIONS" , but in some cases may be addressed to a particular station. With the exception of messages transmitted at fixed times, the safety signal shall be transmitted towards the end of the first

available silence period and the message shall be transmitted immediately after the period of silence. When the transmission is likely to exceed 1 minute in duration, the message should be transmitted on a working frequency after a preliminary announcement on 2182 kHz, 4125 kHz or CH16.

Messages containing information regarding:
- meteorological warnings;
- the presence of cyclones; and
- the presence of dangerous ice, dangerous wrecks or any other imminent danger to marine navigation;

shall be transmitted as soon as possible and shall be repeated at the end of the first period of silence which follows.

The transmission of safety messages shall take the following form:

- The safety signal **SECURITE,** 3 times,
- the words **"HELLO ALL STATIONS"** 3 times
- the words "**THIS IS"**
- the **NAME, CALL SIGN or MMSI** of the station sending the message, 3 times,
- and all the **INFORMATION** regarding the position and nature of the hazard, out.

EXAMPLES OF URGENCY & SAFETY MESSAGES

URGENCY

PAN PAN PAN PAN PAN PAN
HELLO ALL STATIONS HELLO ALL STATIONS HELLO ALL STATIONS,
THIS IS
NONSUCH NONSUCH NONSUCH,
500 METERS OFF HONDEKLIP POINT, M/V NONSUCH DRIFTING ONTO THE ROCKS, REQUIRE IMMEDIATE TOW, OVER.

SAFETY

SECURITE SECURITE SECURITE
HELLO ALL STATIONS HELLO ALL STATIONS HELLO ALL STATIONS,
THIS IS
HORIKI HORIKI HORIKI,
25 MILES SOUTH-WEST OF CAPE POINT, M/V HORIKI SUFFERING ENGINE BREAKDOWN AND UNMANOUVERABLE, DANGER TO NAVIGATION. ALL SHIPS PLEASE KEEP A SHARP LOOKOUT, OUT.

MARINE TERMINOLOGY & MODES OF EMISSION

1. COSPAS SARSAT

   Russian & American "Distress only", satellite. Polar orbiting and responds to 121.5 and 406 MHz EPIRBS.

2. DSC Digital Selective Calling as used in radiotelephony is similar to a Selcall number, used in RTTY. Stations call one another by simply feeding a MMSI number into the equipment.

3. LAND EARTH STATION

   This is the part of the Inmarsat network to and from which communications are routed via the satellite in orbit.

4. INMARSAT

   The controlling body, established on 3rd September 1976 by the Convention on the International Maritime Satellite Organisation, responsible for the operation and coordination of all aspects of maritime communications via satellite.

5. NAVTEX An automated system for the transmission of Distress, Urgency, Navigational and Meteorological warnings and other urgent information to ships using RTTY principles (see below) on a common world-wide frequency of 518 kHz. Coast stations routinely broadcast weather bulletins at fixed times daily and re-broadcast distress and urgency messages on receipt.

6. RTTY Radio teletype. A system of radio communication whereby messages are exchanged between stations using telex machines connected to transmitters/receivers in place of microphones. Stations are identified by unique numbers, called Selcall numbers, in addition to call signs.

7. SATELLITE EPIRB

   A type of EPIRB which operates via the polar orbiting Cospas-Sarsat or Inmarsat satellite networks and which can be programmed to transmit information including the vessel's call sign or MMSI number and position.

8. SART Search And Rescue Transponders are portable units, which are carried into lifeboats when ships are abandoned. These units are normally in a passive mode and will only be activated by a passing ship's radar, producing a visible target on the ship's radar screen.

9. G3E Phase modulated telephony, used on the VHF band.

10. J3E Telephony, single sideband, suppressed carrier. This mode requires a receiver with special circuitry to receive clear signals. It is used on all frequencies in the MF and HF marine bands and may be used on 2182 kHz in certain circumstances **but not when distress working is in progress.**

11. QRC Radio Accounting Authority. It is the person or organization responsible for the payment of radio accounts.

12. MMSI Maritime Mobile Service Identity. A unique 9-digit code number that is allocated to maritime stations for identification purposes of EPIRBS and GMDSS stations. The first three digits indicates the country in which the apparatus is registered. The next six numbers are the unique identification of the ship. Coast Station MMSI numbers are normall preceded by 00. e.g. Cape Town Radio's MMSI is – 006010001.

13. GMDSS Global Maritime Distress and Safety System. A maritime service that uses Digital Selective Calling techniques programmed into specialized apparatus.

