

THE MERCHANT SHIPPING  
(RADIO AND DIRECTION-FINDERS) RULES, 1964

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L.N. 68 of 1964

## MERCHANT SHIPPING ACT, 1962

(1962, No. 30)

## The Merchant Shipping (Radio and Direction-Finders) Rules, 1964

In exercise of the powers conferred by Sections 159 and 160 of the Merchant Shipping Act, 1962, the Federal Minister of Transport has made the following Rules—

*Commencement : 11th June, 1964*

## PART I.—GENERAL

1. These Rules may be cited as the Merchant Shipping (Radio and Direction-Finders) Rules, 1964.

Citation  
and com-  
mencement.

2. Parts I to IV of these Rules shall apply to ships which are :—

Application.  
Parts I to  
IV.

- (a) sea-going Nigerian ships ; and
- (b) other sea-going ships while they are within any port in Nigeria ; but shall not apply to
  - (i) ships not propelled by mechanical means ;
  - (ii) pleasure yachts ;
  - (iii) fishing boats ; or
  - (iv) cargo ships of less than 300 tons.

3. In these Rules, unless the context otherwise requires, the following expressions shall have the meaning hereby respectively assigned to them, that is to say :—

Interpreta-  
tion.

"The Act" means the Merchant Shipping Act, 1962.

"Cargo ship" means a ship other than a passenger ship ;

"Connected" means electrically connected ;

"Existing Installation" means :

(a) an installation wholly installed before the date on which these Rules come into operation ; and

(b) an installation, part of which was installed before the said date, and the rest of which consists either of parts installed in replacement of identical parts, or parts which comply with the relative requirements of these Rules.

"Mile" means a nautical mile of 6,080 feet ;

"Operating Position" in relation to any equipment means the position normally occupied by a person when operating that equipment ;

"Radiotelegraph ship" means a ship, being a ship to which these Rules apply, which is provided with a radiotelegraph installation and which is not a radiotelephone ship ;

"Radiotelephone distress frequency" means, a frequency of 2182 kc s ;

"Radiotelephone ship" means a cargo ship, being a ship to which these Rules apply, of not less than 300 tons, but of less than 1,600 tons the owner of which has given the Minister in writing (which has not been withdrawn) that the ship is provided with a radiotelephone in compliance with these Rules ;

"Radio watch" in the case of radiotelegraph ships, means listening on a frequency of 500 kc s and in the case of radiotelephone ships means listening on the radiotelephone distress frequency ;

"Silence periods" means the periods of three minutes beginning for the purposes of radiotelegraphy at 15 minutes and at 45 minutes after each hour, and for the purposes of radiotelephony at each hour and at 30 minutes after each hour, in every case determined according to Greenwich Mean Time;

"Tons" means gross tons.

In relation to waves and signals:--

"Type A1" means radiotelegraphy by the keying of a continuous wave on and off;

"Type A2" means amplitude modulated radiotelegraphy by the keying of a modulating audio frequency or of an emission continuously modulated by an audio frequency; and

"Type A3" means double sideband amplitude modulated radiotelephony.

"Type B waves" means damped waves.

"Wireless operator" means a person who, holds a valid certificate of proficiency or competence in radiotelegraphy of the first or second class granted by the Postmaster-General of the United Kingdom, or by an authority empowered in that behalf by the laws of some part of the Commonwealth, and recognised by the Postmaster-General of the United Kingdom as the equivalent of such a certificate granted by him.

#### Classification of ships

4. The ships to which these Rules apply shall be classified as follows--

CLASS I-- Ships carrying more than 250 passengers or in respect of which there is in force a certificate issued by the Minister, or by any authority empowered on that behalf by the laws of any country other than Nigeria, to the effect that they are fit to carry more than 250 passengers, and which,

(a) in the case of a Nigerian ship registered in Nigeria, are at sea for more than 16 hours between two consecutive ports;

(b) in the case of other ships, arrive at a port in Nigeria having been at sea more than 16 hours since leaving the last port, or in respect of which clearance or transire is sought from a port in Nigeria for a voyage requiring more than 16 hours at sea before reaching port.

CLASS II-- (a) Passenger ships other than those of Class I.

(b) Cargo ships of 1,600 tons and upwards.

CLASS III-- Cargo ships of 300 tons and upwards but of less than 1,600 tons.

#### Provision of radio installations.

5.--(1) Every ship of Class I and Class II shall be provided with a radiotelegraph installation which shall include the equipment specified in the First and/or Second Schedules to these Rules.

(2) Every ship of Class III shall be provided with a radiotelephone installation which shall include the equipment specified in the Third Schedule to these Rules, or, with a radiotelegraph installation which shall include the equipment specified in the First and/or Second Schedules to these Rules. Provided that the main and emergency radiotelegraph transmitters in a ship of Class III may be combined in a single instrument, if that instrument is capable of complying with the requirements of Parts I and III of the said Second Schedule.



6.—(1) All equipment the requirements for which are specified in these Rules shall be such that it will be free of mechanical defects and comply with the said requirements—

Climatic  
and  
Durability  
tests.

(a) while undergoing the vibration, dry heat, and low temperature tests specified in the Fourth Schedule to these Rules ;

(b) when subjected to the damp heat test specified in sub-paragraph (4) of paragraph 3 of the said Schedule ; and

(c) immediately after undergoing such of the other tests specified in the said Schedule as are applicable to the equipment in the circumstances.

(2) Any such equipment which is intended for use in the open or in an open boat shall be such that after undergoing the mould growth test specified in the Fourth Schedule to these Rules, no mould growth will be present on it.

7. At no time while the ship is at sea shall the interference or mechanical noise produced by the radio installation required by these Rules or by any other equipment in the ship be sufficient to prevent the efficient reception of radio signals by means of such installation.

Interference  
with  
reception.

8.—(1) All parts and wiring to which this Rule applies shall be protected from accidental access and, except in the case of a generator or convertor, shall be isolated automatically from all source of electrical energy when the means of protection are removed. Any such parts which are capacitors in a transmitter shall be capable of being discharged.

High  
Voltage  
parts.

(2) This Rule applies to all parts and wiring of the equipment specified in these Rules in which the direct and alternating voltages (other than radio frequency voltages) combine at any time to give an instantaneous voltage greater than—

(a) 50 volts in the case of equipment specified in the Fifth Schedule to these Rules ;

(b) 250 volts in the case of all other equipment.

9. Means shall be provided on board every ship to which these Rules apply for the charging from the ship's main source of electrical energy of any batteries which are provided as a source of electrical energy for any part of the equipment required by these Rules. An alternative means of charging such batteries shall also be provided if the means of charging such batteries is a rotary convertor.

Charging of  
batteries.

## PART II—RADIOTELEGRAPHY

10. Subject to the provisions of paragraph (2) of Rule 5 of these Rules, the main and emergency radiotelegraph equipments provided on board a radiotelegraph ship shall be electrically independent of each other.

Main and  
Emergency  
Equipment.

11.—(1) Every radiotelegraph installation provided on board a radiotelegraph ship shall be installed in one or more radiotelegraph rooms not used for any purpose other than the operation of radio equipment. The radiotelegraph rooms shall be in such a position that there will be no disturbance by extraneous noises or otherwise with the effective reception of radio signals.

Radio  
Telegraph  
Room.

(2) Every radiotelegraph installation provided on board a radiotelegraph ship shall be installed in such a position that it will be protected against disturbance of its effectiveness by water or by extremes of temperature.

(3) Every radiotelegraph room shall be provided with—

(a) an efficient two-way means of calling and voice communication with the bridge and any other place from which the ship is normally navigated. Such means of communication shall be a voicepipe or a telephone, or some other equally efficient means and shall be independent of the main communication system of the ship and of the ship's main source of electrical energy;

(b) a reliable clock, equipped with a dial not less than 5 inches in diameter and a centre seconds hand, securely mounted in such a position that the entire dial can be easily and accurately observed from the radiotelegraph operating position and, if the ship is provided with an auto-alarm, from the position normally occupied by a person testing the auto-alarm;

(c) an electric lamp, operated from the source of electrical energy required by paragraph (2) of Rule 14 of these Rules and permanently arranged so as to be capable of providing adequate illumination of the operating controls of the main and emergency radiotelegraph installations and of the clock required by this Rule, and controlled by two-way switches placed respectively near the entrance to the radiotelegraph room and at the radiotelegraph operating position;

(d) an additional electric lamp, for use as an inspection lamp, operated from the aforesaid source of energy, and provided with a flexible lead of sufficient length to enable all parts of the radiotelegraph installation to be easily seen;

(e) a chair capable of being fixed at the radiotelegraph operating position.

(4) A complete list of spare equipment and spare parts carried on board the ship for the maintenance of the radiotelegraph installation, shall be available in every radiotelegraph room and shall indicate where such equipment and parts are kept.

(5) A calibration table or calibration curve for each transmitter and receiver forming part of the radiotelegraph installation shall always be available in the radiotelegraph room, unless the transmitter or receiver, as the case may be, is directly calibrated.

(6) In the case of a radiotelegraph installation which is not an existing installation, a complete diagram of the wiring of such installation shall always be available in a radio-telegraph room.

#### Aerials.

12.—(1) Every radiotelegraph ship shall be fitted with a main aerial and an emergency aerial; provided that the Minister may exempt any ship from the requirement of an emergency aerial if he is satisfied that the fitting of such an aerial is impracticable or unreasonable in the circumstances. Any ship so exempted shall carry a spare aerial completely assembled for immediate erection.

(2) Each of the halyards used for supporting such main aerial shall be fitted with a safety loop between the masthead or other aerial support and an aerial insulator. Such safety loop shall consist of a part of the halyard not less than three feet long, the loop being closed by a link not more than one foot three inches long with a breaking load not more than one-third of the breaking load of the aerial or the halyard, whichever is the less.

(3) A rigging plan of such aerials shall be available in a radiotelegraph room, and shall show the following—

- (a) elevation and plan views of the aerials ;
- (b) the measurements of the aerials in feet and inches ; and
- (c) the height of the aerials in metres measured in the manner specified in paragraph (3) of Rule 13 of these Rules.

(4) The main aerial and the emergency aerial (if any) shall, where practicable, be so rigged that damage to the one will not affect the efficiency of the other.

(5) The main and emergency aerials shall each be capable of being connected, as circumstances may require, to

- (a) the main transmitter, either directly or with the intervention of an amplifier ;
- (b) the main receiver ; and
- (c) the emergency transmitter.

The emergency aerial shall also be capable of being connected to the emergency receiver.

13.—(1) The normal ranges of the radiotelegraph transmitters provided in accordance with the foregoing provisions of these Rules shall not be less than—

Range of  
transmitters.

(a) in the case of a ship of Class I, 175 miles for the main transmitter and 150 miles for the emergency transmitter ;

(b) in the case of a ship of Class II, 150 miles for the main transmitter and 100 miles for the emergency transmitter ;

(c) in the case of a ship of Class III, 100 miles for the main transmitter and 75 miles for the emergency transmitter.

(2) The range of a transmitter for the purposes of these Rules shall be determined, at the option of the owner of the ship, either by reckoning or by test.

(3) For the purposes of these Rules the normal range of a radiotelegraph transmitter when determined by reckoning, shall be calculated by ascertaining the product of the root mean square current in amperes at the base of the main aerial and the maximum height in metres of the aerial measured from the load line mark indicating the greatest depth to which the ship may at any time or place be submerged in accordance with the Merchant Shipping (Load Line) Rules or, if there is no such mark on the ship, from the mean level of the surface of the water in which the ship is afloat. The product so ascertained in metre-amperes shall be converted to miles in accordance with the following table—

*Product in  
Metre-amperes*

*Equivalent  
in miles.*

102  
76  
45  
34  
10

175  
150  
100  
75  
25

(4) For the purposes of these Rules the normal range of a radiotelegraph transmitter, when determined by test, shall be the distance to which signals can be transmitted by such transmitter over the sea by day under normal conditions on a frequency of 500 kc/s. so as to set up at the receiver a total root mean square field strength of at least 50 microvolts per metre.

Supply of  
electrical  
energy.

14.—(1) There shall be available in every radiotelegraph ship while the ship is at sea, and at all reasonable times when the ship is in port for testing purposes, a supply of electrical energy from the ship's main source of electrical energy sufficient for the operation of the main radiotelegraph equipment in accordance with these Rules, and for the charging of any batteries which are a source of electrical energy for the radiotelegraph installation. The rated voltage of the supply of electrical energy for the main equipment shall be maintained within plus or minus 10 per cent. The supply of electrical energy shall, if it is a direct current supply, be of correct polarity. Provided that in any ship not engaged on an international voyage the aforesaid supply of electrical energy may be derived from a battery, in which case a duplicate battery shall also be provided for that purpose.

(2) The emergency equipment shall include a source of electrical energy independent of the propelling power of the ship and of the rest of the ship's electrical installation, and shall be capable of being brought into immediate operation by means of a switchboard situated in a radiotelegraph room or readily accessible therefrom. Any source of electrical energy provided in compliance with this paragraph shall be of such capacity and shall be maintained at all times when at sea in such a condition as to be able to supply continuously for a period of 6 hours, whether or not it is in use for any other purpose, a total current equal to the sum of—

(a) the current required to operate the emergency transmitter with the key up ;

(b) three-fifths of the difference between the current required to operate the emergency transmitter with the key down and the current required to operate it with the key up ;

(c) the current required to operate the emergency receiver ; and

(d) the current consumed by the electric lamp required by paragraph (3)(c) of Rule 11 of these Rules.

(3) The source of electrical energy provided under paragraph (2) of this Rule shall not be used at any time except for the operation of—

(a) the emergency transmitter and receiver ;

(b) the lamps required by paragraph (3) (c) and (d) of Rule 11 of these Rules ;

(c) the automatic keying device ;

(d) an auto-alarm ;

(e) a direction-finder.

Tools, etc.  
Sixth  
Schedule.

15. Every radiotelegraph ship shall be provided with the tools, measuring instruments, spare parts and other material specified in the Sixth Schedule to these Rules.

Exemption  
Class III  
ships.

16. The Government Inspector of Shipping may exempt any ship of Class III from any of the requirements of the foregoing provisions of this Part of these Rules, subject to such conditions as he thinks fit.



Provision  
of radio  
officers.  
Seventh  
Schedule.

17.—(1) Every radiotelegraph ship which upon proceeding to sea is not provided with an auto-alarm complying with the requirements specified in the Seventh Schedule to these Rules shall be provided with radio officers as follows—

CLASS I—three radio officers.

CLASS II—two radio officers if she is at sea for not more than 48 hours between consecutive ports, and three radio officers if she is at sea for more than 48 hours between consecutive ports.

CLASS III—one radio officer.

(2) Every radiotelegraph ship which upon proceeding to sea is provided with an auto-alarm complying with the aforesaid requirements shall be provided with radio officers as follows—

CLASS I—two radio officers.

CLASS II—one radio officer.

CLASS III—one radio officer.

Qualifi-  
cations of  
radio officers.

18.—(1) For the purposes of these Rules no person shall be qualified to be a radio officer on board a Nigerian ship unless he holds a valid certificate of proficiency or competence in radiotelegraphy of the first or second class granted by the Postmaster-General in the United Kingdom, or its equivalent granted by a competent authority empowered to do so in any Commonwealth country. In the case of at least one of the radio officers on board a Nigerian passenger ship, such certificate shall be a certificate of the first class.

(2) For the purposes of paragraph (1) of this Rule no certificate of proficiency or competence shall be deemed to be valid at any date if it was granted more than two years before that date and either

(a) the holder's periods of experience do not total three months, or

(b) the holder's last experience was more than 2 years before that date

unless the holder satisfies the issuing authority by re-examination or otherwise that he still possesses all of the qualifications described in his certificate. For the purposes of this paragraph the expression "experience" means experience at sea as a radio officer or wireless operator or experience as an operator of radiotelegraph apparatus at a radiotelegraph station maintained on land for communication with ships.

(3) At least one of the radio officers on board a Nigerian ship of Class I or Class II shall be a person who has had experience at sea as a radio officer or wireless operator for a total of not less than—

(a) two years in the case of ships of Class I;

(b) one year in the case of ships of Class II (a);

(c) six months in the case of ships of Class II (b), being ships of 3,000 tons or upwards;

(d) three months in the case of ships of Class II (b), being ships of 1,000 tons and upwards but under 3,000 tons,

(4) For the purposes of these Rules no person shall be deemed to be a radio officer on board a ship not registered in Nigeria unless he holds a valid certificate of proficiency or competence in radiotelegraphy granted by



an authority empowered or recognised in that behalf by the laws of the country in which the ship is registered and recognised by the Minister as the equivalent of such a certificate issued by the competent authorities in the Commonwealth.

Radio  
watch by  
radiotele-  
graph.

19.—(1) Subject to the provisions of paragraph (1) of Rule 20 radio watch shall be maintained at sea on board every radiotelegraph ship by a radio officer as follows—

(a) if the ship upon proceeding to sea is not provided with an auto-alarm complying with the requirements specified in the Seventh Schedule to these Rules :—

(i) in the case of a ship of Class I or Class II a continuous watch ;

(ii) in the case of a ship of Class III a watch of eight hours per day at the times specified in column 5 of the Eighth Schedule to these Rules in relation to the zone in which the ship then is ;

(b) if the ship upon proceeding to sea is provided with an auto-alarm as aforesaid :—

(i) in the case of a ship of Class I a watch of sixteen hours per day at the times specified in column 4 of the Eighth Schedule to these Rules in relation to the zone in which the ship then is ;

(ii) in the case of a ship of Class II or Class III a watch of eight hours per day at the times specified in column 5 of the Eighth Schedule to these Rules in relation to the zone in which the ship then is.

(2) Any auto-alarm provided on board a radiotelegraph ship shall be in operation at all times at which a radio watch is not maintained unless the auto-alarm has broken down since the ship last put to sea and cannot be repaired at sea so as to operate effectively.

Watch-  
keeping.

20.—(1) Every radio officer on board a radiotelegraph ship shall keep radio watch by means of headphone reception throughout his period of duty except when another radio officer keeps radio watch by headphone reception. Provided that—

(a) radio watch may be maintained by means of loud-speaker reception, or

(b) if loud-speaker reception is impracticable radio watch may be dispensed with except during a silence period,

for such periods as may be necessary to enable the radio officer to perform other duties in compliance with these Rules.

(2) Every radio officer on board a radiotelegraph ship provided with an auto-alarm complying with the requirements aforesaid shall, whenever radio watch ceases to be maintained during or at the end of his period of duty, connect the auto-alarm with the ship's main aerial, or with any other equally efficient aerial, and shall put the auto-alarm into operation. Every radio officer who leaves an auto-alarm in operation when he goes off duty shall before going off duty—

(a) test the efficiency of the auto-alarm ; and

(b) immediately report the result of such test to the master of the ship or to the officer in charge of the navigation of the ship.

(3) Every such radio officer who finds an auto-alarm connected to an aerial when he goes on duty shall immediately test the efficiency of the auto-alarm before making any adjustment thereto.

(4) While a radiotelegraph ship is at sea, the radio officer, or if there is more than one, the first radio officer, shall cause the following tests to be made—

(a) a test once a day of the emergency radiotelegraph transmitter connected with an artificial aerial complying with the requirements specified in paragraph 13 of Part III of the Second Schedule to these Rules;

(b) if the ship is engaged on an international voyage a test during every voyage of the emergency radiotelegraph transmitter connected with the emergency aerial, if any;

(c) a test once a day by voltmeter and once a month by hydrometer of any batteries which are a source of energy for the radiotelegraph installation;

(d) a test once a day of any other source of electrical energy provided for the emergency radiotelegraph equipment; and

(e) a test once a day of the audible alarm circuits and of the bells forming part of the auto-alarm.

(5) While a radiotelegraph ship is at sea, the radio officer, or if there is more than one, the first radio officer, shall take all steps within his power to cause the equipment referred to in these Rules to be properly maintained and when necessary to be repaired and adjusted. Such officer shall cause all batteries, being a source of electrical energy for any part of the radiotelegraph installation, which are found not to be fully charged to be brought up to that condition as soon as may be.

21. The transmitter forming part of the emergency radiotelegraph equipment shall not be used to transmit messages other than those relating to the safety of life at sea, unless such transmitter complies with the requirements specified in Part I of the Second Schedule to these Rules.

Uses of  
emergency  
transmitter

22.—(1) A radiotelegraph log-book in the form specified in the Ninth Schedule hereto shall be kept in a radiotelegraph room on board every Nigerian Radiotelegraph ship, and shall be available for inspection by any person authorised in that behalf by the Minister.

Radio Log

(2) Every radio officer on board such a ship shall, when on duty, enter in such log-book—

(a) his name;

(b) the times at which he goes on and off duty;

(c) the identifying number of each message transmitted by him or received by him, together with the time and date of such transmission or reception, the station to which each message is transmitted by him and the station from which each message is received by him; and

(d) a record of all incidents occurring during his period of duty which relate to the radiotelegraph installation and the operation thereof and which appear to him to be of importance to the safety of life at sea; in particular, he shall make the following entries—

(i) the full text of all the messages transmitted by him or received by him which relate to immediate assistance required by persons in distress at sea or above the sea;

(ii) the full text of all messages transmitted by him or received by him which are preceded by a signal in general international use as an urgency signal or a safety signal;

(iii) a record of the radio watch maintained by him during each of the silence periods;

(iv) a record of any incident occurring during his period of duty which affects the efficiency of the radiotelegraph installation ;

(v) a record of the tests conducted by him in accordance with paragraphs (2), (3) and (4) of Rule 20 of these Rules, and of the results of such tests ;

(vi) a record of the charging by him of any batteries used as a source of energy for the radiotelegraph installation ; and

(vii) if the ship is provided with an auto-alarm, details of any failure or repair thereof during his period of duty.

(3) The radio officer, or if there is more than one, the first radio officer, shall cause an entry to be made in such log-book at least once a day recording the time shown by the clock in each radiotelegraph room in comparison with Greenwich Mean Time, and any correction made in respect of that clock.

(4) The master of the ship and, if there is more than one radio officer, the first radio officer, shall inspect and sign such log-book once a day.

(5) Sections 134, 135 and 138 of the Act shall apply to radiotelegraph log-books as they apply to official log-books.

### PART III.—RADIOTELEPHONY

#### Aerial.

23. Every radiotelephone ship shall be fitted with an aerial, and in addition shall carry a spare aerial completely assembled for immediate erection. A rigging plan of the fitted aerial shall be available on board and shall show—

(i) elevation and plan views of the aerial ;

(ii) the measurements of the aerial in feet and inches ; and

(iii) the height of the aerial in metres measured in the manner specified in paragraph (3) of Rule 24 of these Rules.

#### Range.

24.—(1) The normal range of the radiotelephone transmitter provided in accordance with the foregoing provisions of these Rules shall not be less than 150 miles.

(2) The range of a radiotelephone transmitter for the purposes of these Rules shall be determined at the option of the Owner of the ship either by reckoning or test.

(3) For the purposes of these Rules the normal range of a radiotelephone transmitter, when determined by reckoning on the radiotelephone distress frequency, shall be calculated by ascertaining the product of the root mean square current in amperes at the base of the aerial and the maximum height in metres of the aerial measured from the lead-out insulator. The transmitter shall be deemed to comply with the requirements of this Rule if the product so ascertained is not less than—

(a) 9.6 metre-amperes on a frequency of 1,650 kc/s. or 7.5 metre-amperes on a frequency of 2,182 kc/s. in either case if the aerial has a horizontal top-length of not less than one-half of its maximum height measured from the lead-out insulator ;

(b) 14.7 metre-amperes on a frequency of 1,650 kc/s. or 12.8 metre-amperes on a frequency of 2,182 kc/s. in the case of any other aerial.

(4) For the purposes of these Rules, the normal range of a radiotelephone transmitter, when determined by test on the radiotelephone distress frequency, shall be the distance to which signals can be transmitted by such transmitter

over the sea by day under normal conditions on that frequency so as to set up at the receiver by the unmodulated carrier a total root mean square field strength of at least 25 microvolts per metre.

25.—(1) There shall be available in every radiotelephone ship while she is at sea a supply of electrical energy sufficient to operate the radiotelephone installation in accordance with these Rules. The supply of electrical energy shall, if it is a direct current supply, be of correct polarity. In the case of a radiotelephone installation which is not an existing installation an emergency source of electrical energy shall be provided in the upper part of the ship unless the main source is so situated. Each source of energy provided in accordance with this Rule shall be of such capacity as to be able to supply continuously for a period of six hours a total current equal to the sum of—

Supply of  
Electrical  
Energy.

- (a) one-half of the current required to operate the radiotelephone transmitter for the transmission of speech ;
- (b) the current required to operate the radiotelephone receiver ; and
- (c) the current consumed by the electrical lamp required by paragraph (d) of Rule 26 of these Rules.

(2) If a single battery is provided for the foregoing purpose means shall also be provided for either

- (a) operating the radiotelephone receiver and transmitter from the ship's main source of electrical energy ; or
- (b) float-charging the battery while it is in use, in which case there shall be adequate protection against voltage rise.

Such means shall be so designed as not to require the earthing of the ship's main source of electrical energy, and a filter shall be provided to prevent main borne interference from entering the receiver.

(3) When the batteries for the radiotelephone transmitter are not in use, each battery shall be capable of being fully charged within a period of not more than 16 hours by the means for charging required by Rule 9 of these Rules.

26. The following provisions shall apply to every radiotelephone ship

(a) An efficient two-way means of communication shall be provided between the place where the aforesaid radiotelephone installation is installed and any other place from which the ship is normally navigated.