14. MRCC Maritime Rescue Co-ordination Centre. Telephone number is 021-9383300.

ALARM SIGNALS

1. RADIOTELEPHONE ALARM SIGNAL

The alarm signal consists of 2 audio frequency tones transmitted alternately. One tone shall have a frequency of 2200 Hz and the other a frequency of 1300 Hz, the duration of each tone being 250 milliseconds(¼ second). The signal shall be sent continuously for a period of at least 30 seconds but not exceeding 1 minute. When transmitted by coast stations it shall be followed by a single tone of 1300 Hz for 10 seconds.

2. PLEASE NOTE

Accidental activation of any alarm signal should be followed by a general call to all stations indicating that the alarm was activated in error. Also inform the Coast Station.

EPIRBS

SATELLITE EPIRB (406 MHz type)

The satellite EPIRB is designed to satisfy the rapid alerting function in catastrophic incidents where there has been no opportunity to pass a distress message by ordinary methods. Although capable of manual activation the satellite EPIRB will float-free from a sinking ship and automatically transmit a distress alert including the MMSI, or other identification, and nationality of the vessel, whether the EPIRB was manually or automatically activated and the position of the incident if it was connected to the vessel's GPS navigation system. If the EPIRB transmits no position information, the satellite will itself determine the position. The distress message, transmitted on 406 MHz, will then be relayed via the orbiting satellite to the nearest Local User Terminal (LUT); the processed signal data will then be forwarded to the Maritime Rescue Coordination Centre (MRCC) closest to the scene of the incident which will immediately begin to coordinate the Search and Rescue (SAR) operation.

Once activated, Satellite EPIRBs also transmit a continuous homing signal on 121,5 Mhz which can be of great assistance to SAR aircraft dispatched to locate survivors. With this in mind, and taking into account the different rates of drift between a small EPIRB and a much larger liferaft or lifeboat, all EPIRBs are provided with a floating tether rope which can be used to retrieve the EPIRB and secure it to a survival craft, thus ensuring that EPIRB and survivors are in the same position when located *The purpose of the rope is for the EPIRB to be attached to the LIFERAFT and is not to be secured to the parent vessel.*

VERY IMPORTANT CHECKS TO PERFORM ON AN EPIRB-

- *Check that the battery is not passed the expiry date.*
- *Check that the hydrostatic release is not passed the expiry date.*
- *Check that the manual is on board.*
- *Read the manual and follow the monthly testing procedure.*

Other variations of EPIRBS that are currently in use:

- 121.5/243 MHz. This type transmits on the aeronautical distress frequency and is monitored by satellite and aircraft stations. Unfortunately the satellites monitoring this frequency do not have storing capabilities and retransmit the received data on receipt. There are few facilities for the reception of such messages in the Southern hemisphere, and none at all presently covering Southern Africa, resulting in the message being lost in space. The 121,5 MHz service will be discontinued in 2009.

SART (SEARCH AND RESCUE RADAR TRANSPONDERS).

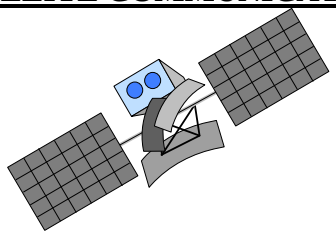
The SART is used to alert vessels in the vicinity of an emergency situation, by radar. This transponder sends a signal to all the 9 GHz radars in the vicinity that enables ships to do radio location. It will show a series of 12 dots, similar to a Racon, in the direction relevant to the ship receiving the signals on his radar. There are many make and models available. Thus, make sure that you have read the handbook. Keep the handbook on board your vessel for easy reference.

NAVTEX RECEIVER.

Checks to perform on the navtex receiver are-

- Check that the paper roll is not completely depleted;
- Check that the audible alarm is not de-activated;
- When the alarm is on, it means that a very urgent message has been received. This could possibly be a distress, urgency or medical situation. **READ THE MESSAGE** and assist if you are in a position to offer assistance.
- Check that it is properly set up to receive all messages in the waters that your vessel will be plying.
- Check that you have the handbook on board. Make sure that you read this handbook so that the operation of the receiver is clearly understood.

SATELLITE COMMUNICATIONS



Presently there are various types of Satellite communications terminals in use. A few of these systems are-

INMARSAT C This facility can provide a data link via satellite, inclusive of Enhanced Group Calling which will provide similar information that is received on a NAVTEX receiver (MSI)..