(b) The radiotelephone installation required by these Rules shall be installed as high as practicable in the ship.

(c) A reliable clock shall be securely mounted within sight of the operating position ; and

(d) An electric lamp shall be provided and shall be operated from the emergency source of electrical energy required by Rule 25 of these Rules or, if no emergency source of electrical energy is so required, from the main source. The lamp shall be permanently arranged so as to be capable of providing adequate illumination of the operating controls of the radiotelephone installation and the clock required by sub-paragraph (c) of this Rule. The lamp shall be controlled by two-way switches placed respectively near an entrance to the room in which the radiotelephone installation is installed and at the operating position thereof in that room.

Miscellaneous  
requirements.



Radio-telephone operators.

27.—(1) Every radiotelephone ship shall be provided with at least one radiotelephone operator.

(2) For the purposes of these Rules no person shall be qualified to be a radiotelephone operator on board a Nigerian ship unless he holds a valid certificate of proficiency or competency in radiotelephony or radiotelegraphy granted by the Postmaster-General, of the United Kingdom or by an authority empowered in that behalf by the laws of some part of the Commonwealth, and recognised by the Postmaster-General of the United Kingdom as the equivalent of such a certificate granted by him.

(3) For the purpose of these Rules no person shall be deemed to be a radiotelephone operator on board a ship registered in a country other than Nigeria unless he holds a valid certificate of proficiency or competency in radiotelephony or radiotelegraphy granted by an authority empowered or recognised in that behalf by the laws of the country in which the ship is registered and recognised by the Minister as the equivalent of such a certificate issued by the competent authorities in the Commonwealth.

Radio watch by radio-telephone.

28. While a radiotelephone ship is at sea radio watch shall be maintained by a radiotelephone operator for at least 8 hours a day, at the times specified in Column 5 of the Eighth Schedule of these Rules in relation to the zone in which the ship then is.

Watch keeping.

29.—(1) Every radiotelephone operator on board a radiotelephone ship shall keep radio watch during the periods of duty assigned to him by the master of the ship.

(2) While a radiotelephone ship is at sea, the radiotelephone operator, or if there is more than one, the first radiotelephone operators, shall cause any batteries which are a source of electrical energy for the radiotelephone installation to be tested once a day and brought up to the fully-charged condition as soon as may be.

Radio-telephone log.

30.—(1) A radiotelephone log-book in the form specified in the Tenth Schedule hereto shall be kept near the radiotelephone installation in every radiotelephone ship, and shall be available for inspection by any person authorised in that behalf by the Minister.

(2) Paragraphs (2), (3), (4) and (5) of Rule 22 shall apply to such radiotelephone log-book as they apply to a radiotelegraph log-book, and references in the said paragraphs to a radio officer, a radiotelegraph installation and a radiotelegraph room shall be construed accordingly. Provided that an entry shall be required to be made in the radiotelephone log-book only of the general sense of the messages referred to in sub-paragraph (d) of paragraph (2) of that Rule.

#### PART IV.—TECHNICAL REQUIREMENTS OF RADIO EQUIPMENT FOR LIFEBOATS

Motor lifeboats. Fixed equipment.

31.—(1) The radiotelegraph equipment required by Rule 29 of the Merchant Shipping (Lifesaving Appliances) Rules, 1963, shall comply with the specifications set forth in Part I of the Fifth Schedule hereto.

(2) The battery included in such equipment shall not be used for any purpose other than the operation of such equipment and of the searchlight provided in compliance with the aforesaid Rules.

Motor lifeboats. Portable equipment.

32. The equipment required by paragraph (10) of Rule 6 and paragraph (10) of Rule 7 of the Merchant Shipping (Lifesaving Appliances) Rules, 1963, shall comply with the specifications set forth in Part II of the Fifth Schedule hereto.



33.—(1) When a radiotelegraph ship provided with the equipment referred to in Rule 31 or Rule 32 of these Rules is at sea the radio officer, or if there is more than one, the first radio officer, shall at least once every 7 days cause the transmitter forming part of such installation or equipment to be tested with its artificial aerial and cause any batteries, other than self-priming batteries, which are a source of electrical energy for such installation or equipment to be tested by voltmeter and hydrometer and brought up to fully-charged condition as soon as may be.

Tests.

(2) The radio officer making the tests referred to in paragraph (1) of this Rule shall cause the results of such tests to be entered in the radiotelegraph log-book.

#### PART V.—RADIO DIRECTION-FINDERS

34. This Part of these Rules shall apply to ships, which are—

Application.

(a) sea-going Nigerian ships of 1,600 tons and upwards ;

(b) other sea-going ships of 1,600 tons and upwards while they are within any port in Nigeria,

but they shall not apply to :—

(i) ships not propelled by mechanical means ;

(ii) pleasure yachts ;

(iii) fishing boats, or

(iv) any ship not engaged on an international voyage.

35. Every ship to which this Part applies shall be provided with a direction-finder, complying with the requirements specified in the Twelfth Schedule hereto.

Provision of direction-finders.

36.—(1) The direction-finder required by this Part shall be such that it will be free from mechanical defects and will comply with the requirements of this Part—

Climatic and durability tests.

(a) while undergoing the vibration, dry heat, and low temperature tests specified in the Thirteenth Schedule to these Rules ;

(b) when subjected to the damp heat test specified in the said Schedule ; and

(c) immediately after undergoing the other tests specified in the said Schedule.

(2) The loop aerial system referred to in the Twelfth Schedule to these Rules shall be such that after undergoing the mould growth tests specified in the Thirteenth Schedule to these Rules no mould growth will be present on it.

37. At no time when the ship is at sea shall interference or mechanical noise produced by the direction-finder required by this Part or by any other equipment in the ship be sufficient to prevent the efficient determination of radio bearings by means of the direction-finder.

Interference.

38. All parts and wiring of the equipment specified in this Part in which the direct and alternating voltages (other than radio frequency voltages) combine at any time to give an instantaneous voltage greater than 250 volts shall be protected from accidental access and, except in the case of a generator or converter, shall be isolated automatically from all sources of electrical energy when the means of protection are removed.

High voltage parts.

## Supply of electrical energy.

39. There shall be available in every ship to which this Part applies, whenever she is at sea, a supply of electrical energy sufficient for the operation of the direction-finder. When the ship is in port such supply shall also be available for testing purposes at all reasonable times.

## Charging of batteries.

40. Equipment shall be provided on board every ship to which this Part applies for the charging of any batteries which are provided as a source of electrical energy for the direction-finder, and the ship's main source of electrical energy shall always be available for charging the batteries when the ship is at sea. The master of the ship shall cause such batteries to be tested once a day by voltmeter and once a month by hydrometer, and shall cause any battery which is found not to be fully charged to be brought up to that condition as soon as may be.

## Installation of direction finder.

41.—(1) The direction-finder shall be installed in such a position that efficient determination of radio bearing by means of the direction-finder will not be hindered by extraneous noises.

(2) The loop aerial system referred to in the Twelfth Schedule hereto shall be mounted so that the efficient determination of radio bearing by means of the direction-finder shall be hindered as little as possible by the proximity of aërials, derricks, wire halyards and other large metal objects.

(3) Unless the feeder cables connecting the loop aerial system with the receiver forming part of the direction-finder consist of solid-dielectric screened cable, they shall be protected by metal tubes which are bonded to earth. The joints of the feeder cables shall be watertight.

## Means of communication.

42.—(1) In every ship to which this Part applies an efficient two-way means of calling and voice communication shall be provided between the receiver forming part of the direction-finder and the bridge from which the ship is normally navigated.

(2) In every such ship an efficient means of signalling shall be provided between the receiver forming part of the direction-finder and the ship's standard compass or gyro compass repeater, if any.

## Restriction on use.

43. The direction-finder required by this Part shall not be used—

- (a) for any purpose other than the business of the ship; or
- (b) for keeping the radio watch required by Rule 19 of these Rules.

## Calibration.

44.—(1) The Master of every ship to which this Part applies shall cause the direction-finder required by this Part to be calibrated in accordance with this Rule by two persons, the one experienced in the taking of radio bearings and the other experienced in taking visual bearings.

(2) The direction-finder shall be so calibrated as soon as may be after it has been installed in the ship and whenever any change is made in the position of the loop aerial system.

(3) The direction-finder shall be calibrated in the following manner—

(a) The calibration of the direction-finder shall be carried out by taking simultaneously visual bearings upon a calibrating transmitter and radio bearings thereon by means of the direction-finder, the ship being either,

(i) swung through a complete circle; or

(ii) circled by another ship carrying the calibrating transmitter, and in either case the bearings being taken throughout 360° at intervals of 5 degrees or as close thereto as may be. The calibrating transmitter upon

which the bearings are taken, whether it is situated on shore or on board another ship, shall be a transmitter operating on a frequency between 285 kc/s and 315 kc/s.

(b) Calibration tables and curves shall be prepared on the basis of the bearings taken in accordance with sub-paragraph (a) of this paragraph.

(4) The master of the ship shall cause the calibration tables and curves prepared in accordance with the foregoing provisions of this Rule to be verified by means of check-bearings taken in the manner therein specified.

(a) at intervals not exceeding twelve months ; and

(b) whenever any change is made in any structure or fitting on deck which is likely to affect the accuracy.

If such verification shall show that the calibration tables or curves are materially inaccurate the master of the ship shall cause the direction-finder to be re-calibrated as soon as may be in the manner specified in the foregoing provision of this Rule.

45. The master of every ship to which this Part applies shall cause the following records to be kept on board in a place accessible to any person operating the direction-finder, and to be available for inspection at any reasonable time by a Surveyor of Ships :—

Records of  
calibration  
and  
verification.

(a) a list or diagram indicating the conditions and position, on the most recent occasion on which the direction-finder was calibrated, of—

(i) the aerials, and of

(ii) all moveable structures,

on board the ship which might affect the accuracy of the direction-finder ;

(b) the calibration tables and curves which were prepared on the most recent occasion on which the direction-finder was calibrated ;

(c) a certificate of calibration, in the form specified in the Fourteenth Schedule hereto, relating to the most recent occasion on which the direction-finder was calibrated, and signed by the persons making the calibration ; and

(d) a record, in the form specified in the Fifteenth Schedule hereto, of check-bearings taken for the verification of calibration, the bearings being numbered in the order in which they were taken.

46. A schematic wiring diagram of the direction-finder and a book containing adequate instructions as to the use of the direction-finder shall be provided and shall be available at all times for use by any person operating or testing the direction-finder.

Wiring  
diagram  
and  
instructions.

## FIRST SCHEDULE.

1. As To Rule 5.—Subject to the provisions of paragraph 2 of this Schedule any ship which is provided with radiotelegraph equipment forming part of an existing installation which had been installed before 19th November, 1954, shall not be required to be provided with the equipment specified in the Second Schedule to these Rules if the radiotelegraph equipment provided in the ship complies with:—

(i) such of the requirements of the United Kingdom Merchant Shipping (Wireless Telegraphy) Rules, 1938, as would have been applicable to it if the said Rules had not been revoked, and

(ii) with the requirements set forth in the following table:—

<i>Item</i>	<i>Requirement</i>
(1) The main transmitter and main receiver.	Must together be capable of changing automatically from transmission to reception in the intervals between the morse signals of any transmission.
(2) Main and emergency transmitter.	Must each be modulated to a depth of not less than 70 per cent.
(3) Main transmitter.	Must be capable of:— <ul style="list-style-type: none"> <li>(a) transmitting type A2 waves on frequencies of either,               <ul style="list-style-type: none"> <li>(i) 410 kc/s, 500 kc/s and 512 kc/s and on any two of the frequencies 425 kc/s, 454 kc/s, 468 kc/s and 480 kc/s; or</li> <li>(ii) in any case in which the Minister so permits 410 kc/s, 500 kc/s and on one of the frequencies 425 kc/s, 454 kc/s, 480 kc/s and 512 kc/s.</li> </ul> </li> <li>(b) maintaining throughout the period of 10 minutes from the commencement of transmission a frequency tolerance not exceeding plus or minus 0.3 per cent; and</li> <li>(c) maintaining throughout every transmission a frequency tolerance not exceeding plus or minus 0.1 per cent.</li> </ul>
(4) Emergency transmitter.	Must be capable of:— <ul style="list-style-type: none"> <li>(a) transmitting type A2 waves on a frequency of 500 kc/s;</li> <li>(b) maintaining a frequency tolerance throughout every transmission not exceeding plus or minus 0.5 per cent subject to the provisions of paragraph 15 of this Schedule.</li> </ul>
(5) Main receiver	(a) Must be capable of:— <ul style="list-style-type: none"> <li>(i) producing signals in head phones when the receiver input is as low as 100 microvolts.</li> <li>(ii) receiving type A1 waves on all frequencies from 15 kc/s to 20 kc/s and from 100 kc/s to 160 kc/s; and</li> </ul>

(iii) receiving type A1 and A2 waves on all frequencies either :—

(i) from 160 kc/s to 25,000 kc/s or

(ii) in cases in which the Minister so permits, from 160 kc/s to 4,000 kc/s.

(b) Must be such that the radiation from the receiver does not exceed 0.1 microvolt per metre when measured at a distance of one mile from the receiver or when tested in the manner set forth in sub-paragraph (2) of paragraph 16 of Part II of the Second Schedule to these Rules.

(6) Emergency receiver

(a) Must be capable of :—

(i) producing signals by means of a loud-speaker when the receiver input is as low as 100 microvolts ;

(ii) receiving type A2 and type B waves on a frequency of 500 kc/s,

(b) Must be such that the radiation from the receiver does not exceed 0.1 microvolt per metre when measured at a distance of one mile from the receiver, or when tested in the manner set forth in sub-paragraph (2) of paragraph 15 of Part IV of the Second Schedule to these Rules.

(1) Transmitter (a) Must be capable of :—

(i) transmitting type A3 waves on the radiotelephone distress frequency and at least 4 other frequencies within the band 1,600 kc/s to 2,850 kc/s ;

(ii) maintaining throughout the period of 10 minutes from the commencement of transmission a frequency tolerance not exceeding plus or minus 0.05 per cent ; and

(iii) maintaining throughout every transmission a frequency tolerance not exceeding plus or minus 0.02 per cent.

(b) Must be modulated to a depth of not less than 70 per cent at peak intensity in normal operation.

(2) Receiver (a) Must be capable of :—

(i) receiving type A3 waves on all frequencies from 1,600 kc/s to 2,850 kc/s.

(ii) producing signals both in head-phones and by means of a loud-speaker when the receiver input does not exceed 50 microvolts ; and

(b) Must be such that radiation from the receiver does not exceed 0.1 microvolt per metre when measured at a distance of one mile from the receiver or when tested in the manner set forth in sub-paragraph (14) (b) of paragraph 6 of the Third Schedule to these Rules.



4. AS TO RULE 6.—Nothing in Rule 6 of these Rules shall apply to equipment which is part of an existing installation, or to equipment, being equipment referred to in paragraph 1 or paragraph 4 of this Schedule, which had been installed before 19th November, 1954.

5. AS TO RULE 8.—Nothing in paragraph (1) of Rule 8 of these Rules shall require any parts or wiring in an existing installation to be isolated automatically from all sources of electrical energy when the means of protection referred to therein are removed.

6. AS TO RULE 6, RULE 17 AND RULE 19.—Nothing in Rule 6, Rule 17 or Rule 19 of these Rules shall apply to any auto-alarm which complies with such of the requirements of the United Kingdom Merchant Shipping (Wireless Telegraphy) Rules, 1938, as would have been applicable to it if the said Rule had not been revoked. Provided that the radiation from the auto-alarm receiver shall not exceed 0.1 microvolt per metre when measured at a distance of one mile from the auto-alarm, or when tested in the manner set forth in sub-paragraph (10) (a) of paragraph 2 of the Seventh Schedule to these Rules.

7. AS TO RULE 31.—

(a) Any existing radiotelegraph installation in a motor lifeboat, and

(b) Any radiotelegraph installation installed in a motor lifeboat before 19th November, 1954,

which complies with such of the requirements of the United Kingdom Merchant Shipping (Life Saving Appliances) Rules, 1948, as would have been applicable to it if the said Rules had not been revoked shall be treated as complying with the requirements specified in Part I of the Fifth Schedule to these Rules if it includes the equipment specified in the following sub-paragraphs:

(1) A copper earth connection, connected by at least three independent bolted connections to the hull in the case of a metal lifeboat or to a bare copper earthplate of area at least six square feet fitted below the water line in the case of a wooden lifeboat.

(2) A transmitter which is:

(a) modulated to a depth of not less than 70 per cent;

(b) capable of:

(i) transmitting either type A2 or type B waves on a frequency of 500 kc/s;

(ii) transmitting type A2 waves on a frequency of 500 kc/s;

(iii) maintaining throughout every transmission on that frequency a frequency tolerance not exceeding plus or minus 0.5 per cent;

(iv) transmitting over a normal range of 25 miles determined in the manner prescribed by Rule 43 of these Rules;

(v) transmitting the alarm signal and the distress signal by means of an automatic keying device; and

(c) if installed on or after 19th November, 1953 is capable of:—

(i) transmitting type A2 waves on a frequency of 8,364 kc/s, and

(ii) maintaining throughout every transmission on that frequency a frequency tolerance not exceeding plus or minus 0.02 per cent.

8. AS TO RULE 32.—Any portable radiotelegraph equipment for lifeboats provided before 19th November, 1953, in a ship to which these Rules apply which complies with such of the requirements of the (United Kingdom Merchant Shipping (Life-Saving Appliances) Rules, 1948, as would have been applicable to it if the said Rules had not been revoked shall be treated as complying with the requirements specified in Part II of the Fifth Schedule to these Rules if the transmitter forming part of such equipment complies with the requirements specified in the following sub-paragraphs.

the transmitter shall:—

- (a) be modulated to a depth of not less than 70 per cent;
- (b) have an input of at least 10 watts to the anode of the final stage;
- (c) be capable of:—
  - (i) transmitting type A2 waves on a frequency of 500 kc/s;
  - (ii) maintaining throughout every transmission a frequency tolerance not exceeding plus or minus 0.5 per cent and
  - (iii) transmitting the alarm signal and distress signal by means of an automatic keying device.

## SECOND SCHEDULE

(Rule 5 (1))

### RADIOTELEGRAPH EQUIPMENT

#### PART I.—MAIN RADIOTELEGRAPH TRANSMITTER

1. GENERAL.—The main radiotelegraph transmitter (in this Part of this Schedule referred to as "the transmitter") shall be provided with any equipment which may be necessary to enable it to be operated from the supply of energy referred to in paragraph (1) of Rule 14 of these Rules, and shall be capable of being quickly connected with the main and emergency aerials referred to in Rule 12 of these Rules.

2. TYPES OF WAVES AND FREQUENCY RANGE.—The transmitter shall be capable of adjustment for the transmission of both type A1 and A2 waves as may be required in the frequency range 405 kc/s to 525 kc/s.

3. TRANSMITTING FREQUENCIES.—The transmitter shall be capable of transmitting continuously but not simultaneously, radiotelegraph signals on the frequencies of 500 kc/s, 410 kc/s and 512 kc/s and on two of the following frequencies:

425 kc/s, 454 kc/s, 468 kc/s and 480 kc/s.

4. RANGE OF LOAD IMPEDANCE.—The transmitter shall be capable of complying with all the requirements of this Part of this Schedule when connected to an artificial load, one side of which is earthed, consisting of a resistance of value R in series with a capacitance of value C in all of the combinations specified in the following table:—

C.	300	400	500	600	750	Picofarads
R.	3.6	2.8	2.2	1.9	1.9	ohms

5. POWER OF TRANSMITTER.—(1) For the purposes of this paragraph the expression "the power of the transmitter" means the total power developed in the artificial load specified in paragraph 4 of this Part of this Schedule during a period when the transmitting key is depressed and does not include power dissipated in any component forming part of the transmitter.

(2) The maximum power of the transmitter shall not be less than W watts at any frequency within its range, W being determined by the formula :—

$$W = \frac{100}{1 + \frac{500}{f}}$$

where f is the frequency in kilocycles per second at which the test is made.

(3) The transmitter shall be so designed that its power can be reduced, either continuously or in steps of not more than six decibels, to a power between 2 watts and 9 watts.

(4) When adjusted to develop its maximum rated power the transmitter shall be capable of :—

(a) continuous operation for the transmission of radiotelegraph signals at any speed up to the maximum specified in paragraph 8 of this Part of this Schedule ; and

(b) operation under steady marking or spacing conditions for a period of not less than fifteen minutes.

6. DEPTH OF MODULATION.—The depth of modulation when the transmitter is transmitting type A2 waves shall be :—

(1) not less than 80 and not more than 95 per cent when the power of the transmitter is 25 watts or more.

(2) not less than 70 and not more than 95 per cent when the power of the transmitter is less than 25 watts.

7. NOTE FREQUENCY.—The note frequency of the transmitter shall not be less than 500 and not more than 1,200 c/s.

8. SPEED OF TRANSMISSION.—The transmitter shall be capable of transmitting telegraph signals at all speeds up to 30 bauds without critical relay adjustment.

9. FREQUENCY STABILITY.—The transmitter shall be capable of maintaining a frequency tolerance of plus or minus 0.1 per cent throughout every transmission without adjustment of controls, notwithstanding variations of the impedance of the aerial or any other load to which it is connected, or variations of supply voltage within plus or minus 10 per cent.

10. SPURIOUS AND HARMONIC COMPONENTS IN THE OUTPUT SIGNAL.—

(1) The radio-frequency output of the transmitter shall be entirely free from frequency components due to spurious oscillations in any part of the transmitter.

(2) The maximum power output of the transmitter at any harmonic of the radio frequency shall not exceed 20 milliwatts, whether type A1 or type A2 waves are being transmitted;

(3) When the transmitter is transmitting dots at a speed of 30 bauds, 95 per cent of the total power radiated from the transmitter shall be radiated within plus or minus 100 c/s of the steady state carrier frequency for type A2 waves.

11. OPERATING FACILITIES.—(1) The transmitter shall be so arranged that the adjustments necessary to change it from operation on any one of the frequencies required by paragraph 3 of this Part of this Schedule to operation on any other of such frequencies can be made by one operator in a period not exceeding 10 seconds.

(2) The transmitter shall be capable of being operated on full power within 60 seconds after any part of the transmitter has been first switched on.

(3) If the transmitter is so designed and constructed that it is necessary to delay the application of certain voltages for a period after it has been switched on, the delay shall be automatically provided for by a delay switch.

(4) The transmitter shall be provided with a device which, when the transmitting key is not depressed, automatically brings into operation the main radiotelegraph receiver in conjunction with which the transmitter is operated. Means shall be provided for suppressing interference with reception caused by the transmitter.

(5) The transmitter shall be capable of being used in conjunction with an automatic keying device.

12. PROTECTIVE ARRANGEMENTS.—The transmitter shall be so designed and constructed that when the transmitting key is depressed the aerial can be disconnected or the output can be short-circuited without damage being caused to any part of the transmitter. Means shall be provided for protecting the transmitter from damage caused by excessive current or voltage.

13. CRYSTAL HOLDERS.—If the transmitter is designed for use with piezo-electric crystals it shall be suitable for use with a crystal holder complying with one of the following specifications :—

(a) a holder in the form of a rectangular parallelepiped surmounted by two projecting pins, such pins being :—

(i) situated symmetrically with respect to the width and depth of the rectangular parallelepiped ;

(ii) 0.125 inches in diameter, subject to a tolerance of plus or minus 0.002 inches ;

(iii) spaced 0.75 inches apart, subject to a tolerance of plus or minus 0.005 inches.

(iv) 0.56 inches in length, subject to a tolerance of plus or minus 0.005 inches ; and

(v) rounded at the ends.

Such parallelepiped shall be :—

1.81 inches in height, subject to a tolerance of plus 0.005 inches, or minus 0.015 inches.



1.6 inches in width, subject to a tolerance of minus 0.01 inches, and 0.75 inches in depth, subject to a tolerance of minus 0.01 inches, or

(b) a holder in the form of a rectangular parallelepiped surmounted by two projecting pins, such pins being :—

(i) situated symmetrically with respect to the width and depth of the rectangular parallelepiped ;

(ii) 0.125 inches in diameter, subject to a tolerance of plus or minus 0.002 inches.

(iii) spaced 0.5 inches apart subject to a tolerance of plus or minus 0.002 inches.

(iv) 0.56 inches in length, subject to a tolerance of plus or minus 0.005 inches ; and

(v) rounded at the ends.

Such parallelepiped shall be :—

1.34 inches in height, subject to a tolerance of plus 0.005 inches, or minus 0.015 inches.

1.18 inches in width, subject to a tolerance of minus 0.1 inches.

0.455 inches in depth, subject to a tolerance of minus 0.1 inches.

14. ARTIFICIAL AERIAL.—An artificial aerial shall be provided which shall include an indicator or lamp to indicate the passage of radio-frequency currents, and shall be suitable for testing the transmitter on full power.

15. METER.—The transmitter shall be provided with an aerial ammeter.

## PART II.—MAIN RADIOTELEGRAPH RECEIVER

1. GENERAL.—The main radiotelegraph receiver (in this Part of this Schedule referred to as "the receiver") may consist of a single unit or of separate units, each of which is capable of reception on one or more of sections of the frequency range specified in paragraph 2 of this Part of this Schedule, and shall be capable of being quickly connected with the main and emergency aerials referred to in Rule 12 of these Rules.

(2) Each unit of the receiver shall bear a plate stating the frequency range it is intended to cover.

(3) The receiver shall not be constructed for operation in whole or in part from energy supplied by dry batteries.

2. FREQUENCY RANGE AND TYPES OF WAVES.—The receiver shall be capable of receiving signals within the frequency ranges and of the types specified in the following table :

Frequency range	Type of wave
15 to 20 kc s (inclusive)	A1
100 to 160 kc s	A1
160 to 1,500 kc s	A1, A2, B
1.5 to 4 Mc s	A1, A2, A3
4 to 25 Mc s	A1, A2, A3



3. RECEPTION FACILITIES.—The receiver shall be capable of headphone reception throughout the frequency ranges specified in Paragraph 2 of this Part of this Schedule.

4. CONTROLS.—The receiver shall be provided with :—

- (1) separate radio-frequency and audio-frequency gain controls ;
- (2) a means for reducing the receiver gain when the transmitting key of the transmitter is depressed, so that signals may be heard without inconvenience to the operator or damage to the receiver when the transmitter is keyed at signalling speeds up to 30 words per minute ;
- (3) a switch for disconnecting the device, if any, for reducing the effect of impulsive noise signals ;
- (4) tuning controls which permit :
  - (a) rapid tuning throughout the frequency range ; and
  - (b) fine tuning by bandspread or other method, controlled by a knob of at least two inches diameter, the backlash of which shall not exceed one degree, and which shall be so geared that, after any backlash has been taken up, a rotation of one degree will not change the frequency of tune by more than the amount indicated in the following table :

<i>Frequency range</i>	<i>Change of frequency per degree : Parts in 10<sup>4</sup></i>
15 kc/s to 1.5 Mc/s	3
1.5 Mc/s to 25 Mc/s	1

(5) accurate means of resetting tune ; if a logging scale is provided for that purpose one inch on the scale shall correspond to a frequency change of not more than one per cent ;

(6) a scale for use with the means of rapid tuning referred to in subparagraph (4) (a) of this paragraph ; the scale shall be calibrated directly in frequency unless calibration charts are provided for use therewith.

5. GENERAL METHOD OF TESTING.—The receiver shall comply with the requirements of paragraphs 6 to 17, inclusive, of this Schedule, when tested in the following manner, except where another manner of testing is specified in the said paragraphs :

(1) An artificial aerial shall be used for the test and shall consist of a 75 ohm non-inductive resistor if the test is conducted at frequencies above 4 Mc/s, and a 10 ohm resistor in series with a capacitor having any value between 200 and 600 picofarads if the test is conducted at frequencies below 4 Mc/s.

(2) Type A2 signals used in the test shall be modulated to a depth of 30 per cent and shall have a note frequency of 400 c/s.

(3) The frequency of the interfering or unwanted signals applied shall not be restricted to the frequency range of the receiver.

(4) The standard audio-frequency output level of the receiver for headphone reception (hereafter in this Part of this Schedule referred to as "the standard output") shall be one milliwatt into a resistance substantially equal to the modulus of the impedance of the telephone receivers at 1000 c/s.

6. SELECTIVITY.—(1) Subject to the provisions of sub-paragraph (3) of this paragraph the selectivity preceding the final detector of the receiver shall be variable, either continuously or in steps and shall satisfy the following requirements throughout the frequency ranges specified :—

<i>Bandwidth setting</i>	<i>Wide</i>	<i>Inter- mediate</i>	<i>Narrow</i>	<i>Very narrow</i>
Frequency range	1.5 Mc/s to 25 Mc/s	160 kc/s to 25 Mc/s	15 kc/s to 25 Mc/s	15 kc/s to 160 kc/s
Discrimination of not more than 6 decibels to be obtained at frequencies removed from tune by	4 kc/s	1.5 kc/s	0.5 kc/s (does not apply below 100 kc/s)	—
Discrimination of at least 30 decibels to be obtained at all frequencies removed from tune by	12 kc/s	6 kc/s	2.5 kc/s	0.75 kc/s
Discrimination of at least 60 decibels to be obtained at all frequencies removed from tune by	24 kc/s	12 kc/s	5 kc/s	5 kc/s
Discrimination of at least 90 decibels to be obtained at all frequencies removed from tune by	50 kc/s	35 kc/s	25 kc/s	25 kc/s
Provided that the discrimination against an interfering signal of frequency greater than 1.5 Mc/s need not exceed 60 decibels.				

(2) If the receiver is a superheterodyne receiver :—

(a) the image response ratios thereof shall not be less than the following :

<i>Frequency of wanted signals</i>	<i>Image response ratio</i>
15 to 1,000 kc/s	80 decibels
1 to 1.5 Mc/s	70 decibels
1.5 to 7 Mc/s	60 decibels
7 to 15 Mc/s	40 decibels
above 15 Mc/s	25 decibels.

(b) the intermediate frequency response ratios thereof shall not be less than the following :—

<i>Intermediate frequency</i>	<i>Intermediate frequency response ratio</i>
Between 140 and 1,600 kc/s	90 decibels
Outside the above limits	60 decibels

(3) Notwithstanding the provisions of sub-paragraph (1) of this paragraph the very narrow bandwidth setting of the receiver may be provided by an audio-frequency note filter which shall have :—

(a) a midband frequency of one kilocycle per second,

(b) a discrimination of at least 20 decibels at all frequencies outside a band 700 c/s wide,

and shall be capable of being switched in or out of circuit at will.

7. SENSITIVITY.—The standard output of the receiver shall be obtained at all bandwidth settings, and with the automatic gain control both on and off, with an input not exceeding the following levels :—

Frequency	Maximum input for type A1 waves	Maximum input type A2 waves
15—160 kc/s .. .. .	30 decibels above one microvolt.	Does not apply.
160—1,500 kc/s .. .. .	20 decibels above one microvolt.	30 decibels above one microvolt.
1.5—10 Mc/s .. .. .	10 decibels above one microvolt.	20 decibels above one microvolt.
10—25 Mc/s .. .. .	20 decibels above one microvolt.	30 decibels above one microvolt.

8. SIGNAL/NOISE RATIO.—(1) The signal/noise ratio of the receiver shall not be less than the ratio specified in the following table, when receiving any signal being either a type A1 signal or a type A2 signal, of the maximum input specified in paragraph 7 of this Part of this Schedule when the receiver gain is adjusted to give the standard output and the note filter, if any, is switched out of circuit :—

Frequency	Bandwidth setting	Signal/noise ratio
15-160 kc/s .. .. .	Narrow .. .. .	10 decibels
160-1,500 kc/s .. .. .	Intermediate .. .. .	10 decibels
1.5-4 Mc/s .. .. .	Wide .. .. .	10 decibels
4-10 Mc/s .. .. .	Wide .. .. .	20 decibels
10-25 Mc/s .. .. .	Wide .. .. .	25 decibels

(2) For the purposes of this paragraph spurious whistles shall be regarded as noise.

9. AUTOMATIC GAIN CONTROL.—(1) The receiver shall be provided with an automatic gain control, capable of operating efficiently on types A1, A2 and A3 waves of all frequencies between 1,500 kc/s and 25 Mc/s, and which can be switched out of circuit.

(2) When the receiver is adjusted to give the standard output with a type A2 input signal 10 decibels above the appropriate maximum input specified in paragraph 7 of this Part of this Schedule on any frequency between 1.5 and 25 Mc/s :—

(a) an increase in input of 20 decibels shall result in an improvement in the signal/noise ratio of at least 15 decibels, and

(b) an increase in input of 60 decibels shall not increase the output by more than 10 decibels.

- (3) The charge time constant of the automatic gain control system shall be between .05 and .2 seconds and the discharge time constant thereof shall be between 0.5 and 2 seconds.

10. OUTPUT LIMITING. An increase in the input to the receiver by 60 decibels when :—

- (1) the automatic gain control is switched off, and
  - (2) the receiver is adjusted to give the standard output with a type A1 input signal 20 decibels above the appropriate maximum input specified in paragraph 7 of this Part of this Schedule,
- shall not increase the output by more than 10 decibels.

11. BLOCKING. The change in the output of the receiver shall not exceed 3 decibels when :—

- (a) (i) the bandwidth is set at "intermediate",
- (ii) the automatic gain control is in operation,
- (iii) the receiver is adjusted to give the standard output with an input wanted signal of type A2 at a level of 60 decibels above one microvolt and of any frequency between 160 kc/s and 25 Mc/s, and
- (iv) a type A1 input signal at a level of 100 decibels above one microvolt and at a frequency 10 kc/s above or below the wanted frequency is then simultaneously applied ; or
- (b) (i) the bandwidth is set at "narrow",
- (ii) the automatic gain control is switched off,
- (iii) the receiver is adjusted to give the standard output with an input wanted signal of type A1 at a level 30 decibels above one microvolt and of any frequency between 15 and 160 kc/s, and
- (iv) a type A1 input signal of a level of 70 decibels above one microvolt and at a frequency 5 kc/s above or below that of the wanted frequency is then simultaneously applied.

12. CROSS MODULATION.—The receiver shall not produce an output of level higher than 30 decibels below the standard output when :—

- (1) the bandwidth is set at "intermediate",
- (2) the automatic gain control is in operation,
- (3) the receiver is adjusted to give the standard output with an input wanted signal of type A2 at a level of 60 decibels above one microvolt and of any frequency between 160 kc/s and 25 Mc/s.
- (4) the modulation of the signal is switched off, and
- (5) a type A2 input signal of level 90 decibels above one microvolt and frequency 10 kc/s above or below the wanted frequency is then simultaneously applied.

13. INTERMODULATION AND HARMONIC PRODUCTION.—An output exceeding the standard output shall not be produced by the receiver when :—

- (a) (i) the bandwidth is set at "intermediate",
- (ii) the automatic gain control is switched off,



- (iii) the receiver is adjusted to give the standard output with an input wanted signal of type A2 at a level 30 decibels above one microvolt and at any frequency between 160 kc/s and 550 kc/s,
  - (iv) the input wanted signal has been removed, and
  - (v) any two interfering signals one of type A1 and the other of type A2 each of a level 110 decibels above one microvolt and of such frequency as to give no appreciable output, when applied alone and of which the frequency difference or frequency sum is the same as the frequency of the wanted signal, are then simultaneously applied; or
- (b)—(i) the bandwidth is set at "intermediate",
- (ii) the automatic gain control is switched off,
  - (iii) the receiver is adjusted to give the standard output with an input wanted signal of type A2 at a level 30 decibels above one microvolt and at any frequency between 280 kc/s and 550 kc/s,
  - (iv) the input wanted signal has been removed, and
  - (v) a type A2 signal, the frequency of which is half that of the wanted signal and at a level 116 decibels above one microvolt is applied.

14. FIDELITY.—The maximum change in level of the output of the receiver shall be less than eight decibels while the modulation frequency of an input signal of constant level and modulation depth is varied continuously from 300 c/s to 2,500 c/s when the bandwidth is set at "wide" for the reception of type A3 waves having a frequency above 1,500 kc/s. The receiver shall comply with the foregoing requirements when the level and modulation depth of the input signal are such that the output of the receiver does not exceed the standard output.

15. NON-LINEAR DISTORTION.—With the automatic gain control switched on, the total harmonic content of the audio-frequency output of the receiver at any output not exceeding the standard output shall not exceed:

- (1) 5 per cent with an input signal of a frequency of one megacycle per second at any level between 30 decibels and 80 decibels above one microvolt and sinusoidally modulated to a depth of 30 per cent at 400 c/s.
- (2) 15 per cent with such input signal modulated to a depth of 80 per cent at 400 c/s.

16. TUNING DRIFT AND STABILITY.—The tuning drift and stability of the receiver shall comply with the following requirements:

- (a) After the receiver has been switched on for 5 minutes the changes of tune frequency during any period of 5 minutes shall not exceed the value shown in the second column of the following table within the frequency ranges shown in the first column thereof:

Frequency ranges	Maximum change (parts in $10^3$ )
15 kc/s to 1.5 Mc/s	3
1.5 Mc/s to 25 Mc/s	1

(b) A change of 5 per cent in any one of the supply voltages to the receiver shall not produce a maximum change of tune frequency exceeding the value shown in the second column of the following table within the frequency ranges shown in the first column thereof :—

<i>Frequency ranges</i>	<i>Maximum change (parts in 10<sup>4</sup>)</i>
15 kc/s to 1.5 Mc/s .. .. .	3
1.5 Mc/s to 25 Mc/s .. .. .	-1

(c) A change in ambient temperature of -5°C. within the range of 0° to 50° C. applied after the receiver has been switched on for one hour shall not produce a maximum change of tune frequency exceeding the value shown in the second column of the following table within the frequency ranges shown in the first column thereof :—

<i>Frequency ranges</i>	<i>Maximum change (parts in 10<sup>4</sup>)</i>
15 kc/s to 1.5 Mc/s .. .. .	10
1.5 Mc/s to 25 Mc/s .. .. .	3

17. HETERODYNE NOTE STABILITY.—The heterodyne note stability of the receiver shall be such that :—

(1) the frequency, of a heterodyne note which is initially one kilocycle per second shall not vary by more than 100 c/s when the appropriate input level specified in sub-paragraph (2) of paragraph 10 of this Part of this Schedule is increased by not more than 60 decibels,

(2) it is possible at all input levels within the range specified in sub-paragraph (1) of this paragraph, to obtain a beat note of 200 c/s when tuning either towards or away from zero beat.

18. RADIATION.—(1) The receiver when in use shall not produce a field exceeding 0.1 microvolt per metre, when measured at a distance of one mile from the receiver.

(2) The receiver shall be deemed to comply with the requirement of sub-paragraph (1) of this paragraph if, when :—

(a) the receiver is placed centrally in a screened earthed enclosure of dimensions at least six feet cube,

(b) the earth terminal of the receiver is connected to the inside of the screen,

(c) the aerial terminal is connected through an unscreened four-turn rectangular search coil situated within the said enclosure and of dimensions one foot square and an unscreened lead to a resistive measuring instrument mounted outside the enclosure and having its other terminal earthed, and

(d) the receiver is then energised and unscreened headphones are connected thereto, the power measured by the measuring instrument does not exceed  $4 \times 10^{-10}$  watts whatever the resistance of the measuring instrument or the adjustments of the receiver, notwithstanding that the search coil be short circuited or moved in any way, provided that it does not approach within six inches of the receiver case.

## PART III.—EMERGENCY RADIOTELEGRAPH TRANSMITTER

1. GENERAL.—The emergency radiotelegraph transmitter (in this Part of this Schedule referred to as "the transmitter"), shall be provided with all equipment necessary to enable it to operate from the emergency source of energy referred to in paragraph (2) of Rule 14 of these Rules, and shall be capable of being quickly connected with the main and emergency aerials referred to in Rule 12 of these Rules.

2. TYPES OF WAVES AND FREQUENCY RANGE.—The transmitter shall be capable of transmitting continuously type A2 waves on the frequency of 500 kc/s.

3. SOURCE OF ENERGY.—(1) The transmitter shall be capable of operation from the emergency source of energy referred to in paragraph (2) of Rule 12 of these Rules.

(2) If a vibrator power unit is employed, a standby vibrator, arranged in such manner that it may be immediately switched into circuit, shall be provided.

4. RANGE OF LOAD IMPEDANCE.—When connected to an artificial load, one side of which is earthed, consisting of a resistance of value R in series with a capacitance of value C, the transmitter shall meet the requirements of this Part of this Schedule with all the combinations of R and C specified in the following table :—

C	250	300	400	500	600	750	Picofarads
R	4	3.6	2.8	2.2	2	1.9	Ohms

5. POWER OF TRANSMITTER.—(1) For the purposes of this paragraph the power of the transmitter shall be taken to be the mean power developed in the artificial load during a period when the transmitting key is depressed, and shall not include power dissipated in any component forming part of the transmitter.

(2) The power of the transmitter shall not be less than 15 watts when the source of energy is developing 90 per cent of its rated voltage.

(3) When adjusted to develop its maximum power, the transmitter shall be capable of :—

(a) continuous operation for the transmission of telegraph signals at any speed up to the maximum specified in paragraph 8 of this Part of this Schedule;

(b) operation under steady marking or steady spacing conditions for a period of not less than 15 minutes.

6. MODULATION.—(1) The carrier wave shall be modulated to a depth of not less than 75 per cent and not more than 100 per cent.

(2) The harmonic content of the modulating envelope shall not exceed 30 per cent.

7. NOTE FREQUENCY.—The note frequency of the transmitter shall not be less than 500 c/s or more than 1,200 c/s.

8. SPEED OF TRANSMISSION.—The transmitter shall be capable of transmitting telegraph signals at all speeds up to 25 bauds without critical adjustment of relays.

9. FREQUENCY STABILITY.—The transmitter shall be capable of maintaining a frequency tolerance of plus or minus 0.5 per cent throughout every transmission without adjustment of controls notwithstanding variations of the impedance of the aerial or of any other load to which it is connected, or variation of supply voltage within plus or minus 10 per cent.

10. OPERATING FACILITIES.—(1) The transmitter shall be capable of being operated on full power within six seconds after it has been switched on.

(2) The transmitter shall be capable of being used in conjunction with the automatic keying device specified in Part V of this Schedule.

11. PROTECTIVE ARRANGEMENTS.—The transmitter shall be so designed and constructed that when the transmitter is adjusted to develop its maximum power and when the transmitting key is depressed the aerial can be disconnected or the output can be short-circuited without damage being caused to any part of the transmitter.

12. CRYSTAL HOLDERS.—If the transmitter is designed for use with piezo-electric crystals it shall be suitable for use with a crystal holder specified in paragraph 13 of Part 1 of this Schedule.

13. ARTIFICIAL AERIAL.—An artificial aerial shall be provided which shall include an indicator or lamp to indicate the passage of radio-frequency currents and shall be suitable for testing the transmitter on full power.

14. METER.—The transmitter shall be provided with an aerial ammeter.

15. USE FOR NORMAL COMMUNICATIONS.—If the transmitter is used otherwise than in an emergency or for the test required by paragraph (4) (b) of Rule 20, paragraphs 3, 6, 8, 9, 10 and 11 of Part 1 of this Schedule shall apply in relation to it as they apply in relation to the main transmitter.

#### PART IV. EMERGENCY RADIOTELEGRAPH RECEIVER

1. GENERAL.—The emergency radiotelegraph receiver (in this Part of this Schedule referred to as "the receiver"), unless it is a receiver forming part of an auto-alarm which complies with paragraph 7 of the Seventh Schedule to these Rules, shall be capable of being rapidly connected to the emergency aerial referred to in Rule 12 of these Rules.

2. FREQUENCY RANGE AND TYPES OF WAVES.—Subject to the provisions of paragraph 3 of this Part of this Schedule, the receiver shall be capable of receiving type A2 waves and type B waves in each case throughout the frequency range 488 kc/s to 513 kc/s, and for that purpose a wide band-pass shall be provided.

3. RECEPTION FACILITIES.—The receiver shall be capable of headphone reception and loud-speaker reception throughout the frequency range specified in paragraph 2 of this Part of this Schedule, unless two emergency receivers are provided, one of which is capable of headphone reception, with or without tuning, throughout the said range and the other of which is capable of loud-speaker reception throughout the said range without tuning.



4. SOURCE OF ENERGY:—(1) The receiver shall be capable of operation both from the main source of electrical energy required by paragraph (1) of Rule 14 of these Rules and the emergency source of electrical energy required by paragraph (2) of that Rule. Provided that if the ship is equipped with two emergency receivers as aforesaid, the receiver capable of loud-speaker reception shall be required to be capable of operation only from the said main source of electrical energy.

(2) The receiver shall comply with the requirements of paragraphs 7 to 15 inclusive of this Part of this Schedule notwithstanding variations in the supply voltage within the range:—

(i) plus 5 per cent and minus 10 per cent of the nominal voltage when operated from the emergency source of electrical energy required by paragraph (2) of Rule 14 of these Rules and

(ii) plus and minus 10 per cent of the nominal voltage when operated from the main source of electrical energy required by paragraph (1) of Rule 14 of these Rules.

5. CONTROLS.—The receiver shall be provided with:—

(1) a manual gain control;

(2) if only a single emergency receiver is provided, a switch for changing the receiver from operation from the main source of electrical energy referred to in paragraph (1) of Rule 14 of these Rules to the emergency source of electrical energy referred to in paragraph (2) of that Rule; and

(3) if the receiver is designed to tune to frequencies additional to the frequency range specified in paragraph 2 of this Part of this Schedule, a switch for changing reception to the frequency range referred to in that paragraph.

6. METHOD OF TESTING.—The receiver shall comply with paragraphs 7 to 15 inclusive of this Part of this Schedule when tested in the following manner except where another manner of testing is specified in the said paragraphs:—

(1) An artificial aerial shall be used for the test and shall consist of a 10 ohm resistor in series with a capacitor having any value between 200 and 600 picofarads.

(2) Type A2 signals used in the test shall be modulated to a depth of 30 per cent and shall have a note frequency of 400 c/s.

(3) The standard audio-frequency output level (hereafter in this Part of this Schedule referred to as "the standard output") of the receiver shall be:—

(a) for headphone reception 10 decibels below one milliwatt into a resistance substantially equal to the modulus of the impedance of the telephone receivers at 1,000 c/s, and

(b) for loud-speaker reception 17 decibels above one milliwatt into a resistance that loads the output valve with the load appropriate to the valve.

7. SELECTIVITY—(1) Subject to the provisions of sub-paragraph (2) of this paragraph, the selectivity preceding the final detector of the receiver shall, if it is provided with a wide band-pass, satisfy the following requirements at the relative frequencies specified:—

(a) not more than 4 decibels discrimination relative to the maximum response at frequencies between 488 and 513 kc/s inclusive;

(b) at least 30 decibels discrimination relative to the maximum response at frequencies below 475 kc/s and above 525 kc/s ;

(c) at least 60 decibels discrimination relative to the maximum response at frequencies below 450 kc/s and above 550 kc/s and

(d) at least 90 decibels discrimination relative to the maximum response at frequencies below 400 kc/s and above 600 kc/s.

(2) If the receiver is a superheterodyne receiver the intermediate frequency response ratio shall not be less than 60 decibels provided that the intermediate frequency is outside the limits 140 kc/s and above 1,600 kc/s.

(3) If any emergency receiver, being a receiver capable of headphone reception is tunable over the frequency range specified in paragraph 2 of this Part of this Schedule, the selectivity preceding the final detector at all frequencies within the said range shall satisfy the requirements set forth in the following table :—

Discrimination	Corresponding Bandwidth
10 decibels	Not less than 4 kc/s
30 decibels	No greater than 50 kc/s
60 decibels	No greater than 100 kc/s
Greater than 60 decibels	Greater than 100 kc/s

8. SENSITIVITY.—The standard output shall be obtained with an input signal of type A2 not exceeding 40 decibels above one microvolt.

9. Signal Noise Ratio.—The signal/noise ratio, with an input signal of type A2 of 40 decibels above one microvolt and when the manual gain control is adjusted to give the standard output, shall not be less than 20 decibels.

10. BLOCKING.—If the receiver is intended for loudspeaker reception the change in the output of the receiver shall not exceed 3 decibels when :—

(1) the receiver is adjusted to give the standard output with an input wanted signal of type A2 at a level of 60 decibels above one microvolt and of a frequency of 500 kc/s and

(2) a type A1 input signal at a level of 100 decibels above one microvolt and of a frequency of 440 kc/s or 560 kc/s is then simultaneously applied.

11. CROSS MODULATION.—If the receiver is intended for loudspeaker reception, the receiver shall not produce an output of level higher than 30 decibels below the standard output when :—

(1) the receiver is adjusted to give the standard output with an input wanted signal of type A2 at a level of 60 decibels above one microvolt and of a frequency of 500 kc/s.

(2) the modulation of the signal is switched off, and

(3) a type A2 at a level of 90 decibels above one microvolt and of a frequency of 425 kc/s or 575 kc/s is then simultaneously applied.

12. INTERMODULATION AND HARMONIC PRODUCTION.—If the receiver is intended for loudspeaker reception an output exceeding the standard output shall not be produced by the receiver when :—

(1) the receiver is adjusted to give the standard output with an input wanted signal of type A2 at a level of 40 decibels above one microvolt and of a frequency of 500 kc/s.

(2) the input wanted signal has been removed, and

(3) (a) any two interfering signals, one of type A1 and the other of type A2, each at a level of 110 decibels above one microvolt and of such frequency as to give no appreciable output when applied alone, and of which the frequency sum or difference is 500 kc/s, are then simultaneously applied or

(b) a signal of type A2 at a level of 116 decibels above one microvolt and of a frequency of 250 kc/s is applied.

13. **OUTPUT LIMITING.**—If the receiver is intended for loudspeaker reception the receiver shall be provided with an efficient and automatic means of reducing the gain during the reception of strong signals.

14. **TUNING DRIFT AND STABILITY.**—The tuning drift and the stability of the receiver shall be such that within five minutes of the receiver being switched on the requirements of paragraph 7 of this Part of this Schedule shall be met.

15. **FIDELITY.**—The fidelity of the receiver shall be such that a change in the audio-frequency output shall be less than 8 decibels when the modulation frequency of the input signal is varied continuously from 400 c/s to 1,400 c/s the level and modulation depth of the input signal being kept constant. For the purposes of this paragraph the input signal may have any level and depth of modulation provided the output of the receiver does not exceed the standard output.

16. **RADIATION.**—(1) The receiver when in use shall not produce a field exceeding 0.1 microvolt per metre when measured at a distance of one mile from the receiver.