Inmarsat ship-earth stations can be utilized for distress alerting. All the above terminal types are fitted with a Distress Alert function (or panic button) which can automatically transmit a distress message via the Inmarsat satellite network in much the same way as an EPIRB. However, because these terminals are computer based, it is possible to program far more information into a distress message than with an EPIRB. Standard text messages are available indicating the exact nature of the distress, e.g., fire, explosion, collision, etc. or, if time permits, the operator can key in his/her own message including the number of crew, injuries sustained, availability of survival equipment and so on. Such terminals are connected to the vessel's GPS navigation system, thus providing a continually updated and accurate position for inclusion in the distress message.

RADIOTELEPHONE CALLING PROCEDURE

Atmospheric conditions and congestion on calling frequencies in high traffic areas can result in stations not receiving each other. When a station wishes to communicate with another station, the call shall always be in the following format.

(On the calling frequency e.g. 2182 kHz, 4125 kHz, CH16)

THE NAME OF THE STATION CALLED (3 TIMES)
THIS IS
THE NAME OF THE STATION CALLING (3 TIMES)
I HAVE ONE MESSAGE (OR ONE TELEPHONE CALL) FOR YOU,
MY WORKING FREQUENCY IS ..... KHZ. OVER.

(On the calling frequency, the called station should reply as follows)

THE CALLING STATION'S NAME (3 TIMES)
THIS IS
THE NAME OF THE STATION REPLYING (3 TIMES)
MY WORKING FREQUENCY IS .....KHZ. OVER.

When no contact is made after the initial call, the calling station should allow a reasonable time to lapse, depending on the amount of activity on that frequency, before calling again. If no contact is made after three such calls with breaks of two minutes between each call, the calling station should consider trying another frequency band which may be more suitable for communication, or should wait for a period of approximately 3 minutes before resuming calls on the original frequency. It is very poor operating procedure, and extremely irritating to other stations who may be listening on the frequency, to endlessly repeat calls at short intervals to a station who may either not be receiving you or, for some reason, may be unable to answer you.

Once contact is established and the two stations have agreed on working frequencies, they shall both change to those working frequencies to continue communication.
The two stations shall now re-establish contact on the working frequencies by calling each-other, using the following procedure:

THE NAME OF THE CALLED STATION (ONCE)
THIS IS
THE NAME OF THE CALLING STATION (ONCE)
HOW ARE YOU RECEIVING ME ? OVER

Once contact is established on the working frequencies, both stations shall thereafter use each other's name once at the beginning of every transmission. (See the example on page 22).

(Note on calling and answering frequencies - When a ship station calls a coast station on either 2182 kHz or CH16, the coast station will invariably answer the call on the same frequency. However, when the ship calls on one of the HF bands the coast station will NOT answer on the same frequency but on the associated paired frequency. For example, if a ship calls on 8255 kHz the coast station will reply on 8779 kHz NOT ON 8255 kHz. A table of the most commonly used calling and answering frequencies follows on page 21.).

TABLE OF CALLING, ANSWERING AND DISTRESS FREQUENCIES

SHIP STATION CALLS ON	COAST STATION REPLIES ON	CHANNEL	EMISSION TYPE
156,8 Mhz	156,8 Mhz	16	G3E
2182 kHz	2182 kHz	-	J3E
4125 kHz	4417 kHz	421	J3E
8255 kHz	8779 kHz	821	J3E
***12290 kHz	12290 kHz	- - -	J3E
***16420 kHz	16420 kHz	- - -	J3E
*12359 kHz	12359 kHz	- - -	J3E
*16537 kHz	16537 kHz	- - -	J3E
22060 kHz	22756 kHz	2221	J3E

* These frequencies may be used for call and reply to coast stations in the simplex mode only.
***These frequencies are to be used to contact search and rescue co-ordination centres only.

RADIOTELEGRAMS

A station wishing to send a telegram, either to a destination on land or to another vessel at sea, shall always send the telegram in the following format.

NAME OF STATION SENDING THE MESSAGE
SERIAL NUMBER OF THE TELEGRAM
NUMBER OF WORDS
DATE
TIME OF HANDING IN OF THE TELEGRAM
NAME OF THE ACCOUNTING AUTHORITY (QRC)
ADDRESS
TEXT
SIGNATURE
RADIO TELEGRAM ENDS.

The station receiving the telegram shall acknowledge receipt of the telegram in the following format:

NAME OF THE STATION THAT SENT THE TELEGRAM
THIS IS
THE NAME OF THE STATION THAT RECEIVED THE TELEGRAM
“your number ..... received, over”

The station that sent the telegram should not consider the telegram to be successfully delivered until acknowledgment of receipt is given by the receiving station.

PLEASE NOTE.