(2) The receiver shall be deemed to comply with the requirement of subparagraph (1) of this paragraph if, when :—

(a) the receiver is placed centrally in a screened earthed enclosure of dimensions at least six feet cube,

(b) the earth terminal of the receiver is connected to the inside of the screen,

(c) the aerial terminal is connected through an unscreened four-turn rectangular search coil situated within the said enclosure and of dimensions one foot square and an unscreened lead to a resistive measuring instrument mounted outside the enclosure and having its other terminal earthed, and

(d) the receiver is then energised and unscreened headphones are connected thereto, the power measured by the measuring instrument does not exceed  $4 \times 10^{-10}$  watts whatever the resistance of the measuring instrument or the adjustment of the receiver, and notwithstanding that the search coil is short-circuited or moved in any way, without approaching within six inches of the receiver case.

#### PART V

#### AUTOMATIC KEYING DEVICE

1. The automatic keying device (in this Part of this Schedule referred to as "the device") shall be capable of :—

(1) being connected in place of the manual transmitting key by a jack or other efficient means, to

(a) the main radiotelegraph transmitter,

- (b) the emergency radiotelegraph transmitter, and
- (c) the auto-alarm test signal generator referred to in paragraph 1 of the Seventh Schedule to these Rules ;

(2) when connected to any of the aforesaid equipment,

(a) keying automatically the alarm signal specified in paragraph 3 of this Part of this Schedule and immediately thereafter stopping and opening the keying circuit unless re-set or re-wound ; and

(b) keying automatically the distress call specified in paragraph 4 of this Part of this Schedule in such manner that if the device is used without attention the automatic keying of the distress call will be repeated once every twelve minutes.

The device shall not be capable of keying any signals other than those specified in paragraphs 3 and 4 of this Part of this Schedule.

2. When switched out of circuit after transmission of the distress call, the device shall be capable of being re-set by automatic or manual means so that after the device has again been switched into circuit keying shall commence within ten seconds at the beginning of the distress call.

If the re-setting is by manual means the device shall include a means for indicating when re-setting is necessary.

3. The alarm signal referred to in sub-paragraph (2) of paragraph 1 of this Part of this Schedule shall consist of twelve four second dashes separated by one second spaces, the length of the dashes and spaces being maintained within a tolerance of plus or minus 0.2 second.

4. (1) The distress call referred to in the said sub-paragraph shall consist of the following signals in the following order :—

- (a) the distress signal . . . - - - . . . , repeated three times ;
- (b) the morse characters for the word DE ; and
- (c) a long dash.

Provided that the morse characters for the word DE may be omitted.

The characters of the distress signal shall be keyed at a speed of not more than 16 words per minute and the duration of the long dash shall not be less than 20 seconds.

The total length of the distress call shall not exceed 90 seconds.

(2) The mechanism for keying the distress call specified in sub-paragraph (1) of this paragraph shall be such that it can be readily adapted so as to enable the device to key, within a period of 90 seconds, a distress call consisting of the following signals in the following order :—

- (a) the distress signal . . . - - - . . . , repeated three times ;
- (b) the morse characters for the word DE ;
- (c) the morse characters for the ship's call sign three times ; and
- (d) a long dash having a duration of at least 20 seconds.

5. If the device is electrically operated, the source of electrical energy by which it is operated shall be the emergency source of electrical energy referred to in paragraph (2) of Rule 14 of these Rules.



## THIRD SCHEDULE

## RADIOTELEPHONE INSTALLATION (Rule 5 (2))

1. DEFINITION.—In this Schedule the expression “the equipment” includes a radiotelephone transmitter and receiver, and all other equipment necessary for the operation of the installation, but does not include an aerial.

2. TYPES OF WAVE AND FREQUENCY RANGE.—(1) The equipment shall be capable of adjustment for the transmission and reception of both type A2 and type A3 waves on any frequency within the frequency range 1,600 kc/s to 3,800 kc/s.

(2) The facilities for the transmission of type A2 waves shall be so designed that they can be rendered incapable of operation by internal disconnection.

3. OPERATING FREQUENCIES.—The equipment shall be capable of transmitting and receiving type A2 and type A3 waves, and shall be capable of being set for both transmission and reception on the radiotelephone distress frequency and on at least the number of spot frequencies specified in the following table, and selected at any points within the relative frequency limits therein specified. The transmitter shall not be capable of being operated otherwise than on spot frequencies.

Number of spot frequencies		Frequency Limits
Transmitting	Receiving	
4 and	4 and	1,600 to 2,850 kc/s
2 and	2 and	3,500 to 3,800 kc/s
1	1	1,600 to 3,800 kc/s

4. POWER SUPPLY.—The equipment shall be capable of being operated from the supply of electrical energy required by Rule 25 of these Rules.

5. TRANSMITTER.—(1) Selection of any of the transmitter frequencies referred to in paragraph 3 of this Schedule shall be by a single switch or push button.

(2) The transmitter shall comply with the requirements specified in this Schedule when connected to each of the artificial aerials specified in the following table :—

Frequency range	Artificial aerials (all elements in series)		
	Resistance Ohms	Capacitance Picofarads	Inductance Microhenrys
Below 3 Mc/s .. ..	6	250	—
Above 3 Mc/s .. ..	10	250	—
	40	250	8

(3) The total carrier power delivered by the transmitter to the aforesaid artificial load (not including power dissipated in an aerial tuning inductor or any other component forming part of the transmitter) shall on any frequency between 1,600 kc/s and 3,800 kc/s be not less than 15 watts and not more than 100 watts and means shall be provided for reducing such power to a power between 5 watts and 10 watts.

(4) A peak limiter shall be provided to prevent over-modulation of the transmitter.

(5) The speech modulation of the transmitter shall be such that :—

(a) the frequency response of the microphone and transmitter together shall not vary by more than 7.5 decibels from a value which rises at the rate of 6 decibels per octave from 250 c/s to 2,500 c/s.

(b) the response relative to the peak response shall not be higher than :—

(i) minus 20 decibels at all frequencies above 3,500 c/s., and not above 5,000 c/s and.

(ii) minus 40 decibels at all frequencies above 5,000 c/s.

(6) The modulating system shall be such that the peak modulation of the transmitter lies between 80 and 95 per cent for any sound pressure the root mean square value of which, measured in the plane of the microphone mouthpiece with a pure wave of 1,000 c/s., lies between 25 dynes and 100 dynes per square centimetre.

(7) With the transmitter operating at its rated power or below and modulated to a depth of 90 per cent by a sinusoidal wave of frequency 400 c/s applied to the microphone terminals, and with the peak limiter rendered inoperative, the harmonic contents of the modulated output voltage shall not exceed 10 per cent.

(8) The transmitter shall be capable of maintaining a frequency tolerance of plus or minus 0.02 per cent throughout every transmission without adjustment of any control and notwithstanding variations of the impedance of the aerial or other load to which it is connected, or variations of supply voltage within plus or minus 10 per cent.

(9)—(a) The radio-frequency output of the transmitter shall be free from frequency components due to spurious oscillations in any part of the equipment.

(b) The output power at any harmonic of the radio-frequency shall not exceed 0.1 watt.

(c) With the microphone open or short-circuited :—

(i) the total noise and hum power in the output wave shall be at least 20 decibels below the carrier power ;

(ii) the total noise and hum power contained in the sidebands corresponding to audio-frequencies between the limits of 250 c/s and 3,000 c/s shall be at least 40 decibels below the carrier power.

(10) The transmitter shall be such that :—

(a) in not more than 10 seconds one operator can carry out all such adjustments as are necessary to change the transmitter from operation on any one of the frequencies referred to in paragraph 3 of this Schedule to operation on any other of such frequencies ;

(b) if the transmitter is so designed and constructed that it is necessary to delay the application of certain voltages for a period after it has been switched on, the delay shall be automatically provided by a delay switch :

(c) an indicator shall show when the transmitter is ready for operation ; and

(d) a skilled person can make alterations in the spot frequencies within the limits specified in paragraph 3 of this Schedule without removing the installation from the ship.

(11) If the transmitter is adjusted for the transmission of type A2 waves :—

(a) the depth of modulation shall not be less than 70 per cent and not more than 100 per cent ;

(b) the note frequency shall not be less than 500 c/s and not more than 1,200 c/s ; and

(c) the transmitter shall be capable of transmitting telegraph signals at all speeds up to 30 bauds.

(12) The transmitter shall be so designed and constructed that when it is adjusted for maximum power the aerial may be disconnected or the output short-circuited without damage being caused to any part of the installation. Means shall be provided for protecting the transmitter from damage caused by excessive current or voltage.

6. RECEIVER.—(1) Means shall be provided to enable each of the receiver spot frequencies referred to in paragraph 3 of this Schedule to be selected by a single operation.

(2) The receiver shall be capable of both telephone and loudspeaker reception.

(3) The receiver shall be provided with :—

(a) a manual audio-frequency gain control ; and

(b) an automatic gain control capable of efficient operation on type A2 and type A3 waves.

(4) Any peak limiter or other device included in the detector or output circuits of the receiver for the purpose of reducing the effect of impulsive noise signals shall be capable of being disconnected by means of a switch.

(5) The receiver shall comply with the requirements of sub-paragraphs (6) to (14) inclusive, of this paragraph when tested in the following manner, except where another manner of testing is specified in the said sub-paragraphs :—

(a) artificial aeriels with the characteristics specified in the table set forth in sub-paragraph (2) of paragraph 5 of this Schedule shall be used for the test ;

(b) type A2 signals used for the test shall be modulated to a depth of 30 per cent with a note frequency of 400 c/s ;

(c) the standard audio-frequency output of the receiver (in this paragraph referred to as the "standard output") shall be :—

(i) for telephone receiver reception, one milliwatt into a resistance which is substantially equal to the modulus of the impedance of the telephone at 1,000 c/s ;

(ii) for loud-speaker reception, 50 milliwatts into a resistance which loads the output valve with the load appropriate to the valve.

(6) —(a) The selectivity of the receiver measured at a point immediately preceding the final detector shall satisfy the following requirements at the relative frequencies specified :—

Discrimination of not more than 6 decibels to be obtained at frequencies removed from tune by ..	3 kc/s
Discrimination of at least 30 decibels to be obtained at frequencies removed from tune by ..	7.5 kc/s
Discrimination of at least 60 decibels to be obtained at frequencies removed from tune by ..	15 kc/s
Discrimination of at least 80 decibels to be obtained at frequencies removed from tune by ..	30 kc/s

(b) If the receiver is a superheterodyne receiver :—

(i) the image discrimination shall not be less than 35 decibels at frequencies above 3 Mc/s and not be less than 40 decibels at frequencies below 3 Mc/s and

(ii) the intermediate frequency response ratios shall not be less than the following :—

<i>Intermediate frequency</i>	<i>Intermediate frequency response ratio</i>
Between 140 and 1,600 kc/s ..	80 decibels
Outside the above limits ..	60 decibels

(7) The signals/noise ratio of the output of the receiver shall be at least 20 decibels when the receiver is adjusted to give the standard output with an input signal of type A2 a level of 30 decibels above one microvolt.

(8) The automatic gain control shall be such that when the receiver is adjusted to give the standard output with an input signal of type A2 at a level of 30 decibels above one microvolt :—

(a) an increase in input of 20 decibels will result in an improvement in the signal/noise ratio of at least 15 decibels; and

(b) an increase in input of 50 decibels will not increase the output by more than 10 decibels.

(9) The change in output of the receiver shall not exceed 3 decibels when the receiver is adjusted to give the standard output with an input wanted signal of type A2 at a level of 60 decibels above one microvolt and a type A1 input signal is simultaneously applied at a level of 160 decibels above one microvolt and at a frequency of 20 kc/s above or below the wanted frequency.

(10) An output of level higher than 30 decibels below the standard output shall not be produced when the receiver is adjusted to give the standard output with an input wanted signal of type A2 at a level of 60 decibels above one microvolt the modulation of the signal generator has been switched off, and a type A2 input signal is simultaneously applied at a level 90 decibels above one microvolt and at a frequency of 20 kc/s above or below the wanted frequency.

(11) An output exceeding the standard output shall not be produced when the receiver is adjusted to give the standard output with an input signal of type A2 at a level of 30 decibels above one microvolt, the wanted



signal has been removed, and two interfering signals are simultaneously applied, one of type A1 and one of type A2, each of level 100 decibels above one microvolt, of which the frequency sum or difference is the same as the frequency of the wanted signal, but neither of which will give an appreciable output when modulated and applied alone.

(12) The maximum change in level of the audio-frequency output shall be less than 8 decibels when the modulation frequency of the input signal is varied continuously from 250 c/s to 3,000 c/s, the input signal remaining constant in level and depth of modulation. When the modulation frequency is increased above 3,000 c/s the output shall fall rapidly. The input signal may have any level and depth of modulation provided the output of the receiver does not exceed the standard output.

(13) The total harmonic content of the audio-frequency output voltage of the receiver at any output not exceeding the standard output shall not exceed :—

(a) 5 per cent with an input signal at any level between 40 and 80 decibels above one microvolt and sinusoidally modulated to a depth of 30 per cent, at 400 c/s,

(b) 15 per cent with an input signal as prescribed in (a) but modulated to a depth of 80 per cent at 400 c/s.

(14) Each frequency of tune referred to in paragraph 3 of this Schedule shall be maintained within one kilocycle per second of its nominal value notwithstanding variation in the supply voltage of plus or minus 10 per cent and notwithstanding ambient temperature changes from minus 10°C to plus 40°C.

(15)—(a) The receiver shall not in normal service produce a field exceeding 0.1 microvolt per metre when measured at a distance of one mile from the receiver.

(b) The receiver shall be deemed to comply with the requirement of sub-paragraph (a) of this paragraph if, when :

(i) the receiver is placed centrally in a screened earthed enclosure of dimensions at least six feet cube,

(ii) the earth terminal of the receiver is connected to the inside of the screen,

(iii) the aerial terminal is connected through an unscreened four-turn rectangular search coil situated within the said enclosure and of dimensions one foot square and an unscreened lead to a resistive measuring instrument mounted outside the enclosure and having its other terminal earthed, and

(iv) the receiver is then energised and unscreened headphones are connected thereto,

the power measured by the measuring instrument does not exceed  $4 \times 10^{-10}$  watts whatever the resistance of the measuring instrument or the adjustment of the receiver, and notwithstanding that the search coil is short-circuited or moved in any way without approaching within six inches of the receiver case.

7. FACILITIES FOR TWO-WAY COMMUNICATION.—(1) The equipment shall be capable of changing instantaneously from transmitting to receiver and vice versa by means of a pressel or other single switch, aerial change-over relays, and such other devices as are necessary for that purpose. If, in addition, a voice-operated device is provided for that purpose the operating lag shall not exceed 10 milli-seconds, and the release lag shall not be less than 150 milli-seconds and not more than 200 milli-seconds.

(2) Means shall be provided for protecting the receiver from damage when the equipment is transmitting.

(3) Means shall be provided to assure automatically that at all times when the microphone is in use the loud-speaker is disconnected.

8. SIZE OF CONTROLS.—All controls on the receiver shall be of such size as to permit normal adjustments being performed by a person wearing thick gloves.

9. CRYSTAL HOLDERS.—If the installation is designed for use with piezo-electric crystals, it shall be suitable for use with a crystal holder specified in paragraph 13 of Part I of the Second Schedule to these Rules.

#### FOURTH SCHEDULE

(Rules 4, 36)

##### CLIMATIC AND DURABILITY TESTS

1. In this Schedule :—

(1) references to Class B equipment shall be construed as references to equipment appropriated for use only below deck or in a deckhouse or other similar compartment ; and

(2) references to Class X equipment shall be construed as references to equipment appropriated for use or storage in the open or in an open boat.

2.—(1) Class B equipment shall be subjected to the tests named opposite the letter B in the table given in sub-paragraph (4) of this paragraph, and Class X equipment shall be subjected to the tests named opposite the letter X in that table.

(2) All such tests shall be conducted in the order in which they appear in the aforesaid table.

(3) At any time when the equipment is required by the provisions of paragraph 3 of this Schedule to be kept working for the purposes of such tests, power shall be supplied thereto at the voltage at which such equipment is designed to be operated.

(4)

TABLE

Nature of Test	Classes of equipment to which the test shall be applied
(1) Vibration test .. .. .	B and X
(2) Bump test .. .. .	B and X
(3) Dry heat test .. .. .	B and X
(4) Damp heat test .. .. .	B and X
(5) Low temperature test .. .. .	B and X
(6) Rain Test .. .. .	X
(7) Immersion test .. .. .	X
(8) Corrosion test—salt water .. .. .	B and X
(9) Corrosion test—acid fumes (if a battery is included in the equipment) .. .. .	B and X
(10) Mould growth test .. .. .	X

3. The tests referred to in paragraph 2 of this Schedule shall be conducted respectively as follows:—

(1) **VIBRATION TEST.**—The equipment, complete with its chassis covers and shock absorbers (if any) shall, in its normal operating position, be clamped to a vibration table. The table shall be vibrated at all frequencies between 0 and  $12\frac{1}{2}$  cycles per second at an amplitude of plus or minus 0.16 cm. during which period the equipment shall be kept working continuously. The table shall be so vibrated for three periods each of which shall be of eight minutes duration. Throughout each such period the direction of the vibrations shall be perpendicular to the direction of the vibrations during the other two periods.

(2) **BUMP TEST.**—The equipment shall be subject to not less than 500 bumps at a constant rate of between one and four bumps per second with a free drop of at least 2.5 cm.

(3) **DRY HEAT TEST:—**

(a) Class B equipment shall be placed in a chamber which is maintained for a period of two hours at a constant temperature of 55°C within a tolerance of plus or minus 1°C, during which period the equipment shall be kept working continuously.

(b) Class X equipment shall be placed in a chamber which is maintained for a period of ten hours at a constant temperature of 70°C within a tolerance of plus or minus 1°C, during which period the equipment shall not be worked or tested. The said chamber shall then be cooled to a constant temperature of 55°C within a tolerance of plus or minus 1°C and the equipment shall be kept working continuously at that temperature for a period of two hours.

(4) **DAMP HEAT TEST.**—The equipment shall be prepared for the damp heat test in the following manner:—

(a) The equipment shall be placed in a chamber which within a period not exceeding two hours shall be heated from room temperature to 40°C and shall be brought to a relative humidity of not less than 95 per cent.

(b) The chamber shall be kept at a temperature of 40°C within a tolerance of plus or minus 1°C for a period of 12 hours, and at a relative humidity of not less than 95 per cent.

(c) At the beginning of the last 60 minutes of such period, all accessible surfaces and components shall be wiped dry and any fans or drying lamps provided in the equipment shall be switched on.

After the fans or drying lamps have been in operation for 30 minutes and while the temperature of the chamber is still 40°C, subject to the aforesaid tolerance, the equipment shall be tested.

After the equipment has been tested the temperature of the chamber shall, in preparation for the low temperature test, be allowed to fall below 25°C the equipment remaining in the chamber.

(5) **LOW TEMPERATURE TEST.**—(a) Class B equipment shall be exposed to a temperature of minus 15°C at normal atmospheric pressure for a period of not less than twelve hours.

(b) Class X equipment shall be exposed to a temperature of minus 25°C at normal atmospheric pressure for a period of not less than twelve hours.

(6) RAIN TEST.—The equipment shall be placed in a chamber fitted with eight shower heads, the discharge end of which shall consist of a flat, non-rustable metal plate, 0.16 cm. thick, having thirty-six holes each of 0.1 cm. diameter evenly spaced in concentric circles in the following manner :—

16 holes on the periphery of circles of 5.1 cm. diameter.

8 holes on the periphery of a circle of 3.8 cm. diameter.

8 holes on the periphery of a circle of 2.5 cm. diameter.

4 holes on the periphery of a circle of 1.3 cm. diameter.

The said shower heads shall be arranged at a distance of not less than 50 cm. and not more than 80 cm. from the equipment in such a manner that spray from four of such shower heads is directed downwards at an angle of  $45^\circ$  at each of the four uppermost corners of the equipment, and the spray from the other four shower heads is directed horizontally at the centre of each area of the four sides of the equipment. Fresh water at room temperature and at a static pressure of not less than 15 or more than 25 pounds per square inch shall be sprayed on to the equipment from the aforesaid shower heads for a period of one hour with equipment in the position in which it is normally operated. Throughout the test the equipment shall be rotated at between 12 and 20 revolutions per minute about a vertical axis passing through the centre of the equipment.

(7) IMMERSION TEST.—The equipment in the condition in which it will normally be kept on board ship shall be immersed in water the surface of which is at least 10 cm. above the highest point of the equipment, and shall remain for a period of one hour. Upon its removal from the water the equipment shall be drained of water.

(8) CORROSION TEST (SALT WATER).—The equipment shall be placed in a chamber fitted with apparatus capable of spraying in the form of a fine mist either natural sea water or tap water containing the following salts in solution :—

Sodium Chloride	..	..	..	..	..	2.7 per cent
Magnesium Chloride	..	..	..	..	..	0.6 per cent
Calcium Chloride	..	..	..	..	..	0.1 per cent
Potassium Chloride	..	..	..	..	..	0.07 per cent

The quantity of each salt shall be subject to a tolerance of plus or minus 10 per cent.

Such spraying apparatus shall be such that the products of corrosion cannot mix with the sea water or solution contained in the spray reservoir. The equipment shall be sprayed simultaneously on all its external surfaces with the sea water or solution for a period of one hour and shall be kept working continuously for the last thirty minutes thereof. The equipment shall immediately thereafter be stored for a period of seven days at a temperature of  $40^\circ\text{C}$  within a tolerance of plus or minus  $1^\circ\text{C}$  at a relative humidity of not less than 60 per cent, and not more than 80 per cent. The equipment shall be sprayed and stored as aforesaid on four separate occasions.

(9) CORROSION TEST (ACID FUMES).—Any battery included in the equipment shall be fully charged and shall then be fitted into the equipment. If the arrangements are such that the battery can be charged without being removed from the equipment, the battery shall continue to be charged at the maximum rate appropriate to it for a period of twenty-four hours. The



equipment shall immediately thereafter be stored for a period of four weeks at a temperature of 40 °C within a tolerance of plus or minus 1 °C at a relative humidity of not less than 60 per cent and not more than 80 per cent.

(10) MOULD GROWTH TEST.—The equipment shall be inoculated by spraying with an aqueous suspension of mould spores containing all the cultures named in column A or all the cultures named in column B of the following table :—

A	B
Aspergillus niger ; Aspergillus amstelodami ; Paecilomyces varioti ; Stachybotrys atra ; Penicillium brevi-compactum ; Penicillium cyclopium ; Chaetomium globosum.	Aspergillus niger ; Aspergillus amstelodami ; Aspergillus versicolor ; Stachybotrys atra ; Penicillium brevi-compactum ; Cladosporium herbasum.

Immediately after it has been so sprayed the equipment shall be placed in a chamber, the temperature of which shall be maintained at any fixed value within the range 31 °C to 33 °C inclusive and controlled to within a tolerance of plus or minus 1 °C at a relative humidity of not less than 95 per cent. The equipment shall remain in the said chamber for a period of twenty-eight days.

## FIFTH SCHEDULE

(Rules 31 and 32)

### RADIOTELEGRAPH EQUIPMENT FOR LIFEBOATS

#### PART I

#### FIXED EQUIPMENT

1. GENERAL. —(1) The radiotelegraph equipment for lifeboats (in this Part of this Schedule referred to as "the equipment") shall include a radiotelegraph transmitter and receiver, an aerial and earth system, a source of energy and all other equipment necessary for the operation of the installation.

(2) The equipment shall be so designed that an unskilled person can readily cause it to transmit the signals referred to in paragraph 5 of this Part of this Schedule.

(3) The purpose of all controls not required for transmitting the said signals shall be clearly and permanently indicated.

(4) Simple instructions for the operation of the equipment on the frequencies specified in sub-paragraph (1) of paragraph 4 and sub-paragraph (1) of paragraph 6 of this Part of this Schedule shall be affixed in clear and permanent form to or near the equipment.

(5) All controls shall be of such size as will permit normal adjustments to be made by a person wearing thick gloves, and in particular all tuning knobs shall not be less than 2 inches in diameter.

(6) The change-over from transmitting to receiving and vice versa, including automatic change of aerial connections, shall be made by means of one switch.

(7) The equipment shall be readily removable from the lifeboat.

(8) An electric lamp of power between 3 watts and 15 watts, with a water-proof casing, shall be provided to illuminate the control panels and the aforesaid instructions.

(9) An electrical heater, connected to the ship's mains shall be provided and shall be capable of maintaining the interior of the case in which the equipment is installed at a temperature at least 10°C above the ambient temperature. The heater shall be so mounted that it will reduce the risk of the controls or cover of the equipment becoming frozen into position but will not cause any part of the installation to become overheated.

(10) All parts other than the aerial and its terminal which are not at earth potential shall be enclosed. The aerial terminal shall be guarded against accidental contact.

(11) The equipment shall be capable of complying with the performance requirements specified in this Part of this Schedule while the lifeboat engine is running, and whether or not the battery is being charged.

2. AERIAL AND EARTH SYSTEM.—(1) The equipment shall include:—

(a) a single-wire aerial of high conductivity stranded or braided wire capable of being supported by the lifeboat mast without the use of top-masts at a maximum height of not less than 22 feet above the waterline; and

(b) an earth system which shall be of the same material throughout and shall consist of at least three independent bolted connections:—

(i) to the hull in the case of a metal lifeboat, or

(ii) to a bare copper plate of area at least six square feet fixed to the hull below the waterline in the case of a wooden lifeboat.

(2) The aerial system shall be mechanically robust.

(3) All practicable steps shall be taken to reduce aerial losses to a minimum.