When difficult words/figures are transmitted or when language difficulties arise or poor conditions are prevalent on the frequencies employed, the use of the phonetic alphabet is recommended.

EXAMPLE OF THE TRANSMISSION OF TRAFFIC

The vessel SEALINK has a telegram to send to the Port Captain in Cape Town advising of a change in her ETA. As she is outside VHF or MF range, her operator decides to use the 8 Mhz band. The communication procedures would be as follows:

On 8255 kHz: "CAPETOWNRADIO CAPETOWNRADIO CAPETOWNRADIO, THIS IS SEALINK SEALINK SEALINK, I HAVE ONE RADIOTELEGRAM FOR YOU, WHAT IS YOUR WORKING CHANNEL PLEASE? OVER"
(Note that SEALINK asks CAPETOWNRADIO for his working channel instead of nominating a working frequency as would have been the case if the call was made on 2182 kHz).

On 8779 kHz: "SEALINK SEALINK SEALINK, THIS IS CAPETOWNRADIO CAPETOWNRADIO CAPETOWNRADIO, GO TO CHANNEL 805 [8207/8731 kHz] AND STAND BY, YOUR TURN IS NUMBER 2, OVER"

On 8255 kHz SEALINK responds: "CAPETOWNRADIO THIS IS SEALINK, CHANNEL 805 GOING UP AND STANDING BY"

SEALINK then retunes his transmitter to 8207 kHz and his receiver to 8731 kHz and waits for CAPETOWNRADIO to call him. When he is ready to work SEALINK, the CAPETOWNRADIO operator will call on 8731 kHz as follows:

On 8731 kHz: "SEALINK THIS IS CAPETOWNRADIO, LISTENING CHANNEL 805, DO YOU RECEIVE ME? OVER"

SEALINK should use this call to fine-tune his receiver to obtain the clearest reception for working and then reply:

On 8207 kHz: "CAPETOWNRADIO THIS IS SEALINK, RECEIVING YOU LOUD AND CLEAR, HOW DO YOU RECEIVE ME? OVER"

On 8731 kHz: "SEALINK THIS IS CAPETOWNRADIO, YOU ARE ALSO LOUD AND CLEAR, SEND YOUR MESSAGE, OVER"

On 8207 kHz: "CAPETOWNRADIO THIS IS SEALINK, MESSAGE BEGINS, SEALINK/ZTUG, MESSAGE NUMBER 1, NUMBER OF WORDS 10, DATE 27, TIME FILED 1300UTC, QRC SA01, ADDRESS PORT CAPTAIN CAPETOWN, TEXT READS AMENDED ETA 28/0900LT DUE BAD WEATHER, SIGNATURE MASTER, RADIOTELEGRAM ENDS, OVER"
(Note - In the above message the chargeable number of words are 10, i.e. PORT CAPTAIN CAPETOWN AMENDED ETA 28/0900LT DUE BAD WEATHER MASTER. The remainder are purely for identification of the message and ease of transcription.)

On 8731 kHz: "SEALINK THIS IS CAPETOWNRADIO, YOUR NUMBER 1 RECEIVED, OVER"

On 8207 kHz: "CAPETOWNRADIO THIS IS SEALINK, THANK YOU, I HAVE NOTHING FURTHER TO COMMUNICATE, OUT"

On 8731 kHz: "SEALINK THIS IS CAPETOWNRADIO, ROGER, OUT"

PLEASE NOTE: The use of the expression "OVER AND OUT", although fairly common, is incorrect and poor procedure. The word "OVER" is an invitation for the station with whom you are communicating to take his turn transmitting whilst you listen. The word "OUT" means that you have now ceased communications. Therefore to say "OVER AND OUT" is contradictory as it literally means that you are inviting the other station to transmit, but at the same time telling him that you are no longer listening!

ORDER OF PRIORITY OF COMMUNICATIONS IN THE MARITIME MOBILE SERVICE

1. Distress calls, Distress messages and Distress traffic.

2. Communications preceded by the Urgency signal.

3. Communications preceded by the Safety signal.

4. Other communications.

RESTRICTIONS ON THE USE OF RADIO EQUIPMENT

It is forbidden to:

- exchange traffic other than distress, urgency or safety on 2182 kHz, 4125 kHz or VHF CH16.
- use offensive or abusive language.
- install or be in possession of unlicensed radio apparatus of any kind.
- engage in communications of any kind without the use of the vessel's licensed name and/or call sign during every transmission.
- use MF and/or HF equipment whilst moored in any harbour or marina unless it is used for purposes of distress, urgency or safety.
- disclose the contents of telegrams, messages or radiotelephone calls.
- exchange unnecessary signals of any kind.
- use radio installations for conversations other than those necessary for the exchange of authorised messages or radiotelephone calls.