(4) All parts of the aerial which may come in contact with the occupants of the lifeboat when the equipment is in use shall be insulated.

3. SOURCE OF ENERGY.—(1) The equipment shall include one 24 volt battery composed of secondary cells and of a capacity sufficient to operate the receiver for four hours and immediately thereafter to run the transmitter under full-power marking conditions for two hours.

(2) If it is intended to operate a searchlight from the battery, the capacity thereof shall be at least 30 ampere hours in excess of that referred to in subparagraph (1) of this paragraph.

(3) The battery shall be capable of being completely recharged:—

(a) in not more than 20 hours from a dynamo working in conjunction with and throughout the normal range of speeds of the lifeboat engine if the battery is not in use at the same time; and

(b) from the ship's main source of electrical energy without being removed from the lifeboat.

(4) The battery shall not spill when tilted to an angle of 60° from its normal position in any direction.

(5) The battery shall be electrically isolated from the rest of the equipment when the transmitter and receiver are switched off.

(6) If a vibrator power unit is employed, a reserve vibrator shall be provided and so controlled by a change-over switch that it can be put into circuit immediately.

4. TRANSMITTER.—(1) The equipment shall include a transmitter capable of:

(a) sending continuously but not simultaneously radiotelegraph signals of type A2 waves on the frequencies of 500 kc/s and 8,364 kc/s:—

(i) by manual operation at all speeds up to at least 25 bauds without critical relay adjustment; and

(ii) by means of an automatic keying device complying with the requirements of paragraph 5 of this Part of the Schedule; and

(b) maintaining without adjustment of any control, a frequency tolerance throughout every transmission of:—

(i) plus or minus 0.5 per cent on a frequency of 500 kc/s; and

(ii) plus or minus 0.02 per cent on a frequency of 8,364 kc/s.

(c) operation on full power within 30 seconds of being switched on.

(2) The carrier wave shall be modulated to a depth of 100 per cent by a wave of rectangular character so that the carrier is switched on for not less than 30 per cent and not more than 50 per cent of a modulation cycle.

(3) The note frequency shall not be less than 500 c/s and not more than 1,200 c/s.

(4) The power of the transmitter:—

(a) shall not be less than 15 metre-amperes on a frequency of 500 kc/s when determined in the manner prescribed by paragraph (3) of Rule 13 of these Rules;

(b) shall not be less than 50 watts on a frequency of 500 kc/s, when measured into an artificial aerial consisting of a 30 ohm resistor in series with a capacitor of every value between 350 and 450 picofarads; and

(c) shall not be less than 15 watts on a frequency of 8,364 kc/s when, measured into an artificial aerial simulating the impedance of the aerial specified in paragraph 2 of this Part of this Schedule.

(5) The transmitter shall be so designed and constructed that when it is adjusted for maximum power and the transmitting key is depressed the aerial may be disconnected or the output short-circuited without damage being caused to any part of the installation.

(6) There shall be provided:—

(a) an artificial aerial for testing the transmitter on full power, which shall include an indicator or lamp to indicate the passage of radio-frequency currents; and

(b) an aerial ammeter, and a visual indicator to indicate the passage of radio frequency current, the failure of either of which shall not disconnect the aerial circuit.

5. AUTOMATIC TRANSMISSION.—(1) A device for automatic keying shall be provided as part of the radiotelegraph installation for lifeboats which when switched into circuit with the transmitter, shall be capable of automatically:—

(a) sending the alarm signal specified in sub-paragraph (2) of this paragraph immediately thereafter stopping and opening the keying circuit unless reset or re-wound; and

(b)—(i) sending the distress call specified in sub-paragraph (3) of this paragraph in such manner that if the device is used without attention the transmission will be repeated once every twelve minutes until the source of electrical energy is exhausted; and

(ii) switching off the electrical energy to the transmitter in the silent interval between such transmissions and, so far as is necessary for the protection of the transmitter, automatically delaying the application of electrical energy after the device has been switched on.

(2) The alarm signal shall consist of twelve four second dashes separated by one second spaces, the length of the dashes and spaces being maintained within a tolerance of plus or minus 0.2 second.

(3) The distress call shall consist of the distress signal . . . — — — . . . repeated three times followed by a long dash, the characters of the distress signal being transmitted at a speed between 8 and 16 words inclusive per minute, and the duration of the long dash shall not be less than 20 seconds. The total length of the call shall not exceed 90 seconds.

(4) Means shall be provided to ensure that, when the distress signal is sent, the transmission begins at the commencement of the signal within 40 seconds after the device for automatic keying has been switched into circuit.

(5) The mechanism for keying the distress call specified in sub-paragraph (3) of this paragraph shall be such that it can be readily adapted to send a distress call consisting of the following signals in the following order:—

- (a) the distress signal . . . — — — . . . three times ;
- (b) the morse characters for the word DE ;
- (c) the morse characters for the lifeboat's call sign three times ; and
- (d) a long dash having a duration of at least 20 seconds.

The duration of the distress call shall not in that case be more than 90 seconds.

6. RECEIVER.—(1) The equipment shall include a receiver capable of:—

- (a) receiving type A2 and type B waves ; and
- (b) being tuned over the frequency range 488 kc/s to 513 kc/s.

(2) High frequency reception, if provided, shall be capable of receiving type A1 and type A2 waves on any frequency within the frequency band 8,266 kc/s to 8,745 kc/s.

(3) The receiver shall be fitted with a manual gain control.

(4) Headphones shall be provided and shall be shrouded to exclude noise.

(5) The receiver shall comply with the requirements of sub-paragraph (6) to (9) inclusive, of this paragraph when tested in the following manner:—

- (a) an artificial aerial shall be used and shall consist of a 40 ohm resistance in series with a two microhenry inductance and 100 picofarad capacitance ;
- (b) a type A2 signal shall, unless otherwise specified, be modulated to a depth of 30 per cent at 400 c/s ; and
- (c) the standard audio-frequency output shall be one milliwatt into a resistance substantially equal to the modulus of the impedance of the telephone receivers at 1,000 c/s.

(6) (a) The selectivity preceding the final detector of the receiver shall comply with the following requirements over the frequency range 488 kc/s to 513 kc/s:—

- (i) not more than 6 decibels discrimination shall be obtained at frequency removed from tune by 1 kc/s ;
- (ii) at least 6 decibels discrimination shall be obtained at frequencies removed from tune by 4 kc/s ;



(iii) at least 30 decibels discrimination shall be obtained at frequencies removed from tune by 20 kc/s ;

(iv) at least 60 decibels discrimination shall be obtained at frequencies removed from tune by 50 kc/s.

(b) In the case of a superheterodyne receiver, the image response ratio shall be at least 20 decibels.

(7) The sensitivity of the receiver shall be such that the standard audio-frequency output is obtained with an input not exceeding the following levels :

<i>Frequencies</i>	<i>Maximum input for type A1 waves</i>	<i>Maximum input for type A2 waves</i>
500 kc/s	does not apply	40 decibels above 1 microvolt.
8,364 kc/s (if provided)	30 decibels above 1 microvolt.	40 decibels above 1 microvolt.

(8) The signal/noise ratio shall, with the inputs and waves respectively specified in sub-paragraph (7) of this paragraph and with the rotary converter or vibrator running be not less than ;

(a) 15 decibels on a frequency of 500

(b) 25 decibels on a frequency of 8,364 kc/s (if provided.)

(9) The fidelity of the receiver shall be such that the change in level of the audio-frequency output shall be less than 8 decibels as the modulation frequency of the input signal is varied continuously from 300 c/s to 1,500 c/s the level and modulation depth of the input signal being kept constant. For this purpose the input signal may have any level and depth of modulation provided the output of the receiver does not exceed the standard audio-frequency output.

7. CONNECTIONS WITH SHIP'S MAINS.—Any connections of the equipment with the ship's main source of energy shall be so provided as not to interfere with the launching of the lifeboat.

## PART II.—PORTABLE EQUIPMENT

1. GENERAL.—(1) The portable radiotelegraph equipment for lifeboats (in this Part of this Schedule referred to as "the equipment") shall include a hand generator, a transmitter, a receiver and all other apparatus necessary for the operation of the equipment.

(2) Simple instructions for the operation of the equipment on the frequencies specified in sub-paragraph (1) of paragraph 5 of this Part of this Schedule shall be affixed in clear and permanent form, to the equipment.

(3) The equipment shall bear a removable plate on which shall be indicated in clear and permanent form the call sign of the lifeboat in letters and morse characters.

(4) For the purposes of the Fourth Schedule to these Rules the equipment shall be deemed to be Class X equipment. The immersion test specified in sub-paragraph (7) of paragraph 3 of the said Schedule shall be applied to the equipment when packed in the manner in which it will be stored on board ship.

2. DESIGN AND CONSTRUCTION.—The equipment shall be so designed and constructed that :—

(1) the entire equipment is contained in a single unit, provided that the mast referred to in sub-paragraph (2) of paragraph 3 of this Part of this Schedule may be attached to the single unit ;

(2) an unskilled person can erect the aerial system, and without difficulty and by simple operation and automatic means, can transmit the radiotelegraph signals specified in sub-paragraph (4) (a) of paragraph 5 of this Part of this Schedule ;

(3) the equipment is provided with handles and is readily portable by one person ;

(4) it is watertight and capable of floating in water ;

(5) it may be dropped from a height of 30 feet into water without damage ;

(6) it may be lowered into the sea or lifeboat from the boat deck ;

(7) it may be clamped to a lifeboat ;

(8) the number of manual controls are kept to the minimum required to meet the requirements of this Part of this Schedule, but include :—

(a) send, receive switching ;

(b) a switch for changing transmission from 500 kc/s to 8,364 kc/s and vice versa ;

(c) a switch position so that the transmitter valve filaments can be energised continuously whilst the receiver is energised ;

(d) a single control of receiver gain ;

(9) all manual controls are of such size as to permit normal adjustments to be made by a person wearing thick gloves ; and

(10) the operation of manual controls is not impeded by, and does not impede, the hand generation of electrical energy.

3. AERIAL AND EARTH SYSTEM.—The equipment shall include :—

(1) a single-wire aerial consisting of not less than 30 feet of high conductivity stranded or braided wire so fitted as to be capable of being supported from the lifeboat mast without the use of top-masts at the maximum practicable height ;

(2) a collapsible stayed mast capable of being easily and quickly installed in a lifeboat and of supporting the aerial at a height of at least 16 feet above the sea when the base of the mast is resting on the bottom of any lifeboat in which it is intended to be used ; and

(3) an earth wire of high conductivity firmly connected to the equipment and loaded in such manner that the wire will sink when placed overboard.

4. HAND GENERATOR.—(1) The hand generator shall be of such design and construction that when the handle of the generator is rotated at any speed within the normal range of handle speeds :—

(a) sufficient electrical energy will be generated :—

(i) to enable the transmitter to comply with the requirements of sub-paragraph (4) (e) of paragraph 5 of this Part of this Schedule ; and

(ii) to enable the receiver to comply with the requirements of paragraph 6 of this Part of this Schedule ;

(b) the transmitter will comply with the requirements of sub-paragraph (4) (e) of paragraph 5 of this Part of this Schedule with a torque-speed at the handle of not more than 400 expressed in pounds-feet multiplied by revolutions per minute ; and

(c) an indicator lamp will be lit, but will not be lit at any speed not within the normal range of handle speeds.

In this Part of this Schedule the expression "normal range of handle speeds" in relation to a generator means the range of speeds extending from the minimum speed at which the generator will enable the transmitter forming part of the same equipment to comply with the requirements of sub-paragraph (4) (e) of paragraph 5 of this Part of this Schedule to a speed at least 40 per cent greater than that speed.

(2) The hand generator shall be of such design and construction that :—

(a) it can be operated by :—

(i) one person ; and

(ii) two persons simultaneously ;

(b) the handles cannot be rotated in the wrong direction.

TRANSMITTER.—(1) The transmitter shall be capable of :—

(a) sending continuously, but not simultaneously, type A2 waves on the frequencies of 500 kc/s and 8,364 kc/s :—

(i) by manual operation at all speeds up to 16 bauds ; and

(ii) by automatic means at the speeds specified in sub-paragraph (4) (a) of this paragraph ;

(b) maintaining over the normal range of handle speeds throughout every transmission a frequency tolerance :—

(i) of plus or minus 0.5 per cent on a frequency of 500 kc/s

(ii) of plus or minus 0.02 per cent on a frequency of 8,364 kc/s ; without adjustment of any control, and notwithstanding any variations of the impedance of the aerial or artificial aerial to which it is connected ; and

(c) operating on full power, when the aerial system or artificial aerial has been connected and the necessary controls have been adjusted, within 30 seconds after the generation of electrical energy has commenced.

(2) The carrier wave shall be modulated to a depth of 100 per cent by a wave of rectangular character so that the carrier wave is switched on for not less than 30 per cent and not more than 50 per cent of a modulation cycle.

(3) The note frequency shall not be less than 450 c/s or more than 1,350 c/s.

(4) (a) The signal to be sent by the automatic means referred to in sub-paragraph (1) (a) of this paragraph :—

(i) when the transmission is on a frequency of 500 kc/s shall consist of the alarm signal of twelve four-second dashes separated by one-second spaces followed by the distress signal . . . — — — . . . repeated three times, and a long dash ; and

(ii) when the transmission is on a frequency of 8,364 kc/s shall include the distress signal . . . — — — . . . repeated three times followed by a long dash of not less than 30 seconds duration.

(b) Over the normal range of handle speeds :—

(i) the speed of the automatic transmission of the distress signal shall be not less than 8 and not more than 15 words a minute ;

(ii) the tolerance in the timing of the dashes of the alarm signal shall not be more than plus or minus 0.2 seconds.

(c) The automatic transmission shall cease and open the keying circuit after one complete transmission unless the mechanism is re-set or re-wound.

(d) Means shall be provided :—

(i) to ensure that the transmission begins at the commencement of the signal ;

(ii) to indicate to the operator that the mechanism should be re-set or re-wound.

(e) The mean power developed by the transmitter in the load during a marking period, shall :—

(i) on a frequency of 500 kc/s be not less than  $[(3.8 \log_{10} C) - 5.5]$  watts, C being the capacitance of the artificial aerial in picofarads, when measured with an artificial aerial consisting of a 15 ohm resistor in series with a capacitor having any value between the minimum capacitance of the aerial referred to in sub-paragraph (1) of paragraph 3 of this Part of this Schedule and 150 picofarads, and not less than 3.5 watts when measured with an artificial aerial consisting of a 30 ohm resistor in series with a capacitor having any value between 350 and 450 picofarads ;

(ii) on a frequency of 8,364 kc/s be not less than 3 watts when measured with an artificial aerial consisting of a 40 ohm resistor in series with any inductive or capacitated reactance in the range plus or minus 60 ohms.

(f) The aerial circuit shall include :—

(i) a tuning control suitable for use with all types of aerial provided, and

(ii) a tuning indicator, the failure of which shall not disconnect the aerial circuit,

(g) There shall be provided :—

(i) an artificial aerial within the equipment suitable for testing the transmitter on full power ;

(ii) means for testing the facilities for automatic transmission without the generation of radio-frequency energy.

(5) The transmitter shall be so designed and constructed that when it is transmitting and adjusted for maximum power the aerial may be disconnected or the output short-circuited in either case without damage being caused to any part of the equipment.

6. *Receiver.*—(1) The receiver shall be a fixed tune receiver which shall be capable of receiving type A2 waves over the frequency band 490 to 510 kc/s when used with headphones.



(2) Headphones which are shrouded to exclude external noises shall be provided and shall be permanently attached to the receiver.

(3) The receiver shall comply with the requirements of sub-paragraph (4) of this paragraph when tested in the following manner:—

(a) artificial aerials shall be used and shall consist of either:—

(i) a 15 ohms resistor in series with a capacitor having any value between the minimum capacitance of the aerial referred to in sub-paragraph (1) of paragraph 3 of this Part of this Schedule and 150 picofarads, or

(ii) a 30 ohms resistor in series with a capacitor of any value within the range 350 to 450 picofarads;

(b) the signals used shall be type A2 signals modulated to a depth of 30 per cent at 400 c/s.

(4) Over the normal range of handle speeds:—

(a) the standard audio-frequency output of the receiver into a resistance substantially equal to the modulus of the impedance of the telephone receivers at 1,000 c/s shall be one milliwatt;

(b) the selectivity preceding the final detector of the receiver shall comply with the following table:—

Frequency	Requirement
490 to 510 kc/s .. .. .	Response to be uniform to within 6 decibels over the range.
Below 460 kc/s .. .. .	} At least 40 decibels discrimination relative to the response at 500 kc/s to be obtained at all frequencies.
Above 540 kc/s .. .. .	

(c) the audio-frequency response of the receiver shall be uniform to within 6 decibels over the range of modulation frequencies 400 to 1,400 c/s and shall substantially fall for frequencies outside this range;

(d) the standard output specified in sub-paragraph (a) shall be obtained with a test signal input not exceeding 40 decibels above one microvolt on a frequency of 500 kc/s;

(e) with the test signal specified in sub-paragraph (d) the signal noise ratio shall be at least 15 decibels.

## SIXTH SCHEDULE

(Rule 15)

TOOLS, MEASURING INSTRUMENTS, SPARE PARTS, ETC.

### PART I—TOOLS

- 1 contact burnisher;
- 1 6 in. smooth file;
- 1 jointing knife;
- 1 pair 7 in. wireman's insulated pliers;
- 1 pair 6 in. long nose pliers with side cutters;
- 1 insulated screwdriver, not less than 8 in. in length, with  $\frac{1}{4}$  in. blade;

- 1 insulated grub screwdriver with  $\frac{1}{8}$  in. blade ;
- 1 watch screwdriver with  $\frac{1}{16}$  in. blade ;
- 1 set of spanners, sizes 0, 2, 4, and 6 B.A. ;
- 1 spanner adjustable to 1 in. nuts ;
- \* 1  $\frac{1}{4}$  in. hand drill ;
- \* 1 set of high-speed twist drills, sizes  $\frac{3}{16}$  in., 26, 34 and 44 ;
- 1 clamp vice ;
- 1 electric soldering iron to suit ship's voltage with a power consumption of not less than 40 watts or more than 70 watts ;
- 1 dusting brush ;
- 1  $\frac{1}{2}$  lb. ball-pane hammer ;
- A tool box or compartment for containing the foregoing tools and capable of being locked.

#### PART II.—MEASURING INSTRUMENTS

- 1 hydrometer ;
- 1 dipping fahrenheit thermometer ;
- An ammeter capable of measuring direct current from 1 milliampere to 500 milliamperes ; a voltmeter capable of measuring direct current voltage from 75 millivolts to 500 volts and alternating current voltage from 150 millivolts to 500 volts ; and an ohm-meter capable of measuring resistance from 10 ohms to 20,000 ohms ; provided that a measuring instrument in which the requirements for an ammeter, a voltmeter and an ohm-meter specified above are combined may be substituted for the said instruments.

#### PART III.—SPARE PARTS AND SPARE EQUIPMENT

- 1 set of brushes for each machine installed ;
- 2 cartridges for each cartridge fuse in use ;
- 1 set of key contacts for each type of key in use ;
- 1 main aerial made up (wire only) ;
- 50 per cent of the number of insulators in use (excluding leading insulators) ;
- 100 per cent of the number of shackles and thimbles in use ;
- 12 bulldog grips to suit the aerial wire ;
- 1 set of telephones and leads (with plugs if used) for each type of telephone lead in use ;
- 1 valve for each two of the first six of each type of valve in use and then 1 valve for each additional 3 valves or part of 3 valves of that type in use
- 3 vibrators for each type of vibrator in use ;
- 1 indicator lamp for each indicator lamp in use ;
- 6 mica discs for spark gap } If used in the radiotelegraph installation ;
- 1 pressure disc
- 1 emergency lamp ;
- 1 charging mat if a mat-type charging unit is in use ;
- 2 charging lamps for each type of charging lamp in use ;
- 1 rectifier if a rectifier-type charging unit is in use.

#### PART IV.—MISCELLANEOUS ITEMS

- 4 ozs. petroleum jelly ;
- 3 sheets glass paper ;
- 8 ozs. resin-cored solder ;
- 4 ozs. insulating tape ;

- $\frac{1}{2}$  pint lubricating oil ;
- $\frac{1}{2}$  lb. grease suitable for machine in use ;
- 4 ozs assorted fuse wire, 1 ampere, 5 ampere and 15 ampere ;
- 1 length of aerial wire equal to the length of the emergency aerial plus 10 feet (uncut) ;
- 6 yards flexible wire (5 amperes) for adjustable connections ;
- 4 ozs, copper binding wire ;
- 4 ozs. trichloroethylene.

\* These items need not be provided in ships other than those engaged on international voyages.

## SEVENTH SCHEDULE

(Rule. 17)

### AUTO-ALARM

#### 1. GENERAL.—(1) The auto-alarm shall :—

(a) include a receiver, a selector, a test signal generator and an audible alarm system ;

(b) be capable of giving audible warning of the receipt of an alarm signal consisting of a series of 12 consecutive dashes, each with a duration of 4 seconds and separated by intervals of one second in each case subject to the tolerances specified in paragraph 3 of this Schedule ;

(c) be capable of being rapidly connected with the main aerial referred to in Rule 12 of these Rules or to an equally efficient aerial ;

(d) comply with the requirements of this Schedule notwithstanding variations of the supply voltage of :—

(i) plus 5 per cent or minus 10 per cent if the equipment is operated from the emergency source of electrical energy required by paragraph (2) of Rule 14 of these Rules or from batteries ; or

(ii) plus or minus 10 per cent if the equipment is operated from the main source of electrical energy required by paragraph (1) of the said Rule.

(2) The receiver, selector and test signal generator shall be installed in a radiotelegraph room.

(3) The auto-alarm shall be provided with a switch or system of switches by which it may be connected to the ship's main aerial or to an equally efficient aerial ; or

(4) The auto-alarm shall include a manual re-setting device to enable the selector to be re-set after the audible alarm system has been actuated.

2. RECEIVER.—(1) The receiver forming part of the auto-alarm shall be capable of receiving type A2 waves and type B waves in each case on all note frequencies between 400 c/s and 1,400 c/s and on all carrier waves of a frequency between 492 kc/s to 508 kc/s.

(2) All tuning controls and gain controls which affect the operation of the receiver as part of the auto-alarm shall be pre-set and shall not be capable of operation from the outside of the auto-alarm.

(3) The receiver shall comply with the requirements of sub-paragraphs (4) to (7), inclusive, of this paragraph when tested in the following manner, except where another method of testing is specified in the said sub-paragraphs :—

(a) an artificial aerial shall be used for the test and shall consist of a 10 ohm resistor in series with a capacitor having any value between 300 and 750 picofarads ;

(b) type A2 signals used in the test shall be modulated to a depth of 70 per cent and shall have a note frequency of 400 c/s ;

(4) The selectivity of the receiver shall be such that :—

(a) the radio-frequency response is uniform to within 3 decibels in a frequency range 492 to 508 kc/s ;

(b) the total variation of audio-frequency response is not more than 3 decibels in the case of note frequencies in the range 400 to 1,400 c/s ;

(c) the audio-frequency response falls rapidly in the case of note frequencies below 400 c/s and above 1,400 c/s ; and

(d) the auto-alarm gives response to an alarm signal of a frequency of 500 kc/s and an input level of 40 decibels above one microvolt, in the presence of another signal having the following characteristics ;

Type of wave	Modulation frequency	Depth of modulation	Carrier frequency	Input Level (decibels about one microvolt)
Continuously modulated	All audio-frequencies in the range 50 c/s to 1,400 c/s	70 per cent	Below 470 kc/s and above 530 kc/s	80
			Below 450 kc/s and above 550 kc/s	120

(5) (a) The sensitivity of the receiver shall for the purposes of this paragraph, be taken to be the minimum input level of the test alarm signal injected at a frequency of 500 kc/s which will operate the selector. The sensitivity of the receiver shall be such that the selector will operate by the injection of an alarm signal from the test signal generator forming part of the auto-alarm.

(b) The receiver shall be provided with an automatic gain control which shall :—

(i) during periods when the selector is continuously in operation, steadily reduce the sensitivity of the receiver at a rate within the range 7.5 to 15 decibels per minute in the case of a range of sensitivity of 40 to 80 decibels above one microvolt notwithstanding that the input level of an injected signal is at any level above the minimum necessary to operate the selector ;



(ii) during periods when the selector is not continuously in operation, steadily increase the sensitivity of the receiver to a maximum level of between 35 and 40 decibels above one microvolt at a range of sensitivity of 40 to 80 decibels above one microvolt notwithstanding that the input level of an injected signal is at any level below the level corresponding to the threshold of selector release.

(6) The automatic gain control when morse interference is simulated by continuous keying of a test signal of a frequency of 500 kc/s and an input level of 100 decibels above one microvolt with a mark-to-space ratio of 19 to 1, and variation of frequency of interruption is obtained by varying the speed of transmission, shall be such that :—

(a) when such test signal produces three interruptions per second, the sensitivity of the receiver is not reduced below that necessary for the reception of a signal of an input level of 40 decibels above one microvolt ; and

(b) when the speed of such test signal is arranged so that there are three interruptions per period of 2 seconds the sensitivity of the receiver is so reduced after operating for a period of 15 minutes that a signal of at least 70 decibels above one microvolt is required to operate the selector.

(7) If, in addition to the automatic gain control, a pre-set manual control of receiver gain is provided the range of sensitivity variations provided by that control shall be not more than 10 decibels.

(8) The receiver shall be such that the auto-alarm will respond to a test alarm signal transmitted on any frequency in the range 492 kc/s to 508 kc/s and at an input level of 50 decibels above one microvolt in the presence of an interfering signal with the following characteristics :—

Type of signal	Depth of modulation	Modulation frequency	Input level	Speed of transmission
Type A2..	70 per cent	400 c/s- 1,400 c/s	120 decibels above one microvolt	15-40 words transmission

(9) The receiver shall be such that it will not operate the selector upon the simultaneous injection of any two continuous carrier waves of which the frequency difference or sum falls within the range 492 kc/s, being waves with the following characteristics :—

Frequency	Input level	Modulation
Outside the range 450 kc/s to 550 kc/s	120 decibels above one mi- crovolt	One unmodulated and the other modulated to a depth of 70 per cent at any audio-fre- quency in the range 400 c/s to 1,400 c/s.

(10)—(a) The receiver shall not in normal service produce a field exceeding 0.1 microvolt per metre when measured at a distance of one mile from the receiver, unless the test signal generator is in operation.

(b) The receiver shall be deemed to comply with the requirements of sub-paragraph (a) of this paragraph if, when :—

(i) the receiver is placed centrally in a screened earthed enclosure of dimensions at least 6 feet cube ;

(ii) the earth terminal of the receiver is connected to the inside of the screen ;

(iii) the aerial terminal of the receiver is connected through an un-screened search coil situated within the said enclosure and of dimensions one foot square and an unscreened lead to a resistive measuring instrument mounted outside the enclosure and having its other terminal earthed ; and

(iv) the receiver is energised,

the power measured by the measuring instrument does not exceed  $4 \times 10^{-10}$  watts whatever the resistance of the measuring instrument or the adjustment of the receiver, and notwithstanding that the search coil is short-circuited or moved in any way without approaching within 6 inches of the receiver case.

3. SELECTOR—(1) The selector, in conjunction with the receiver shall be capable of :—

(a) accepting :—

(i) dashes of a duration within the tolerances 3.5 to 6.0 seconds

(ii) spaces between dashes, being spaces of a duration within the tolerances 0.01 to 1.5 seconds ; and

(b) rejecting :—

(i) dashes of a duration of less than 3.4 seconds ;

(ii) dashes of a duration of more than 6.2 seconds ; and

(iii) spaces between dashes, being spaces of a duration of more than 1.6 seconds.

(2) The selector, after accepting three or four consecutive dashes of the alarm signal, shall actuate the audible alarm system.

(3) Any timing controls provided as part of the selector shall be pre-set and shall not be capable of being operated from the outside of the equipment.

4. TEST SIGNAL GENERATOR.—(1) The test signal generator shall be capable of :—

(a) generating, for purposes of test, a signal with the following characteristics :—

(i) Frequency—500 kc/s ;

(ii) Type of wave—A2.

(iii) Depth of modulation—within the range 70 to 100 per cent.

(iv) Modulation frequency—within the range 400 to 1,400 c/s ;

(v) Input level—equivalent to a voltage modulated to a depth of 70 per cent within the range 37 to 43 decibels above one microvolt in series with the artificial aerial ; and

(b) injecting into the receiver the alarm signal specified in paragraph 1 (b) of this Schedule within the tolerances specified in sub-paragraph (1) (a) of paragraph 3 of this Schedule and the characteristics specified in the foregoing provisions of this paragraph, both by means of :—

- (i) a manual key of a non-locking type, and
- (ii) the automatic keying device specified in Part V of the Second Schedule to these Rules.

(2) The method of injection shall be such that the test alarm signal will not operate the audible alarm system when the aerial is disconnected.

(3) The test signal generator shall be so designed and constructed that the input level of the signal specified in sub-paragraph (1) (a) of this paragraph can be increased by approximately 20 decibels by means of a non-locking switch.

5. AUDIBLE ALARM SYSTEM.—(1) The audible alarm system shall consist of three alarm bells installed respectively in a radiotelegraph room, on the bridge and in the sleeping room of a radio officer. The bells shall be operated from the source of electrical energy required by paragraph (2) of Rule 14 of these Rules by means of a power circuit taken from an unfused circuit, and so fused that the efficiency of the audible alarm system will not be affected by the rupture of any fuse other than a fuse forming part of that system. The power circuit shall be controlled by a locking switch situated on or near to the receiver forming part of the auto-alarm, and clearly and permanently marked to indicate its purpose.

(2) Subject to the provisions of sub-paragraph (3) of this paragraph the alarm bells shall, whenever the auto-alarm is in operation as such, give an alarm :—

(a) when actuated by the selector ; and

(b) within 15 seconds after any failure for 9 seconds (subject to tolerance plus or minus 6 seconds) of :—

(i) the direct-current voltage feeding the anode of any valve of the receiver forming part of the auto-alarm, if the receiver is not provided with a vibrator ;

(ii) any vibrator forming part of the receiver ;

(iii) a circuit of a filament of any directly-heated valve forming part of the receiver if it is operated from the main source of electrical energy required by paragraph (1) of Rule 14 of these Rules ; and

(iv) any continuously rotating mechanism forming part of a selector operated from the said main source of electrical energy ;

(c) within 15 seconds after any failure of :—

(i) a circuit of a filament of a directly-heated valve forming part of the receiver if it is operated from batteries ;

(ii) any continuously rotating mechanism forming part of a selector operated from batteries.

(3) A device shall be provided which will enable the bells situated on the bridge to be disconnected from the aforesaid power circuit. The device may include means for so disconnecting the bell situated in the radio officer's sleeping room. The device shall be non-locking, and shall not be capable of disconnecting the bell in the radiotelegraph room. The device shall be clearly and permanently marked to indicate its purpose.

6. FIELD TEST.—If the auto-alarm is in operation for a period of 28 days in connection with an aerial having an effective height of not less than 10 metres and situated at any point within 3 miles of the coast of Nigeria the auto-alarm shall not be actuated during that period by signals other than :—

- (a) signals locally generated to test the auto-alarm ; and
- (b) signals within the tolerances specified in sub-paragraph (1) (a) of paragraph 3 of this Schedule.

7. AUTO-ALARM USED AS AN EMERGENCY RADIOTELEGRAPH RECEIVER.—If the auto-alarm is intended to be used as an emergency radiotelegraph receiver it shall, in addition to complying with the foregoing requirements of this Schedule, comply with the following requirements :—

(1) The receiver forming part of an auto-alarm shall be capable of :—

(a) headphone reception and loudspeaker reception of the waves specified in sub-paragraph (1) of paragraph 2 of this Schedule ;

(b) operation from :—

(i) the main source of electrical energy required by paragraph (1) of Rule 14 of these Rules ; and

(ii) the emergency source of electrical energy required by paragraph

(2) of Rule 14 of these Rules ;

(2) The receiver shall be provided with :—

(a) a built-in switch for changing operation of the receiver from the main source of electrical energy to the emergency source of electrical energy ; and

(b) a manual gain control so arranged that the performance of the auto-alarm as such is not impaired at any setting of the control.

(3) The standard audio-frequency output level of the receiver shall be :—

(a) for headphone reception, 10 decibels below one milliwatt into a resistance substantially equal to the modulus of the impedance of the telephone receivers at 1,00 c/s ; and

(b) for loud-speaker reception, 17 decibels above one milliwatt into a resistance which loads the output valve with the load appropriate to the valve.

(4) The sensitivity of the receiver shall be such that when measured with a signal interrupted in the manner specified in sub-paragraph (6) (a) of paragraph 2 of this Schedule and modulated to a depth of 30 per cent the standard audio-frequency output level shall be obtained with a signal input not exceeding 40 decibels above one microvolt.

(5) When the manual gain control is adjusted to give the standard audio-frequency output of the receiver with the signal input specified in sub-paragraph (4) of this paragraph, the signal/noise ratio shall be at least 20 decibels.

(6) The receiver shall comply with sub-paragraph (10) of paragraph 2 of this Schedule when used with unscreened headphones.



## EIGHTH SCHEDULE

(Rules 19 &amp; 28)

## TABLE OF WATCH HOURS

Zones (1)	Western Limits (2)	Eastern Limits (3)	Hours of Watch (Greenwich Mean Time)	
			16 hours (4)	8 hours (5)
A.—Eastern Atlantic Ocean	Meridian of 30° W., Coast of Greenland.	Meridian of 30° E., to the South of the Coast of Africa, Eastern limits of the Mediterranean of the Baltic, 30 E. to the North of Norway.	From To 0h. 6h. 8h. 14h. 16h. 18h. 20h. 22h.	From To 8h. 10h. 12h. 14h. 16h. 18h. 20h. 22h.
B.—Western Indian Ocean Eastern Arctic Sea	Eastern Limit of Zone A.	Meridian of 80° E., West Coast of Ceylon to Adams Bridge thence westward round the coast of India	0h. 2h. 4h. 10h. 12h. 14h. 16h. 18h. 20h. 24h.	4h. 6h. 8h. 10h. 12h. 14h. 16h. 18h.
C.—Eastern Indian Ocean, China Sea, Western Pacific Ocean	Eastern Limit of Zone B.	Meridian of 160° E.	0h. 6h. 8h. 10h. 12h. 14h. 16h. 22h.	0h. 2h. 4h. 6h. 8h. 10h. 12h. 14h.
D.—Central Pacific Ocean	Eastern Limit of Zone C.	Meridian of 140° W.	0h. 2h. 4h. 6h. 8h. 10h. 12h. 18h. 20h. 24h.	0h. 2h. 4h. 6h. 8h. 10h. 20h. 22h.
E.—Eastern Pacific Ocean	Eastern Limit Zone D.	Meridian of 90° W. as far as the Coast of Central America then the West Coast of Central America and North America.	0h. 2h. 4h. 6h. 8h. 10h. 16h. 22h.	0h. 2h. 4h. 6h. 16h. 18h. 20h. 22h.
F.—Western Atlantic Ocean and Gulf of Mexico	Meridian of 90° W., Gulf of Mexico, East Coast of North America.	Meridian of 30° W., Coast of Greenland	0h. 2h. 4h. 10h. 12h. 18h. 20h. 22h.	0h. 2h. 12h. 14h. 16h. 18h. 20h. 22h.

NINTH SCHEDULE  
FORM OF RADIOTELEGRAPH LOG-BOOK  
\* RADIOTELEGRAPH LOG  
PART I

(Rule, 22)

Name of Ship	Official Number and International Call Sign	Port of Registry	Gross Tonnage

Name of Company operating the Radio Service.....

Port at which and date when voyage commenced	Nature of the voyage or employment	Port at which and date when voyage terminated
Date .....		Date .....
Port .....		Port .....

Delivered to the Superintendent of the Mercantile Marine Office at the  
Port of ..... on the ..... day,  
..... 19..... together with Radiotelegraph  
Log Part II, serial numbers ..... to.....  
..... Countersigned ..... Master  
..... Superintendent ..... Address

## SECTION A—PARTICULARS OF RADIO STAFF

Name	Home Address	Certificate Number and class

## SECTION B—PARTICULARS OF BATTERIES ON BOARD

Battery Number	Number of	Type	Date Supplied	Voltage and Ampere-hour	Purpose for which used

## SECTION C—DAILY EXAMINATION OF BATTERIES

Date	Battery Number	Voltage off Load	Voltage on Load	Remarks

## SECTION D—MONTHLY REPORT OF BATTERIES

Date	Battery Number and Cell Number	Specific Gravity as measured		Remarks	Date	Battery Number and Cell Number	Specific Gravity as measured		Remarks
		Before charge	After charge				before charge	after charge	

RADIOTELEGRAPH LOG  
PART II

Name of Ship	Official Number and International Call Sign	Port of Registry	Gross Tonnage

Serial Number ..... from ..... to .....

Name of Company operating the Radio Service

S.S.  
M.V.

## DIARY OF THE RADIOTELEGRAPH SERVICE

<i>Date and Time (G.M.T.)</i>	<i>Station From</i>	<i>Station To</i>	<i>Full Details of Calls, Signals and Distress Working as prescribed by Rule 22</i>	<i>Frequency</i>

## TENTH SCHEDULE

(Rule 30)

FORM OF RADIOTELEPHONE LOG BOOK  
RADIOTELEPHONE LOG

<i>Name of Ship</i>	<i>Official Number</i>	<i>Port of Registry</i>	<i>Gross Tonnage</i>

Name of Company operating the Radio Service.....

period covered by Log—From ..... To .....  
Delivered to the Superintendent of the Mercantile Marine Office at the

Port of ..... on the ..... day of.....

19.....

Countersigned ..... Master  
..... Superintendent ..... Address

## SECTION A—PARTICULARS OF RADIOTELEPHONE OPERATORS

<i>Name</i>	<i>Home Address</i>	<i>Certificate Number and Class</i>

S.S.  
M.V.

## SECTION B—DIARY OF THE RADIOTELEPHONE SERVICE

<i>Date and Time (G.M.T.)</i>	<i>Station From</i>	<i>Station To</i>	<i>Frequency Used</i>	<i>Record of Working, as prescribed by Rule 30</i>



## ELEVENTH SCHEDULE

(Rule 1 (5))

## DIRECTION-FINDER

## TRANSITIONAL PROVISIONS

1. Any ship which is provided with a direction-finder which was installed in the ship before 19th November, 1954 shall not be required to comply with the requirements of Rules 35 and 36 of these Rules if the direction finder—

(a) complies with such of the requirements of the United Kingdom Merchant Shipping (Wireless Telegraphy) Rules, 1938, as would have been applicable to it had the said Rules not been revoked, and

(b) is capable of

(i) receiving type A1, A2 and B waves on all frequencies from 255 kc/s to 525 kc/s; and

(ii) taking radio bearings when the field strength at the loop aerial system is as low as 50 microvolts per metre.

## TWELFTH SCHEDULE

(Rule 3)

## DIRECTION-FINDER EQUIPMENT

1. GENERAL.—The direction-finder shall include a receiver and a loop aerial system. For the purposes of this Schedule (except paragraph 10 (2) thereof) any goniometer forming part of the direction-finder shall be deemed to be part of the loop aerial system. The loop aerial system other than ball bearings, hose clips, set screws and other similar small parts, shall consist of non-magnetic material.

2. CAPABILITY.—The direction-finder shall be capable of headphone reception of waves of type A1, type A2 and type B of any frequency within the range of 255 kc/s to 525 kc/s so as to enable the radio bearing and sense of the signal to be determined by reference to the minimum strength thereof.

3. CONTROLS.—The receiver shall be provided with

- (1) a radio-frequency gain control;
- (2) a tuning control;
- (3) a tuning scale in which, at no point in the running range, an interval of  $\frac{1}{8}$  inch corresponds to a frequency change of more than 8 kc/s.

4. GENERAL METHOD OF TESTING.—The receiver shall comply with the requirements of paragraphs 5 to 12 inclusive, and 16 of this Schedule when tested in the following manner on any frequency within the range 255 kc/s to 525 kc/s:—

(1) Signals (in this Schedule referred to as "locally generated signals") shall be obtained from one or more signal generators.

(2) Locally generated signals shall be injected through a network in such manner that the signal generator or generators, as the case may be, and the network are together equivalent to a constant voltage generator in series with an impedance substantially equal to the impedance of the loop aerial system at the test frequency, when

(a) the loop aerial system is adjusted for the determination of radio bearings;

(b) the sense-finder is not in operation ; and

(c) the impedance is measured between the two terminals to which the receiver is normally connected.

(3) The effective height ( $h_e$ ) in metres of the loop aerial system shall be the ratio  $E/e$ , where  $E$  is the voltage produced by a vertically polarised field of strength  $e$  volts per metre, when

(a) the loop aerial system is adjusted for the determination of bearings and for maximum pick-up ;

(b) the sense-finder is not in operation ;

(c) the receiver is not connected to the loop aerial system and

(d) the voltage is measured between the terminals of the loop aerial system to which the receiver is normally connected.

(4) The standard input level shall be the input level obtained when the electromotive force of the equivalent signal generator referred to in subparagraph (2) of this paragraph is 50  $h_e$  microvolts root mean square.

(5) The standard output level shall be an audio-frequency output of one milliwatt into a resistance substantially equal to the modulus of the impedance of the telephone receivers at 1,000 c/s.

(6) The signal-noise ratio of the direction-finder shall be determined either

(a) by using vertically polarised waves for transmission of the input signals, and with the loop aerial system arranged for the determination of bearings and adjusted for maximum pick-up without the sense-finder in operation or

(b) by using locally generated signals applied to the receiver only in the manner specified in subparagraph (2) of this paragraph.

5. SIGNAL AND INTERMEDIATE FREQUENCY SELECTIVITY.—The signal frequency selectivity of the receiver, or in the case of a superheterodyne receiver the signal and intermediate frequency selectivity shall satisfy the following requirements :—

(a) The minimum bandwidth for 6 decibels discrimination shall be 2 kc/s.

(b) The maximum bandwidth in relation to discrimination shall be as follows :—

Discrimination	30 decibels	60 decibels	90 decibels
Bandwidth	8 kc/s	16 kc/s	35 kc/s

At any frequency outside the bandwidth of 35kc/s specified in (b) the discrimination shall not be less than 90 decibels except in the case of superheterodyne receivers, where at the image frequency the discrimination shall not be less than 80 decibels.

#### 6. GAIN.—When

(a) the input terminals of the receiver are closed solely through an external impedance substantially equal to that of the loop aerial system at the test frequency,

(b) the sense-finder is not in operation and

(c) impedance is measured between the two terminals of the loop aerial system to which the receiver is normally connected,

the gain of the receiver shall be such that receiver noise can produce an output level of minus 10 decibels relative to the standard output level at any frequency within the range of frequencies specified in paragraph 2 of this Schedule.

#### 7. SIGNAL/NOISE RATIO.—

(1) When

(a) the note filter (if any) is switched out of circuit,

(b) a type A1 signal is injected at the standard input level and

(c) the receiver gain is manually adjusted to give the standard output level, the signal/noise ratio shall not be less than 20 decibels.

(2) When

(a) the note filter (if any) is switched out of circuit,

(b) a type A2 signal modulated to a depth of 30 per cent., with a note frequency of 400 c/s is injected at the standard input level, and

(c) the receiver gain is manually adjusted to give the standard output level, the signal/noise ratio shall not be less than 10 decibels.

(3) For the purposes of this paragraph spurious whistles shall be regarded as noise.

8. BLOCKING.—The change in output of the receiver shall not exceed 3 decibels at any frequency within the range of frequencies specified in paragraph 2 of this Schedule, and at all levels of wanted signal up to 50 decibels above the standard input level, whether of type A1 or type A2, when locally generated signals of type A1 or type A2 at a level of 40 decibels above the level of the wanted signal and spaced 10 kc/s from the carrier of the wanted signal are applied.

9. INTERMODULATION.—The input level of two unwanted signals shall not be less than plus 75 decibels relative to the standard input level when:

(a) the receiver is adjusted to give standard output level with a locally generated wanted signal of standard output level modulated to a depth of 30 per cent., with a note frequency of 400 c/s at any frequency within the range of frequencies specified in paragraph 2 of this Schedule;

(b) the input wanted signal has been removed; and

(c) two unwanted locally generated signals each of any frequency which is not less than 50 kc/s from the frequency of the wanted signal but whose frequency sum or frequency difference is equal to the frequency of the wanted signals, one signal being modulated to a depth of 30 per cent. with a note frequency of 400 c/s and the other signal being unmodulated, are simultaneously applied at equal input levels so as to give an output equal to that previously obtained with the wanted signals.

10. RADIATION.—(1) The direction-finder shall not in normal service produce a field exceeding 0.1 microvolt per metre when measured at a distance of one mile from the receiver.

(2) The receiver, including the goniometer, if any, shall be deemed to comply with the requirement of sub-paragraph (1) of this paragraph if, when

(a) the receiver without the aerial system is placed centrally in a screened earthed enclosure of dimensions at least six feet cube,

(b) the earth terminal is connected to the inside of the screen,

(c) each aerial terminal in turn is connected through an unscreened four-turn rectangular search coil situated within the said enclosure and of dimensions one foot square and an unscreened lead to a resistive measuring instrument mounted outside the enclosure, having its other terminal earthed ;

(d) the aerial terminal or terminals of the receiver, other than the terminal connected to the aforesaid measuring instrument, are earthed one at a time or in any combination or remain unearthed or are interconnected in any combination and

(e) the receiver is energised and unscreened headphones are connected thereto,

the power measured by the said measuring instrument when connected in the manner specified in (c) of this paragraph, does not exceed  $4 \times 10^{-10}$  watts whatever the resistance of the measuring instrument or the adjustment of the receiver notwithstanding that the search coil be short-circuited or moved in any way provided that it does not approach within 6 inches of the receiver case.

11. TUNING DRIFT AND STABILITY.—(1) After the receiver has been switched on for 5 minutes and tuned to any frequency within the frequency range specified in paragraph 2 of this Schedule the tune frequency shall not change by more than one part in one thousand in any period of 5 minutes.

(2) a change of 5 per cent in any one of the supply voltages to the receiver, or to a power unit associated therewith, shall not cause the tune frequency to change by more than three parts in ten thousand ; and

(3) a change of ambient temperature of 5°C within the range of 0°C to 50°C applied after the receiver has been switched on for one hour shall not cause the tune frequency to change by more than one in one thousand.

12. HETERODYNE NOTE STABILITY.—The heterodyne note stability of the receiver shall be such that

(1) the frequency of a heterodyne note which is initially one kilocycle per second shall not vary by more than 100 c/s when an input signal is increased over the range of levels from 0 to 60 decibels above the standard input ; and

(2) at all input levels within the range specified in sub-paragraph (1) of this paragraph a beat note of 200 c/s can be obtained by tuning either towards or away from zero beat.

13. ACCURACY OF BEARINGS.—When the direction-finder is tested using type A2 waves modulated to a depth of from 80 per cent to 100 per cent and with a vertically polarised field having a level of 40 decibels relative to one



microvolt per metre, the bearings indicated by the scale of the direction-finder shall, at all frequencies in the range of frequencies specified in paragraph 2 of this Schedule, throughout the whole 360 degrees of azimuth and after due allowance has been made for any site errors, be correct within plus or minus one degree of the true bearing.

14. QUALITY OF MINIMA.—When the direction-finder is arranged for the taking of bearings and is tested under the conditions specified in paragraph 13 of this Schedule, but with a field strength sufficient to give a signal/noise ratio of at least 50 decibels with the loop aerial system adjusted for maximum output, changes in the setting of the bearing indicator 5 degrees and 90 degrees in either directions from the position or positions of minimum output shall, at all frequencies in the range of frequencies specified in paragraph 2 of this Schedule, cause the audio-frequency output to increase by not less than 18 decibels and not less than 35 decibels respectively.

15. EFFICIENCY OF SENSE-FINDER. When

(a) the equipment is adjusted for the determination of sense and is tested under the conditions specified in paragraph 13 of this Schedule but with a field strength sufficient to give a signal noise ratio of at least 50 decibels with the loop aerial system adjusted for maximum output, and

(b) the sense indicator is adjusted to indicate any bearing within plus or minus 10 degrees of the true bearing,  
the audio-frequency output level of the receiver due to the wanted signal shall be at least 20 decibels below the output level that is obtained when the sense indicator is adjusted to indicate any bearing within  $180 \pm 10$  degrees of the true bearing.

16. FIDELITY.—The maximum change in level of the output of the receiver shall be less than 8 decibels when the modulation frequency of an input signal of constant level and modulation depth is varied continuously from 300 c/s to 1,500 c/s. For the purposes of this paragraph the output of the receiver shall not exceed the standard output level and the input signal shall be applied at any level in the range from the standard input level to 50 decibels above that level.

### THIRTEENTH SCHEDULE

(Rule 4)

#### DIRECTION-FINDING EQUIPMENT

#### CLIMATIC AND DURABILITY TESTS

1. In this Schedule :

(1) References to Class B equipment shall be construed as references to each part of the direction-finder other than the loop aerial system.

(2) References to Class X equipment shall be construed as references to the loop aerial system.

2. The tests referred to in paragraphs 2 to 10 inclusive of the fourth Schedule to these Rules shall apply to direction-finding equipment.

TABLE

Nature of Test							Class of Equipment	
(1) Vibration test ..	..	..	..	..	..	..	B	X
(2) Bump test ..	..	..	..	..	..	..	B	X
(3) Dry heat test ..	..	..	..	..	..	..	B	X
(4) Damp heat test ..	..	..	..	..	..	..	B	X
(5) Low temperature test ..	..	..	..	..	..	..	B	X
(6) Rain test ..	..	..	..	..	..	..		X
(7) Immersion test ..	..	..	..	..	..	..		X
(8) Corrosion test—salt water ..	..	..	..	..	..	..	B	X
(9) Corrosion test—acid fumes (if a battery is included in the equipment) ..	..	..	..	..	..	..	B	X
(10) Mould growth test ..	..	..	..	..	..	..		X

## FOURTEENTH SCHEDULE (Rule 13 (c))

## CERTIFICATE OF CALIBRATION OF DIRECTION-FINDER

We, the undersigned, hereby certify that we have this day

(a) calibrated in accordance with the Merchant Shipping (Direction-Finders) Rules, 1964 the direction-finder installed in the s.s./M.V. \_\_\_\_\_

(b) handed to the Master of that ship tables of calibration corrections.

(c) adjusted the said direction-finder so that the readings taken thereby, when corrected with such tables differed from the correct bearings by no more than plus or minus two degrees.

We hereby further certify that the Master of the said ship has been furnished with a list or diagram indicating the conditions, and position, at the time of such calibration, of the aerials and of all moveable structures on board the ship which might effect the accuracy of the direction-finder.