USE OF RADIO EQUIPMENT WHILST MOORED IN HARBOURS

The radio installation onboard a vessel berthed in a port or a marina, or at anchor in a harbour, in the RSA shall not be used for any communication except in the following instances and on **VHF ONLY:**

- to exchange traffic with the nearest coast station.
- to communicate with the port operations services, and
- to communicate with another vessel on its way to the harbour or berth **provided** the communication is limited to navigational safety.

The above restriction does not apply to the apparatus used for establishing communication via any satellite of the Inmarsat organization

PRESCRIBED BOOKS AND DOCUMENTS

The following books and documents must be carried by all vessels equipped with a radiotelephone installation:

- The ship station radio licence;
- The radio operator's certificate
- The I.T.U Manual for use by the Maritime Mobile and Maritime Mobile Satellite Services (For local vessels of under 300 GRT this brochure will suffice);
- A radiotelephone logbook, obtainable from the South African Maritime Safety Authority.

RECOMMENDED ADDITIONAL EQUIPMENT

CLOCK:

A reliable clock with a face of approximately 13 cm (5 inches) in diameter, clearly marked to indicate the Silence Periods, should be securely mounted within sight of the radiotelephone operating position. Radiotelephone silence periods are customarily marked in blue.

EMERGENCY LIGHT:

An electric lamp, operated from the radio or emergency batteries, should be provided. The lamp should adequately illuminate all the controls of the radiotelephone installation and the Card of Instructions.

CARD OF INSTRUCTIONS:

A Card of Instructions giving a clear summary of the Distress operating procedure, the vessel's name and callsign and the name and address of the owners, should be displayed in clear view of ALL operating positions i.e. if the VHF is installed at a different position to the MF/HF radiotelephone equipment, a separate card should be provided for both.

SIMPLEX COMMUNICATIONS

If two stations are communicating with each other on the same frequency i.e. 2182 kHz or VHF CH16, it is known as simplex communication. The two stations cannot transmit at the same time and have to take turns to transmit while the other station is receiving. Intership communications are normally done in the simplex mode i.e. both parties are alternately transmitting and receiving on the same frequency. The use of the word "OVER" at the end of each station's transmission indicates that it is now the turn of the other station to transmit

DUPLEX COMMUNICATIONS

When two stations are communicating with each other using two different frequencies e.g. transmit on 4125 kHz and receive 4417 kHz. The station transmitting on 4125 kHz will monitor the signals from the other station on 4417 kHz, thus enabling both stations to transmit and receive simultaneously. Duplex working may also prevent a third station from monitoring the conversation of both parties at the same time. However, due to physical limitations on the placement of antennas and the current state of technology, full duplex operation is presently not possible on small craft.

BATTERIES

As most stations use batteries as their prime source of power, a basic knowledge of the operation of a battery is required to successfully maintain the station in good working order.

A battery is a collection of cells wherein chemical energy is converted to electrical energy and vice-versa. Marine batteries are usually of the lead-acid type which is made up of a number of cells consisting of two sets of lead plates, separated by wooden or porous plastic separators, and filled with a dilute sulphuric acid solution called the electrolyte. One set of plates are the positive plates, made of lead peroxide and a chocolate brown colour when the battery is fully charged. The other set are the negative plates, made of pure lead, which should be a slate or purple-grey colour when charged.

When discharged both the positive and negative plates form lead sulphate. This is caused by the chemical reaction during discharge when Sulphur and Oxygen are transferred from the electrolyte to the plates, thus reducing the Specific Gravity, or density, of the electrolyte. Plates in a discharged condition are easily recognised by this formation of lead sulphate, which appears as a white deposit on the plates. Upon re-charging, providing the battery has not been left too long in a discharged condition, the Sulphur is transferred back to the electrolyte and Hydrogen is given off to the air, thus increasing the specific gravity. If the battery has been left in a discharged condition for too long, the lead sulphate crystalises and becomes hard, causing the plates to buckle and possibly touch each other, resulting in a short circuit and making the battery unserviceable. In extreme cases the casing may be damaged, allowing the electrolyte to leak and corrode the battery box or locker.

A Hydrometer is used to measure the specific gravity (S.G.) of the electrolyte, which will vary between 1270 - 1280 for a fully charged battery and 1150 - 1200 for a discharged battery. It is adviseable not to allow the S.G. to fall much below 1200 to prevent the formation of lead sulphate on the plates. Ideally the S.G. should be maintained around 1250 - 1260 by regular charging or by keeping the battery on float charge. Try and develop the habit of checking the S.G. weekly, it only takes a few minutes and can save you money, or your life!