..... Radio Observer

..... Visual Observer

..... Date

# FIFTEENTH SCHEDULE

RECORD OF CHECK-BEARINGS TAKEN BY MEANS OF THE DIRECTION-FINDER

(Rule 13 (d))

(1)	Serial Number of Bearings	
(2)	Date	
(3)	Times (G.M.T.)	
(4)	Latitude	Ship's Approximate Position
(5)	Longitude	
(6)	Distance from Transmitter	
(7)	Direction-Finder Bearing of (Name)	
(8)	Direction-Finder relative Bearing Corrected for Q.E.	
(9)	Ship's Head by Compass 0/360°	
(10)	Total Compass Error	
(11)	± Convergency Applied	
(12)	Ship's Head Corrected (True)	
(13)	True Bearing by Direction-Finder [Col. (8) and Col. (12) ]	
(14)	True Bearing by Calculation or by Visual check (whether calculated or Visual to be indicated)	
(15)	Correction required to make Col. (13) equal Col. (14) (indicating whether - or + )	
(16)	Signature of Observer or Observers	

MADE at Lagos this 11th day of June, 1964.

R. A. NJOKU,  
*Minister of Transport*

EXPLANATORY NOTE

These Rules arrange sea-going ships into classes and regulate the radio and radio direction-finding installations to be provided in each class of ship. The Rules include such requirements as appear to the Minister to implement the provisions of the International Convention for the Safety of Life at Sea, 1948, relating to radiotelegraphy, radiotelephony and direction-finders.



THE MERCHANT SHIPPING (CREW ACCOMMODATION)  
REGULATIONS, 1964

ARRANGEMENT OF REGULATIONS

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2. Interpretation.
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4. Plans.
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11. Heating.
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17. Sleeping rooms.
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19. Furniture and fittings in sleeping rooms.
20. Mess rooms.
21. Furniture and fittings in mess rooms.
22. Recreation spaces and studies.
23. Office accommodation.
24. Washing accommodation.
25. Supply of water to washing accommodation.
26. Supply of drinking water.
27. Laundry facilities, etc.
28. Water closets.
29. Galleys.
30. Dry provision store rooms.
31. Cold store rooms and refrigerating equipment.

32. Hospitals.
33. Medical cabinet.
34. Protection from mosquitoes.
35. Maintenance and inspection of crew accommodation.
36. Inspection by a surveyor of ships.
37. Fees.
38. Accommodation shared with passengers.
39. Additional exemptions.
40. Non-deductible spaces.

FIRST SCHEDULE—Trunked mechanical ventilation.

SECOND SCHEDULE—Deck sheathings.

THIRD SCHEDULE—Insulating material for the underside of decks.

FOURTH SCHEDULE—Marking.

## MERCHANT SHIPPING ACT, 1962

The Merchant Shipping (Crew Accommodation)  
Regulations, 1964*Commencement : 25th June, 1964*

In exercise of the powers conferred by sections 101 and 427 of the Merchant Shipping Act, 1962, the Federal Minister of Transport hereby makes the following Regulations—

1. These Regulations may be cited as the Merchant Shipping (Crew Accommodation) Regulations, 1964, and shall apply to all Nigerian sea-going ships except fishing boats and pleasure yachts.

Short title  
and  
application.

2. In these regulations, unless the context otherwise requires—

Interpre-  
tion.

“apprentice” includes a Cadet and a Midshipman ;

“Chief Officer” includes a first Mate and an only Mate ;

“crew” means seamen and apprentices ;

“sanitary accommodation” means washing accommodation and accommodation containing water closets or urinals ;

“trunked mechanical ventilation system” means a system of ventilation complying with the specifications set forth in the First Schedule to these regulations ;

“washing accommodation” does not include—

(a) any sleeping room or hospital ward whether or not provided with a wash-basin, bath or shower ; and

(b) any room appropriated for use only as a laundry.

“whale catcher” includes a ship engaged in towing whales ;

“whaling” includes the taking and treatment of seals and walruses, and references to whales shall be construed accordingly.

3. No structure shall be deemed to be watertight, gastight or oiltight for the purposes of these regulations unless all openings in that structure, other than ventilation openings necessary for the admission of air from passageways to sanitary accommodation, laundries, drying rooms or galleys, are provided with means of closure which will enable such openings to be made watertight, gastight or oiltight, as the case may be.

Structure.

4.—(1) Every person to whose order a ship to which these regulations apply is being constructed shall cause a plan of the ship, on a scale not smaller than 1 in 100, to be submitted to a surveyor of ships on a day not later than the day on which the keel of the ship is laid, showing clearly the proposed arrangement of the crew accommodation in the ship and its proposed position in relation to other spaces therein.

Plans.

(2) Every such person shall cause the following plans to be submitted to a surveyor of ships on a day not later than the day on which the construction of any part of the crew accommodation is begun—

(a) plans of the proposed crew accommodation, on a scale not smaller than 1 in 50 in the case of a ship under 500 feet in length and not smaller than 1 in 100 in the case of any other ship, showing clearly the purpose for which each space therein is to be appropriated and the proposed disposition of the furnishings, fittings and obstructions therein ; and

(b) plans showing clearly the proposed arrangements for supplying water to the crew accommodation and for heating, lighting and ventilating the accommodation.

(3) The owner of every ship to which these regulations apply shall submit or cause to be submitted to a surveyor of ships before any alteration or reconstruction is carried out in the crew accommodation thereof plans on the scales and showing the information, referred to in paragraphs (1) and (2) of this regulation, and relating to the crew accommodation as altered or reconstructed, as the case may be: Provided that if the crew accommodation in any ship is altered or reconstructed at a place outside Nigeria in consequence of an emergency or an accident to the ship, such plans shall be submitted to a surveyor of ships as soon as may be.

Position  
of crew  
accommoda-  
tion.

5.—(1) In every ship to which these regulations apply the crew accommodation, other than store rooms, shall be wholly situated above the summer load line, if any, marked on the ship in accordance with section 201 of the Act. The Government Inspector of Shipping may exempt from the requirements of this paragraph—

- (a) any ship of under 200 tons;
- (b) any passenger ship;
- (c) any whale catcher;
- (d) any tug;
- (e) any cable ship;
- (f) any salvage ship;
- (g) any crane ship;
- (h) any dredger and any ship engaged in the conveyance of the spoil of dredging; and

(i) any other ship not being a ship engaged in the carriage of cargo, if he is satisfied that compliance therewith is unreasonable or impracticable by reason of the size or intended service of the ship.

(2) In every ship to which these regulations apply the crew accommodation other than store rooms, shall be situated amid-ships or aft. The Government Inspector of Shipping may exempt any ship from the requirements of this paragraph to the extent to which he is satisfied that compliance therewith is unreasonable or impracticable by reason of the size or intended service of the ship; provided that in ships of 500 tons or over no part of the crew accommodation, other than store rooms, shall be forward of the collision bulkhead.

(3) Sleeping rooms forming part of the crew accommodation of a passenger ship to which these regulations apply shall not be situated immediately beneath a working passageway.

Height of  
crew  
accommoda-  
tion.

6.—(1) In every ship to which these regulations apply the height of the crew accommodation measured from the top of the floor beams to the top of the crown beams shall not be less than the following—

In ships of under 1,600 tons .. .. . 7 feet; and

In ship of 1,600 tons or over .. .. . 7 feet 6 inches

The Government Inspector of Shipping may exempt from the requirements of this paragraph—

- (a) any ship, in respect of store rooms and sanitary accommodation; and
- (b) any sea-going ship which is for the greater part of her commission employed on inland waters, to the extent to which he is satisfied that compliance therewith is unreasonable or impracticable in the circumstances.



(2) Every sleeping room forming part of the crew accommodation in a ship to which these regulations apply shall be so constructed as to provide a clear headroom of at least 6 feet 3 inches at every point in the room which is available for free movement. The Government Inspector of Shipping may exempt any ship of under 500 tons from the requirements of this paragraph to the extent he is satisfied that compliance therewith is unreasonable or impracticable in the circumstances.

7.—(1) In every ship to which these regulations apply all bulkheads enclosing or within any part of the crew accommodation shall be properly constructed of steel or other suitable material. If the bulkheads are exposed to the weather they shall be of watertight and gastight construction, and means of closure shall be provided for all openings in such bulkheads so as to enable them to be made weathertight.

Construction of bulkheads and panelling.

(2) Any bulkhead which separates any part of the crew accommodation (other than a recreation deck space) from a space used as—

- (a) a permanent coal bunker;
- (b) an oil fuel bunker;
- (c) a cargo or machinery space;
- (d) a lamp room or paint room;
- (e) a store room not forming part of the crew accommodation (other than a dry provision store room);
- (f) a chain locker; or
- (g) a cofferdam

shall be gastight, and shall be watertight where necessary to protect the crew accommodation.

(3) Any bulkhead which separates any part of the crew accommodation from a dry provision store room (whether or not such store room forms part of the crew accommodation) shall be gastight.

(4) Subject to the provisions of paragraph (5) of regulation 28 of these regulations any bulkhead which separates any part of the crew accommodation from sanitary accommodation or from a laundry or drying room, galley or cold store room (whether or not such sanitary accommodation, laundry, drying room, galley or cold store room forms part of the crew accommodation) shall be gastight, and shall be watertight to such height as is necessary to prevent the passage of water into the adjoining space. In particular any bulkhead separating sanitary accommodation from any other part of the crew accommodation shall, except in a doorway, be watertight to a height of at least 9 inches above the floor of the sanitary accommodation. Provided that the requirements of this paragraph shall not apply to bulkheads separating—

- (a) sanitary accommodation from other sanitary accommodation;
- (b) a laundry or drying room from another laundry or drying room;
- (c) a galley from another galley or a pantry;
- (d) a cold store room from another cold store room; or
- (e) sanitary accommodation appropriated for the sole use of one person from a sleeping room which it may be directly entered.

(5) Any inside panelling in the crew accommodation shall be constructed of plywood or other suitable material with a surface which can be easily kept clean. Neither bulkheads nor inside panelling shall be constructed with tongued and grooved boarding or in a manner likely to harbour vermin.

Overhead  
deck.

8.—(1) In every ship to which these regulations apply, being a ship constructed of steel or other metal, every deck which forms the crown of any part of the crew accommodation (in this regulation referred to as the "overhead deck"), and is exposed to the weather, shall be constructed of steel or other metal. The Government Inspector of Shipping may exempt any ship from the requirements of this paragraph to the extent to which he is satisfied that it is necessary to do so by reason of the intended service of the ship.

(2) The upper side of every such deck shall be sheathed with wood or with a material which complies with the requirements specified in the Second Schedule to these regulations. Such sheathing shall be properly laid and, if it consists of wood, shall be properly caulked. The Government Inspector of Shipping may exempt any ship from the requirements of this paragraph to the extent to which he is satisfied that the undersides of the overhead decks are insulated with a material (other than wood) which complies with the requirements specified in the Third Schedule to these regulations, and which is so fitted as to avoid as far as possible absorption of water, condensation, transmission of noise and harbouring of dirt and vermin.

(3) Every wooden overhead deck shall be at least  $2\frac{1}{2}$  inches thick and every wooden sheathing shall be at least  $2\frac{1}{2}$  inches thick. The Government Inspector of Shipping may exempt any ship from either of the requirements of this paragraph to the extent that he is satisfied that compliance therewith is unreasonable or impracticable in the circumstances.

Flooring.

9.—(1) In every ship to which these regulations apply the decks which form the floors in the crew accommodation shall be properly constructed and shall have a surface which provides a good foothold and is capable of being easily kept clean. The floor covering shall be impervious to water and, if the deck is situated on top of an oil tank, impervious to oil.

(2) Wooden decks which form the floors in the crew accommodation shall be at least  $2\frac{1}{2}$  inches thick and shall be properly laid and caulked. The Government Inspector of Shipping may exempt any ship from the requirements of this paragraph to the extent to which he is satisfied that the compliance therewith is unreasonable or impracticable in the circumstances.

(3) The surface of metal decks which form the floors of the crew accommodation, not being floors in sanitary accommodation, galleys, store rooms or laundries, shall be covered with linoleum or wooden planking, or with a material which complies with the requirements specified in the Second Schedule to these regulations. The joinings of such material with the side walls shall be rounded in a manner which will avoid crevices. Such linoleum, planking or material shall be properly laid and shall provide a good foothold. The joinings of the floors with the side walls shall be rounded in a manner which will avoid crevices.

Protection  
from  
weather, etc.

10.—(1) In every ship to which these regulations apply the crew accommodation and the means of access thereto and egress therefrom shall be so arranged and constructed and situated in such a position as to ensure—

(a) the protection of the crew against injury to the greatest practicable extent ;

(b) the protection of the crew accommodation against the weather and the sea ;

(c) the insulation of the crew accommodation from heat and cold ;

(d) the protection of the crew accommodation against moisture due to condensation ;

(e) the exclusion from the crew accommodation of effluvia originating in other spaces in the ship ; and

(f) the exclusion from the crew accommodation, to the greatest practicable extent, of noise originating in other spaces in the ship.

(2) Without prejudice to the generality of the foregoing paragraph—

(a) Every opening from an open deck into the crew accommodation shall be protected against the weather and the sea.

(b) The crew accommodation shall be accessible at all times from the open deck.

(c) Access to sleeping rooms, mess rooms, recreation rooms and studies which form part of the crew accommodation shall be obtained from a passageway which shall be provided with a hinged door at any entrances to the open deck. The Government Inspector of Shipping may exempt any ship from the requirements of this sub-paragraph to the extent to which he is satisfied that compliance therewith is unreasonable or impracticable by reason of the size or intended service of the ship.

(d) Bow hawse pipes shall not be situated in the crew accommodation. The Government Inspector of Shipping may exempt any ship of under 400 tons from the requirements of this sub-paragraph.

(e) Steam supply and exhaust pipes for steering gear, winches and similar equipment shall not pass through the crew accommodation. Provided that, if in the case of any ship of 500 tons or over the Government Inspector of Shipping is satisfied that alternative arrangements are unreasonable or impracticable in the circumstances, he may permit such pipes, if properly encased, to pass through passageways forming part of the crew accommodation subject, in the case of supply pipes, to the following conditions—

(i) the pipes shall be constructed of solid drawn steel or other suitable material ;

(ii) the pipes shall be of a scantling sufficient to withstand the maximum pressure from the ship's boiler system ;

(iii) all connections in the pipes shall be by faced flanges properly jointed ; and

(iv) the pipes shall be fitted with adequate drainage arrangement. The Government Inspector of Shipping may exempt any ship of under 500 tons from the requirements of this sub-paragraph if he is satisfied that adequate arrangements have been made to ensure the safety of the crew.

(f) All steam pipes, hot water pipes and calorifiers in or serving the crew accommodation shall be efficiently lagged wherever lagging is necessary for the conservation of heat or the protection of the crew against injury or discomfort. All cold water pipes in the crew accommodation shall be efficiently lagged wherever lagging is necessary for the prevention of condensation.

(g) Chain pipes, and ventilator trunks to cargo spaces or tanks, shall be made of steel or other suitable material and shall be gastight where they pass through any part of the crew accommodation.

(h) Batteries for the operation of the ship's radio installation, if any, shall not be placed in any sleeping room provided for the crew, and precautions shall be taken which will ensure that fumes from such batteries cannot discharge into any part of the crew accommodation.

(i) The bulkheads and the parts of the ship's side which enclose the crew accommodation, shall be insulated in a manner which will prevent overheating of the accommodation, and shall be covered with protective covering which will prevent the condensation of moisture. The Government Inspector of Shipping may exempt any ship from the requirements of this sub-paragraph to the extent to which he is satisfied that the crew accommodation is adequately protected by its position and ventilation against overheating and condensation.

(j) Every bulkhead, casing and deck separating the crew accommodation from other spaces in the ship in which heat or cold may be generated shall be insulated in a manner which will prevent the crew accommodation being so affected by such heat or cold or by condensation as to prejudice the health or comfort of the crew.

(k) Every ship for the time being regularly engaged on voyages to, within or through the Tropics or the Persian Gulf shall be provided with awnings which will cover—

(i) all exposed decks and house-tops situated immediately above any part of the crew accommodation ;

(ii) all exposed sides of galleys situated on an open deck ;

(iii) such portions of the deck spaces provided for the recreation of the crew in compliance with paragraph (6) of Regulation 22 of these regulations as will provide a shaded area adequate in extent having regard to the number of persons in the crew and to any shade provided for such spaces by overhanging decks.

The awnings shall be supported by stanchions or by other suitable means.

(l) There shall be no direct opening between the crew accommodation (other than recreation deck spaces) and any space used as a store room for engine room stores or deck department stores. The Government Inspector of Shipping may exempt—

(i) any ship of under 500 tons ; and

(ii) any whale catcher from the requirements of this sub-paragraph to the extent to which he is satisfied that compliance therewith is impracticable in the circumstances.

(m) There shall be no direct opening between the crew accommodation (other than recreation deck spaces) and spaces used as—

(i) permanent coal bunkers ;

(ii) oil fuel bunkers ;

(iii) cargo or machinery spaces ;

(iv) lamp rooms or paint rooms ;

(v) store rooms not forming part of the crew accommodation (other than store rooms for engine room or deck department stores) ;

(vi) chain lockers ; or

(vii) cofferdams.

Provided that there may be a direct opening between machinery spaces and sanitary accommodation and changing rooms provided for the sole use of officers and ratings of the engine room department. The Government Inspector of Shipping may exempt any ship from the requirements of this sub-paragraph in so far as it relates to a direct opening between any passageway forming part of the crew accommodation and any of the aforesaid spaces. The Government Inspector of Shipping may further



exempt any whale catcher from such requirement in so far as it relates to a direct opening between any machinery space and any part of the crew accommodation.

(n) Subject to the provisions of paragraph (3) of regulation 24, paragraph (6) of regulation 28 and paragraph (16) of regulation 32 of these regulations there shall be no direct opening between the crew accommodation (other than recreation deck spaces or passageways) and any sanitary accommodation, laundry or drying room (whether or not such sanitary accommodation, laundry or drying room forms part of the crew accommodation). Provided that nothing in this sub-paragraph shall prohibit direct openings between spaces forming part of the sanitary accommodation, or between spaces appropriated for use as laundries or drying rooms.

(o) Any part of the crew accommodation which is adjacent to any part (other than the crown) of a tank in which oil may be carried in bulk, shall be separated therefrom by a gastight division additional to the division which retains the oil. The Government Inspector of Shipping may exempt any ship from the requirement of this sub-paragraph if he is satisfied that the division which retains the oil is likely to remain oiltight under service conditions.

(p) If any part of the crew accommodation is situated on a deck which forms the crown of a space in which oil may be carried in bulk, such deck shall be oiltight. No manholes or other openings to the oil tanks shall be situated in the crew accommodation. The Government Inspector of Shipping may exempt any ship used in treating whales or for the carriage of persons employed in catching or treating whales from the requirements of this sub-paragraph in so far as they relate to manholes or other openings in the oil tanks.

(q) If any part of the crew accommodation is situated on a deck forming the crown of a permanent coal bunker, such deck shall be gastight.

(r) The means of access to and egress from every part of the crew accommodation shall be so situated that in the event of fire in any lamp room or paint room in the ship, access to and egress from the crew accommodation will not be impeded.

11.—(1) In every ship to which these regulations apply, other than a ship employed solely within the Tropics or the Persian Gulf, all sleeping rooms, mess rooms, recreation rooms, sanitary accommodation, offices, studies and hospitals forming part of the crew accommodation shall be provided with a heating system which shall be permanently installed and capable of ensuring that when the ventilation system provided for such rooms or accommodation in compliance with these regulations is working so as to furnish at least 15 cubic feet of fresh air per minute for each person whom the room or accommodation is designed to accommodate at one time and the temperature of the open air is 30° F. the temperature therein can be maintained at 67° F. Provided that the temperature within a water closet shall not be required to be maintained at more than 10° F. above the ambient temperature in the open air. If the temperature within any water closet is capable of being so maintained by heat derived from an adjoining compartment, a heating system shall not be required to be provided in that water closet. The Government Inspector of Shipping may exempt from the requirements of this paragraph—

Heating.

(i) any ship of under 500 tons, and

(ii) any ship intended to be engaged solely on voyages in the Tropics or the Persian Gulf if he is satisfied that the crew accommodation is fitted with stoves which are properly installed and adequately guarded, or with other suitable means of heating.



(2) The permanent heating system required by the foregoing paragraph shall be operated by steam, hot water or electricity, or shall be a system supplying warm air.

(3) The heating equipment shall be so constructed, installed and, if necessary, shielded as to avoid the risk of fire and not to constitute a source of danger or discomfort to the crew. In particular, means shall be provided, unless the provision thereof is unreasonable or impracticable in the circumstances, by which, without the use of a tool or key, the heat emitted by the radiator or other heating device fitted in any space can be turned off and on and varied. The heating equipment shall be so constructed that its operation is not affected by the use or non-use of any steering gear, deck machinery, calorifiers or cooking appliances in the ship.

(4) The heating system shall be in operation at all times when any members of the crew are living or working on board the ship and circumstances require its use. Provided that while the ship is in port the heating system shall not be required to be in operation if efficient temporary means of heating are provided for such parts of the crew accommodation as are in use.

#### Lighting.

12.—(1) In every ship to which these regulations apply every part of the crew accommodation, other than pantries, laundries, drying rooms, lockers and store rooms shall be properly lighted by natural light. Provided that if in any space in a passenger ship or in a ship engaged in the whaling industry it is impracticable to provide proper natural lighting, such lighting shall not be required if adequate electric lighting is always available in that space. The Government Inspector of Shipping may exempt any ship from the requirement of this paragraph in relation to sanitary accommodation and passageways to the extent to which he is satisfied that compliance therewith is unreasonable or impracticable in the circumstances.

(2) The natural lighting of a sleeping room, mess room, recreation room or hospital ward shall be deemed to be proper for the purposes of this regulation if it is sufficient to enable an ordinary newspaper to be read by a person of normal vision at any point in the room, being a point available for free movement, during day time and in clear weather.

(3) Every side scuttle in a sleeping room, mess room, smoking room or recreation room in the crew accommodation shall be capable of being opened. Provided that this paragraph shall not apply to a side scuttle which is required to be of the non-opening type by the provisions of the Merchant Shipping (Passenger Ship Construction) Rules.

(4) In every ship of 3,000 tons or over every such side scuttle shall be at least 12 inches in diameter. The Government Inspector of Shipping may exempt any ship from the requirement of this paragraph to the extent to which he is satisfied that compliance therewith is unreasonable or impracticable in the circumstances.

(5) In every ship to which these regulations apply an electrical system shall be installed which is capable of providing adequate lighting in every part of the crew accommodation. The electric lights shall be so arranged as to give the maximum benefit to the crew, and in particular an electric reading light shall be fitted at the head of each bed and shall be capable of being switched on and off from the bed. A lamp emitting at least 200 lumens shall be fitted in every such reading light in a sleeping room, and a lamp emitting at least 400 lumens shall be fitted in every such light in a hospital ward. An efficient alternative

system of lighting or source of electric power shall always be available for lighting the crew accommodation. The Government Inspector of Shipping may exempt any ship of under 500 tons from the requirement of this paragraph if he is satisfied that compliance therewith is unreasonable or impracticable in the circumstances and that other suitable artificial lighting is provided in the crew accommodation.

(6)—(a) In addition to any other lights required by these regulations the spaces referred to in sub-paragraphs (d) to (n) inclusive of this paragraph shall be provided with the lighting therein specified.

(b) The electric lighting of the spaces referred to in sub-paragraphs (d) to (n) inclusive of this paragraph shall be deemed to be adequate for the purposes of these Regulations if, when the lamps and paintwork are new, the illumination in the horizontal plane, when measured at the points and in the manner prescribed in sub-paragraph (c) of this paragraph is steady and subject to a tolerance of 10 per cent. is maintained at a value of not less than that prescribed for every such space.

(c) The points at which illumination shall be measured shall be as follows—

(i) Where general measurement points are prescribed for the illumination of a space, then measurements shall be taken at every point midway between every two adjacent lamps and at every point midway between every lamp and any position on any boundary of the space.

Provided always that where within any space a part of that space (being a part of that space available for free movement) is shaded from the direct rays of a lamp by a re-entrant angle formed in the boundary of the space, then the central point of the part of the space so shaded shall also be a general measurement point; and

(ii) Where particular measurement points are also prescribed for a space, then measurements shall in addition be taken at every such point.

In all cases measurements shall be taken at a height of 2 feet 9 inches above the floor, except that in the case of passageways, companionways, and covered recreation deck spaces, measurements may be taken either at a height of 2 feet 9 inches above the floor or at floor level, provided that in the latter case the reflection factor of the floor surface shall not be less than 40 per cent. Illumination of provision store rooms shall be measured when the rooms are empty.

(d) *Sleeping Rooms and Day Rooms—*

2 foot-candles immediately in front of any drawer, bookcase, clothes locker, wardrobe and toilet mirror.

5 foot-candles at any wash-basin.

6 foot-candles at any seat at a writing desk or table, and at not less than half the remaining seats in a sleeping room provided for the use of more than one person.

For the purposes of this sub-paragraph reading lights at the heads of beds shall not be taken into account in determining the illumination of a space except in the case of a sleeping room provided for the use of one person only.

(e) *Mess Rooms—*

2 foot-candles at general measuring points.

5 foot-candles at any table and sink.

(f) *Recreation and Smoking Rooms—*

2 foot-candles at general measuring points.