The electrolyte should be approximately 5 mm above the tops of the plates and should be maintained at this level by the addition of distilled water when necessary (**NEVER ADD ACID**).

The voltage of a single cell is normally 2 volts on load i.e. when the radio apparatus is switched on and drawing power, and therefore the voltage of a complete six cell battery (the type normally used for marine purposes) is 12 volts. Most large vessels use a 24 volt supply i.e. two 12 volt batteries connected in series, but the majority of small craft operate on a 12 volt supply, particularly if there is only VHF fitted.

BATTERY MAINTENANCE

Ensure that all terminals are clean and connections are tight and cover terminals with grease or petroleum jelly to prevent the build-up of lead sulphate. Check that plates are covered with electrolyte, add distilled water if necessary but **never add acid to batteries**. Charge daily if possible but do not charge at excessive charging currents. Do not allow batteries to stand discharged for prolonged periods. Test specific gravity levels weekly, (1275 fully charged, 1150 discharged). Keep naked lights away from batteries when on charge and keep battery boxes clean, dry and well ventilated. Ensure that the batteries are properly secured and remove all metal objects lying around the inside of the battery compartment. Do not drop batteries or treat them roughly. Record s.g. levels on a weekly and voltage levels on a daily basis.

RADIOTELEPHONE LOG BOOK

Every ship station should keep a radiotelephone logbook (diary) which should be treated as part of the vessel's official papers, but completed separately in the manner indicated below. It should always be available for inspection by authorised Inspectors/Surveyors. The time of all entries should preferably be in Coordinated Universal Time (UTC). If ship's time is used, a daily entry recording the difference between ship's time and UTC should be made.

The master must inspect and sign each day's entries in the log. If the master is not the radiotelephone operator the latter must complete and sign the log daily and submit it to the master for his signature, drawing his attention to any entries of importance.

ENTRIES TO BE MADE IN THE LOG BOOK

1. Name of the operator and times at which he goes on and off watch, the time at which radio watch is for any reason discontinued, together with reason and the time at which radio watch was resumed.
2. Details of all distress messages heard or sent and of any distress traffic which takes place. It is important that the general sense of the messages should be entered.
3. A statement each half hour during the hours of watch that the silence period has been observed.
4. A summary of all urgency and safety communications received.
5. A record of communications exchanged between the ship station and coast stations or other ship stations. Entries in respect of radio telegrams or radiotelephone calls should be restricted to the serial number of the message or call and the time sent or received. Difficulties in disposing of traffic should be recorded.
6. Important service incidents such as breakdowns and the repairs effected.
7. Details of the charging of the batteries, times on charge, time off charge, and entries as to the general condition of the batteries should be made at least once per day.
8. The approximate position of the ship at least once per day.
9. Details of the weekly tests of the portable radio equipment.
10. The name, address and certificate number of the radio operator/s.
11. Times of arrival at, or depature from, port and the name of the port.
12. Daily time checks of the clock, if fitted, including any errors observed and corrections made.

SHIP STATION LICENCES

Every marine radio installation shall be licenced by the Independent Communications Authority of South Africa (Icasa). The licence shall be kept on board and be readily available for inspection The conditions of issue of the licence shall be observed at all times. Ship station licences are **NOT TRANSFERRABLE** and all changes of ownership of the vessel, equipment or addresses of the owners shall be reported to Icasa.. Licences expire annually on 31st December and should be renewed before 31st January of the following year.

POSSESSION AND SALE OF RADIO EQUIPMENT

No person shall have any radio apparatus in his possession, unless he is the holder of a valid radio licence or permit, issued by the Independent Communications Authority of South Africa. No person to whom a licence or certificate was issued shall transfer such licence or certificate or surrender it in any other way in favour of someone else. Radio apparatus of any sort shall only be sold to a person holding a valid licence for the relevant apparatus or a Radio Dealers Registration Certificate. Radio transmitting apparatus shall be restricted to the frequencies specified on the licence and to the relevant make and models that is licensed on the Frequency Spectrum License that is issued by Icasa. No person shall use radio apparatus for a purpose other than that for which the licence was issued, or communicate with unlicensed stations for any purpose. Persons transgressing the Electronic Communications Act and Radio Regulations shall be liable on conviction to a fine not exceeding R500 000, or to imprisonment for a period not exceeding three years, or to both such fine and imprisonment and the court making such

conviction may order confiscation of their apparatus.**The frequency spectrum licence and callsign shall always be displayed near every operating position.**

CHANGES AND MODIFICATIONS

After the approval and licencing of the radio installation, no changes or modifications shall be made to the installation **without prior permission** from Icasa. Only approved frequencies may be used and then only for the purpose for which they are authorised, i.e. ship to shore frequencies may not be used for intership communication and vice versa.

POWER OUTPUT OF RADIO APPARATUS

Ship stations may use up to 400 watts peak envelope power (PEP) on the MF band and 25 watts on VHF, but should radiate only as much power as is necessary to ensure satisfactory communications, i.e. two stations close to each other should use **low** power when communicating.

MISCELLANEOUS REQUIREMENTS

The authorities of any country where a vessel calls may require the production of the ship station licence and/or operator's certificate. Failure to produce such documents may result in the sealing of the radio installation or detention of the vessel.

The licencee, and all employees having access to radio traffic or radiotelephone apparatus, must preserve the secrecy of private correspondence.

Any station making transmissions for test, adjustments, etc. must transmit its name or callsign at short intervals during each transmission.

Stations should not close down before:

- all operations resulting from Distress, Urgency or Safety signals are concluded; and
- as far as possible, all traffic originating at, or destined for, coast stations in range has been disposed of.

Radio operators must observe the terms and conditions of their ship station licences.

Except in the case of Distress, the coast station controls the communications in its area and ship stations must not interfere with the working of the coast station. Radio operators must obey any instructions regarding communications given by the coast station.

PHONETIC ALPHABET

A	ALPHA	N	NOVEMBER
B	BRAVO	O	OSCAR
C	CHARLIE	P	PAPA
D	DELTA	Q	QUEBEC

E	ECHO	R	ROMEO
F	FOX-TROT	S	SIERRA
G	GOLF	T	TANGO
H	HOTEL	U	UNIFORM
I	INDIA	V	VICTOR
J	JULIET	W	WHISKY
K	KILO	X	X-RAY
L	LIMA	Y	YANKEE
M	MIKE	Z	ZULU

Figures are pronounced as follows:

1 = One
2 = Two
3 = Three
4 = Four
5 = Fife
6 = Six
7 = Seven
8 = Eight
9 = Niner
0 = Zero.

A FEW HINTS ON THE EVERYDAY USE OF MARINE RADIO EQUIPMENT.

1. If you can not establish communications, check the following:
- that you are calling and listening on the correct frequencies,
- that your transmitter is tuned properly, and
- that your receiver gain controls are adjusted properly.

2. If your transmitter will not tune up, check the following;
- that the antenna connections are secured,
- that the antenna is not shorting against any metal objects,
- that none of the fuses are blown,
- that the batteries are not discharged, and
- that you are using the correct mode of emission.

3. If the transmitter tunes up poorly (i.e. reduction in transmit power), check the following:
- that the battery voltage for a 24 Volt supply does not drop below 22 Volts,
- if the antenna current is low, but steady check the high/low power switch setting.
- that the supply cables from the battery to the installation are thick enough to handle the required current.

4. If you are told that your signals are distorted, check the following:
- that you are using the correct mode and that your transmitter is properly tuned.
- that your supply voltage is not too low or too high.

5. If you cannot tune in another station's signals, check the following:
- that you are listening on the correct mode(J3E)
- that the RF/AF gain controls are not set too high/low.

6. If you are told that your signals are breaking up or are intermittent, check the following:
- faulty microphone or microphone connections,
- antenna shorting intermittently,

- that the antenna current is sufficient.

7. Note down all the actions that you will be performing to enable you to send a distress call on 2182 kHz together with the basic sequence and wording of a distress call and message and post it next to the operating position of your radio installation. This will enable unskilled personnel to send a distress message in the absence of the certificated operator, if required.

THE FOLLOWING ARE EXAMPLE QUESTIONS THAT MAY BE ASKED DURING THE COURSE OF THE EXAMINATION.

PART -A- DISTRESS, URGENCY AND SAFETY.

1. What is the international distress frequency on 2 MHz?
2. What is the international distress frequency in the VHF marine band?
3. Which frequency in the 4 MHz band is used to supplement the distress frequency mentioned in "1."?
4. On which frequency would you call a coast station if you had a radiotelephone call to clear when distress communications are in progress on 2182 kHz?
5. What action shall be taken by any station receiving a distress call or message on any frequency?
6. When are the silence periods on the 2 MHz distress frequency?
7. What is the purpose of the silence periods?
8. What is the purpose of the radio telephone alarm signal?
9. Describe the composition of the alarm signal.
10. Name three instances when ship stations may transmit the radio telephone alarm signal.
11. Your are on the vessel called NONSUCH 25 miles South West of Cape Point; You have struck a submerged object; Your vessel is in a sinking condition and you require immediate assistance! Give an example of an appropriate distress call and message, assuming that this transmission will take place on the 2 MHz distress frequency.
12. When would a station, receiving a distress call, decide to acknowledge receipt thereof?
13. You are on a vessel called WAVECREST. Give an example of a message acknowledging the distress message sent by NONSUCH.
14. Name three instances when a ship station would decide to relay a distress message received from another station.
15. You are on the WAVECREST, you have received and acknowledged the distress message from NONSUCH, but you are in no position to assist.
    Give an example of a relayed distress call and message.
16. On whose authority is a distress call and message sent?
17. Under which circumstances would a ship station acknowledge receipt of a mayday relay message sent by a coast station?
18. How would a station in control of a distress situation impose silence on that frequency?
19. How would a station not in control of a distress situation impose silence on that frequency?
20. Which station controls a distress situation?
21. Describe the meaning of the word PRUDONCE.
22. Under which circumstances would the word PRUDONCE be used in radiotelephony.
23. You are on the WAVECREST which went to the assistance of the NONSUCH. You have rescued all the survivors and the distress situation is now over.
    Give an example of an appropriate call and message canceling the silence that was imposed on that

frequency.
24. Describe the radiotelephone URGENCY signal.
25. Under which circumstances would you decide to transmit an URGENCY message?
26. Give an example of an urgency call and message.
27. How would a ship station obtain urgent medical advice?
28. Describe the safety signal as used in radiotelephony.
29. What does the safety signal indicate?
30. Give an example of a safety call and message.
31. On which frequencies would you decide to transmit urgency and safety messages?
32. How would you indicate to other stations that the urgency situation is over?
33. For how long should the radiotelephone alarm signal be transmitted?
34. What is a Navtex Receiver?
35. What type of messages will it receive?
36. What is the definition of a SART?
37 What does a SART do?
38. What Checks must be done on an EPIRB?
39. What checks must be done on a Navtex Receiver?
40. What checks must be done on a SART?

PART -B- GENERAL COMMUNICATIONS

1. Describe how you would call a coast station on VHF or 2 Mhz in order to:
- send a radio telegram.
- make a radio telephone call.
2. On which frequency would you call a coast station in the:
- 2mhz band.
- 4mhz band.
- 8mhz band.

   if you have a radio telegram/telephone call to clear.
3. Describe the composition of a radio telegram in the prescribed sequence.
4. Which entries should be made in the radio telephone logbook?
5. What does the coast station want to know when they ask for your QRC? (Radio accounting authority).
6. Describe briefly how radio batteries should be maintained.
7. Under which circumstances may radio installations be used on vessels berthed in harbours.
8. Describe what action should be taken in a case of accidental transmission of an alarm signal.
9. Describe the use of the following frequencies in the VHF band.
   CH16 CH12
   CH06 CH13
   CH70 CH25
10. Describe the use of the following frequencies in the:
    2mhz marine band:
    2191kHz.
    2356 kHz.
    4 Mhz marine band:
    4125 kHz
    4146 kHz
    UHF band:
    406.025 Mhz
11. Describe the meaning of the following marine radio terms:
    EPIRB
    SART
    DSC

J3E
G3E

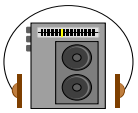
12. What documentation must be displayed near the operating position of a radio installation?
13. When would you decide to use the phonetic alphabet?
14. What readings would you expect when checking the specific gravity of a lead-acid battery when:
- fully charged?
- effectively discharged?

15. What liquid would you use for topping-up a lead-acid battery cell?
16. What documentation is required before posession of radio apparatus can be taken?
17. For what period may radio licences be transferred?
18. Is transgression of the Electronic Communications Act or Radio Regulations a criminal offence?

PART -C- TUNING/SWITCHING AND FAULT FINDING ON EQUIPMENT.

1. Candidates will be asked to switch-on the transmitter and receiver and tune the equipment on 2182 kHz and a few common working frequencies.
2. They will be required to demonstrate the use of the various controls and switches.
3. Candidates should demonstrate their ability to switch on, operate and change channels in the VHF band.

PART -D- PHONETIC ALPHABET



Candidates will be asked to identify the characters of the phonetic alphabet by listening to a pre-recorded cassette. These characters will include figures and letters.