5 foot-candles at the recreation tables.

6 foot-candles at any seat at a writing position at a desk or table and at not less than half the remaining seats.

(g) *Hospital Wards*—

2 foot-candles at general measuring points.

5 foot-candles at any wash-basin.

In addition to the electric reading lamp required to be provided at the head of each bed in accordance with paragraph (5) of this regulation, at least one fixed lamp shall be installed. The portable electric lamp required to be provided by paragraph (10) of regulation 32 of these regulations shall emit at least 600 lumens.

For the purposes of this sub-paragraph reading lights at the head of beds shall not be taken into account in determining illumination except in the case of a hospital ward provided for the use of one person only.

(h) *Offices and Studies*—

2 foot-candles immediately in front of any drawer and any bookcase.

8 foot-candles at every writing position at a desk or table.

(i) *Sanitary Accommodation* (including such accommodation in Hospitals)—

Water Closets—3 foot-candles in way of the pan.

Wash Rooms and Bathrooms—3 foot-candles at all general measurement points.

5 foot-candles at any wash-basin or washing trough and at or near the head of any bath.

(j) *Laundries*—

3 foot-candles at general measuring points.

5 foot-candles at any washing trough.

(k) *Drying Rooms*—

2 foot-candles in the centre of the space.

(l) *Galleys (including Bakeries and Pantries)*—

6 foot-candles at working positions.

The lamps shall be so disposed as to ensure that the food preparation tables, the range top, the serving tables and the washing up sinks receive the maximum amount of light.

(m) *Provision Store Rooms*—*Dry Store Rooms*

2 foot-candles at general measurement points.

2 foot-candles immediately in front of shelving and any cupboard.

*Cold Store Rooms*

Half the standard prescribed for a Dry Store Room.

(n) *Passageways, Companionways and Covered Recreation Deck Spaces.*

2 foot-candles at general measurement points.

A lamp shall be placed at or near the head of each stairway or ladder or hatchway and at or near doors of any lockers provided for oilskins or working clothes.

## Ventilations.

13.—(1) In every ship to which these regulations apply the enclosed parts of the crew accommodation shall be ventilated by a system which will maintain the air therein in a state of purity adequate for the health and comfort of the crew. Such system shall be capable of being so controlled as to ensure a sufficiency of air movement under all conditions of weather and climate to which the ship is likely to be subjected during the voyages on which she is intended to be engaged, and shall be additional to any side scuttles, skylights, companions, doors or other apertures not intended solely for ventilation.

(2) (a) Every such enclosed space, being a space not ventilated by a trunked mechanical ventilation system, shall be provided with a natural system of inlet and exhaust ventilation. Every inlet ventilator forming part of such system, being a ventilator situated in the open air, shall be of a cowl or other equally efficient type and shall be so situated that, as far as is practicable, it is not screened from the wind in any direction. No such ventilator shall be situated directly over a doorway, stairway or exhaust opening.

(b) The sectional area of every part of the inlet and exhaust system (other than a part serving only a drying room or locker) shall be at least six square inches for each person for whose use at any one time the space is appropriated, and shall be not less than 19 square inches in all at any point in the system. The effective area of the inlet and exhaust system serving each space shall be capable of being adjusted from fully open down to a minimum of 3 square inches for each person likely to use the space at any one time.

(3) Every such enclosed space, other than a cold store room, forming part of the crew accommodation of a ship to which these regulations apply, of 500 tons or over, shall be provided with a trunked mechanical ventilation system complying with the requirements specified in the First Schedule to these regulations. Provided that such a system shall not be required in any galley, which is situated on an open deck and exposed to the weather on the fore end and the port and starboard sides. The Government Inspector of Shipping may exempt any ship from the requirement of this paragraph, in so far as it relates to the ventilation of a store room for the storage of dry provisions, if he is satisfied that compliance with that requirement is unnecessary by reason of the position of the store room.

(4) In the crew accommodation of every ship to which these regulations apply, being a ship not provided with trunked mechanical ventilation and not being a ship for the time being regularly engaged only on voyages north of 53° North latitude or south of 45° South latitude, an electric fan shall be fitted in every sleeping room, mess room, recreation room, study, office, galley and pantry. The Government Inspector of Shipping may exempt any ship of under 500 tons from the requirement of this paragraph.

(5) Power for the operation of the trunked mechanical ventilation system or fans, as the case may be, required by the foregoing paragraphs of this regulation shall be available at all times when any members of the crew are on board the ship and circumstances require such system or fans to be used.

(6) The following spare gear shall be provided for each size of electric motor employed to operate a trunked mechanical ventilation system in the crew accommodation of a ship to which these regulations apply—

For direct Current Motors—

- 1 Armature
- 1 Field coil
- 1 Set of bearings
- 1 Set of carbon brushes
- 1 Brush holder

For Alternating Current Motors—

- 1 Set of stator windings, complete with insulation pieces.
- 1 Set of bearings.

The spare gear shall be properly packed for storage.



## Drainage.

14.—(1) In every ship to which these regulations apply efficient drainage by pipes or channels shall be provided for every part of the crew accommodation situated on an open deck wherever such drainage is necessary for clearing water shipped from the sea.

(2) There shall be no drainage from any source (not being sanitary accommodation) into the sanitary accommodation forming part of the crew accommodation:

(3) Every space appropriated for use as sanitary accommodation shall be served by one or more scuppers which do not serve any space other than sanitary accommodation. The scuppers shall be at least 2 inches in diameter and shall be situated wherever water is likely to collect on the floor of the space. Provided that no scupper shall be required in washing accommodation appropriated for the sole use of one person.

Painting,  
etc.

15.—(1) In every ship to which these regulations apply the interior sides and ceilings of every part of the crew accommodation shall be covered with enamel, paint or other suitable material. The paint, enamel or other material shall be of good quality and white or light in colour.

(2) Lime wash or paint containing nitro-cellulose shall not be applied in the crew accommodation.

(3) The wooden parts of the furniture and fittings in the crew accommodation shall be finished externally with paint, varnish, polish or by other suitable means.

(4) All paint, varnish, polish and other finishes in the crew accommodation shall be capable of being easily kept clean and shall be maintained in good condition.

## Marking.

16.—(1) Every sleeping room forming part of the crew accommodation of a ship to which these regulations apply shall be marked inside the room with whichever of the markings specified in Part I of the Fourth Schedule to these regulations is appropriate in the circumstances.

(2) Every space, other than a sleeping room or an open deck, forming part of the crew accommodation of such a ship shall be marked either inside the space or on or over the door to such space with whichever of the markings specified in Part II of the Fourth Schedule to these regulations is appropriate in the circumstances.

(3) All markings required by the foregoing provisions of this regulation shall be in clear characters and in a readily visible position on the ship's structure. The markings shall be cut into the structure or otherwise marked in an equally permanent manner.

(4) No space forming part of the crew accommodation of a ship to which these regulations apply shall be marked, whether inside or outside the space, with any marking which may be taken to indicate that the space is appropriated for use by persons differing in number or description from the persons for whose use the space has been certified by a surveyor of ships.

Sleeping  
Rooms.

17.—(1) In every ship to which these regulations apply, unless the circumstances are such that no members of the crew are required to sleep on board, sleeping rooms shall be provided for the crew in accordance with the following provisions of this regulation. Separate and appropriate sleeping rooms shall be provided wherever required by the widely different national habits and customs of groups of persons in the crew.

(2) (a) Each of the following classes of persons shall be provided with sleeping rooms separated from those provided for the other classes :—



- (i) Officers.
- (ii) Petty Officers.
- (iii) Apprentices.
- (iv) Ratings of the deck department, other than petty officers.
- (v) Ratings of the engine room department, other than petty officers.
- (vi) Ratings of the catering department, other than petty officers.

(b) Every watch of ratings shall be provided with sleeping rooms separate from those of other watches. Day-men shall be provided with sleeping rooms separate from those of watch-keepers.

The Government Inspector of Shipping may exempt from the requirements of this paragraph—

- (i) any whale catcher; and
- (ii) any other ship to the extent that he is satisfied that compliance with the said requirement is unreasonable or impracticable by reason of the size of the ship.

The Government Inspector of Shipping may further exempt any ship engaged in the whaling industry from the requirements of sub-paragraph (b) of this paragraph.

(3) The maximum number of persons accommodated in sleeping rooms shall be as follows—

(a) Officers in charge of a department, navigating and engineer officers in charge of a watch, and First or only Radio Officers:—1 person per room.

(b) Other officers:—wherever practicable 1 person per room and in no event more than 2 persons per room.

(c) Apprentices:—wherever practicable not more than 3 persons per room, and in no event more than 4 persons per room.

(d) Chief or only steward and chief or only cook, in either case in a ship of 3,000 tons or over regularly employed otherwise than as a home trade ship:—1 person per room.

(e) Petty officers not being persons referred to in sub-paragraph (d):—wherever practicable 1 person per room, and in no event more than 2 persons per room.

(f) Other ratings:—wherever practicable 2 or 3 persons per room, and in no event more than 4 persons per room; provided that in any passenger ship the Government Inspector of Shipping may permit more than 4, but not more than 10, such ratings to be accommodated in one room if he is satisfied, after consultation with the owner of the ship or with such organisation or organisations as appear to him to be representative of the ratings concerned, that the comfort of these ratings will thereby be increased.

The Government Inspector of Shipping may exempt any ship used in treating whales or for the carriage of persons employed in catching or treating whales, from the requirements of this paragraph in so far as they relate to sleeping accommodation for persons not engaged to work the ship. The Government Inspector of Shipping may exempt also any whale catcher from the requirements of sub-paragraph (a) of this paragraph and any ship of under 400 tons from the requirements of sub-paragraphs (a) and (d) of this paragraph.

(4) Subject to the provisions of sub-paragraphs (b) and (c) of this paragraph, the minimum floor area provided for each person in a sleeping room forming part of the crew accommodation of a ship to which these regulations apply shall be as follows—

	<i>Square Feet</i>
(a) In ships of under 400 tons .. .. .	15
In ships of 400 tons or over but under 800 tons ..	20
In ships of 800 tons or over but under 3,000 tons ..	25
In ships of 3,000 tons or over .. .. .	30

(b) Subject to the provisions of sub-paragraph (c) of this paragraph the minimum floor area provided in a sleeping room in a passenger ship shall be 24 square feet per person if more than 4 ratings are accommodated in that room.

(c) Subject to the provisions of this sub-paragraph the minimum floor area provided for each person in a sleeping room for such ratings as are referred to in paragraph (2) of regulation 39 of these regulations (in this sub-paragraph referred to as "special ratings") shall be as follows—

	<i>Square Feet</i>
In ships of under 400 tons .. .. .	14
In ships of 400 tons or over but under 3,000 tons ..	18
In ships of 3,000 tons or over .. .. .	20

The total floor area of the sleeping rooms provided in the ship for special ratings shall not be less than would be required by sub-paragraph (a) of this paragraph to be provided for such number of ratings as would be necessary in substitution for the special ratings if the special ratings were replaced by other ratings.

(d) In determining the floor area of a room for the purpose of this paragraph spaces occupied by berths, lockers, seats or chests of drawers shall be taken into account and spaces which by reason of their small size or irregular shape cannot accommodate furniture and do not contribute to the area available for free movement shall not be taken into account.

18. (1) Every sleeping room in the crew accommodation of a ship to which these regulations apply shall be fitted with a bed for each person accommodated in the room.

Bed.

(2) The framework of each bed, and the lee-boards or lee-rails thereof, if any, shall be constructed of metal or other material which is hard smooth and unlikely to become corroded. The framework shall be so made as not to be likely to harbour vermin. In particular, if the bed is constructed with tubular frames, the frames shall be completely sealed and without perforations.

(3) There shall be unobstructed access to at least one side of each bed and, in particular, if the adjacent sides of two beds in the same room are parallel to each other or, when projected, make an angle of less than 90° with each other, the distance between those sides at any point shall not be less than 2 feet 6 inches if both beds are in single tier or 3 feet in any other case.

(4) Where beds abutt upon each other they shall be separated by screens made of wood or other suitable material.

(5) No bed shall be placed—

(a) within 4 inches of a ventilation trunk which may be used for circulating hot air, or

(b) within 2 inches of a bulkhead or the ship's side, unless the bed is so supported and the room so constructed as to avoid harbouring dirt and vermin in or near the bed, to enable the bedding to be kept clean and dry, and to minimise the soiling of paint work in way of the bed.

(6) Beds shall not be arranged in tiers of more than two.

(7) Beds placed along the ship's side shall be in single tier, except in a room in which there is no side scuttle. The Government Inspector of Shipping may exempt any ship from the requirement of this paragraph to the extent to which he is satisfied that the beds in the sleeping room are clear of side scuttles, and that the comfort of the crew will thereby be increased.

(8) No bed shall—

(a) be less than 1 foot from the floor of the room measured from the bottom of the mattress referred to in paragraph (10) of this regulation; and

(b) if the upper bed in a double tier, be at least 2 feet 6 inches below the lower side of the deck head beams or other obstructions measured from the bottom of the mattress. The bottom of the mattress in the lower bed shall be at least 3 feet below the bottom of the mattress in the upper bed if the height of the sleeping room is 7 feet 6 inches or more, and at least 2 feet 9 inches below the bottom of the mattress in the upper bed if the height of the sleeping room is less than 7 feet 6 inches. For the purposes of this sub-paragraph the height of the room shall be measured from the top of the floor beams to the top of the crown beams.

The Government Inspector of Shipping may exempt—

(i) any ship of under 500 tons from any of the requirements of this paragraph; and

(ii) any ship from the requirements of sub-paragraph (b) of this paragraph to the extent to which he is satisfied that it is unreasonable or impracticable in the circumstances to remove obstructions above the beds in the crew accommodation of that ship.

(9) The size of the beds provided for the crew shall—

(a) subject to the provisions of sub-paragraph (b) of this paragraph, be at least 6 feet 3 inches by 2 feet 3 inches, the measurements being taken inside the lee-boards or lee-rails, if any, and at right angles to each other;

(b) in a ship of 3,000 tons or over for the Chief Officer and for the Chief and Second Engineers, be at least 6 feet 3 inches by 2 feet 9 inches in a passenger ship and at least 6 feet 3 inches by 3 feet 6 inches in any other ship, the measurements in each case being taken as aforesaid.

(10) Every bed provided for a member of the crew shall be fitted with a spring bottom or spring under-mattress, and with a mattress made of material which will resist damp and is unlikely to harbour vermin. A bottom of wood, canvas or other dust-proof material shall be fitted to every bed which is fitted above another bed.

19.—(1) In every ship to which these regulations apply every sleeping room for ratings other than petty officers shall be provided with the following equipment—

(a) For each person accommodated in the room—

(i) one drawer having a capacity of at least 2 cubic feet; and

Furniture  
and fittings  
in sleeping  
rooms.

(ii) one clothes locker or wardrobe, in either case at least 5 feet 6 inches in height and 315 square inches in internal sectional area; the locker or wardrobe shall be fitted with a shelf not less than 9 inches and not more than 15 inches below its top and with fittings on which clothes may be hung;

(iii) at least one coat hook in addition to any coat hooks fitted in a locker or wardrobe;

(b) A table of fixed or drop-leaf type, or a desk, or a sliding leaf or top fitted to a chest of drawers;

(c) Comfortable seats sufficient to accommodate at one time all the persons accommodated in the room. Such seats shall be provided in addition to the beds in the room. The Government Inspector of Shipping may exempt any passenger ship or ship engaged in the whaling industry from the requirements of this sub-paragraph to the extent to which he is satisfied that a lesser number of seats is adequate in the circumstances;

(d) A mirror suitable for toilet purposes;

(e) A cabinet suitable for containing toilet-requisites;

(f) A book rack;

(g) A runner of jute, coir or other suitable material at one side of each bed or tier of beds, as the case may be;

(h) A curtain fitted to each bed, unless the room accommodates only one person; and

(i) A curtain fitted to each side scuttle, unless the side scuttle is fitted with blinds or jalousies.

The Government Inspector of Shipping may exempt any whale catcher from any of the requirements of sub-paragraphs (g), (h) and (i) of this paragraph.

(2) Paragraph (1) of this regulation shall apply to sleeping rooms for petty officers as it applies to sleeping rooms for other ratings, subject to the following modifications and additions:—

(a) For each person accommodated in the room a second drawer having a capacity of at least 2 cubic feet shall be provided in addition to the drawer referred to in sub-paragraph (a) of paragraph (1) of this regulation.

(b) The clothes lockers or wardrobes provided shall be made of hardwood.

(c) Each room shall be provided with—

(i) a rack for holding one drinking-water bottle and one tumbler for each person accommodated in the room. The rack may be fitted inside the cabinet for toilet-requisites. Provided that a rack for holding a drinking-water bottle shall not be required in any room in which a supply of drinking-water is laid on;

(ii) a wash basin, of vitreous china or other equally hygienic and durable material, which shall be fitted with an efficient and hygienic discharge overside or to an enclosed tank with a suction pipe served by a mechanically operated pump; provided that a wash-basin shall not be required to be fitted in a sleeping room for petty officers if washing accommodation is readily accessible from the sleeping room.

(3) In every sleeping room in which more than one petty officer or other rating is accommodated, every drawer, locker and wardrobe shall be fitted with a secure lock or hasp for a padlock. In every sleeping room in which only one petty officer or other rating is accommodated the locker or wardrobe shall be fitted with such a lock or hasp.



(4) Subject to the provisions of paragraph 5 of this regulation every sleeping room for officers shall be provided with the following equipment :—

(a) For each officer accommodated in the room—

(i) at least three drawers with a total capacity of 10 cubic feet or as near thereto as is practicable in the circumstances ;

(ii) a wardrobe at least 5 feet 6 inches in height and 460 square inches in internal sectional area ;

(iii) at least two coat hooks, in addition to any coat hooks fitted in the wardrobe ;

(b) A writing desk fitted, if practicable, with drawers additional to the aforesaid drawers ;

(c) A chair with arm rests ;

(d) A settee at least 6 feet in length or as near thereto as is practicable in the circumstances ; provided that the Government Inspector of Shipping may permit the settee to be dispensed with—

(i) if he is satisfied that a settee of adequate dimensions cannot be placed in the room without interfering with the comfort of the officers ;  
or

(ii) in the case of a room which only accommodates one officer, if the Government Inspector of Shipping has consulted with such organisation as appears to him to be representative of the class of officer concerned and is satisfied that a fully upholstered easy chair with closed arms is provided in the room.

(e) A mirror suitable for toilet purpose ;

(f) A cabinet suitable for containing toilet requisites ;

(g) A rack suitable for holding—

(i) one drinking-water bottle, and

(ii) one tumbler for each officer accommodated in the room. The rack may be fitted inside the cabinet for toilet requisites. Provided that a rack for holding a drinking-water bottle shall not be required in any room in which a supply of drinking-water is laid on.

(h) A wash-basin of vitreous china or other equally hygienic and durable material, which shall be fitted with an efficient and hygienic discharge overside or to an enclosed tank with a suction pipe served by a mechanically operated pump. Provided that a wash-basin shall not be required to be fitted in a sleeping room if washing accommodation is readily accessible therefrom.

(i) A splash plate or other means of protection for the wall above the wash-basin, if any ;

(j) A carpet runner of wool or similar material ;

(k) Curtains fitted to each bed, unless the room accommodates only one officer ;

(l) Curtains fitted to each side scuttle, unless the side scuttle is fitted with blinds or jalousies ;

(m) A book case in any room which accommodates a Chief Officer, Chief Engineer or Second Engineer, or in the case of a passenger ship a First Radio Officer ; and

(n) A book case or book rack in rooms which accommodate other Officers.



The Government Inspector of Shipping may exempt any ship of under 400 tons from any of the requirements of sub-paragraphs (a), (b) and sub-paragraphs (k) to (n) inclusive, of this paragraph to the extent to which he is satisfied that compliance therewith is unreasonable or impracticable in the circumstances.

(5) Any of the equipment referred to in sub-paragraphs (b), (c), (d), (m) and (n) of paragraph (4) of this regulation may be provided in a day room available for the sole use of the officers concerned, instead of their sleeping room. Any of the equipment referred to in sub-paragraphs (e) to (i) inclusive of the said paragraph may be provided in washing accommodation approved for the exclusive use of one officer instead of in the sleeping room of that officer.

(6) Sleeping rooms for apprentices shall so far as is reasonable and practicable in the circumstances be provided with the equipment (other than a book case) referred to in paragraph (4) of this regulation. Provided that any of the equipment referred to in sub-paragraphs (b), (c), and (d) of the said paragraph may be provided in a study for the sole use of the apprentices instead of in their sleeping rooms.

(7) Subject to the foregoing provisions of this regulation, all lockers, wardrobes, tables, desks, the un-upholstered parts of chairs and settees and similar furnishings provided in compliance with this regulation shall be made of polished hardwood, rustproof metal or other smooth and impervious material not likely to crack, warp or become corroded. All furniture provided in sleeping rooms shall be so made as not to be likely to harbour vermin.

20.—(1) In every ship to which these regulations apply, unless the circumstances are such that no members of the crew are required to mess on board, mess rooms shall be provided for the crew and shall be of such dimensions as will be sufficient to accommodate the greatest number of persons likely to use them at any one time. Separate and appropriate mess rooms shall be provided wherever required by the widely different national habits and customs of groups of persons in the crew.

(2) No mess room shall be combined with a sleeping room. The Government Inspector of Shipping may exempt any ship of under 300 tons from the provision of this paragraph if he is satisfied that compliance therewith is unreasonable or impracticable in the circumstances.

(3) In every ship of 500 tons or over the mess rooms provided for ratings shall be separate from those provided for the Master of the ship or for officers.

(4) In every ship of 1,000 tons or over a single mess room shall be provided for all officers in the ship. Provided that the officers may be accommodated in separate mess rooms if their sleeping rooms are in widely separated portions of the ship.

(5) In every ship of 1,000 tons or over each of the following classes of ratings shall be provided with mess rooms separate from those provided for the other classes:—

- (a) petty officers of the deck department;
- (b) petty officers of the engine room department;
- (c) other ratings of the deck department;
- (d) other ratings of the engine room department.

Subject to the provisions of paragraph (1) of this regulation the Government Inspector of Shipping may permit the provision in any ship of combined mess rooms as follows:—

- (i) for petty officers of the deck and engine room departments;
- (ii) for petty officers and other ratings of the same department;
- (iii) for all ratings (other than petty officers) of the deck and engine room departments.

Subject as aforesaid the Government Inspector of Shipping may further permit the provision in any ship of a single mess room for all petty officers and other ratings of all departments, if he is satisfied that such an arrangement is preferred either by the owner of the ship or by an organisation which appears to the Government Inspector of Shipping to be representative of owners of Nigerian ships, and by an organisation which appears to him to be representative of the seamen concerned.

(6) In every ship of 3,000 tons or over, being either—

- (a) a ship other than a home trade ship, or
  - (b) a home trade ship with a catering department of more than 5 persons,
- mess rooms shall be provided for ratings of the catering department which shall be separate from those provided for ratings of other departments, unless the Government Inspector permits a combined mess room for petty officers and other ratings of all departments in accordance with the provisions of paragraph (5) of this regulation.

If in any other ship, a separate mess room is not provided for ratings of the catering department, messing accommodation shall be provided for them in mess rooms provided for other ratings.

(7) Apprentices shall be provided with a separate mess room or with messing accommodation in the officers' mess room.

(8) The Government Inspector of Shipping may exempt—

- (a) any passenger ship; and
- (b) any ship engaged in the whaling industry

from the requirements of this regulation to the extent to which is satisfied that compliance therewith is unreasonable or impracticable in the circumstances.

21.—(1) Every mess room forming part of the crew accommodation in a ship to which these regulations apply shall be provided with sufficient tables to allow a space of at least 20 inches measured along the edge of a table for each person likely to use the room at any one time. Each table shall be at least 24 inches wide if seats are provided on both sides of the table, and at least 15 inches wide if seats are provided only on one side of the table. The table shall be of such a size and so situated as to be readily accessible.

Furniture  
and fittings  
in Mess  
Rooms.

(2) Single chairs shall be provided in the mess room for each person using the room at any one time. Such chairs shall be fitted with arm rests unless chairs with arm rests are available in a recreation room for the persons using the mess room. Provided that settees may be substituted for chairs adjacent to a bulkhead or the ship's side. Such settees shall be at least 15 inches wide and shall be fitted with upholstered or padded seats covered with material impervious to dirt and moisture, and shall be provided with comfortably shaped backs. If the mess room is appropriated for use by officers or petty officers, whether or not together with other ratings, the backs of the settees shall also be padded or upholstered and shall be covered with material impervious to dirt and moisture.

(3) Every mess room provided for persons who do not provide their own food shall be fitted with either—

(a) a storage locker or rack in either case capable of holding sufficient mess utensils for those persons, or

(b) a storage locker at least 15 inches by 15 inches by 12 inches in size for each of those persons.

Every mess room provided for persons who provide their own food shall be fitted with a storage locker for each person which shall be of sufficient size to be capable of containing his mess utensils together with a supply of food sufficient for him for at least 7 days. All storage lockers provided in compliance with this paragraph shall be adequately ventilated, and all storage lockers provided for one person shall be fitted with a lock or hasp for a padlock, and shall be so fixed as to clear the floor by at least 1 foot.

Provided that the lockers or racks may be fitted in a pantry, store room or other suitable place outside a mess room, and readily accessible therefrom. No lockers or racks, being lockers or racks intended to contain food, shall be fitted in a sleeping room, not being a sleeping room combined with a mess room.

(4) A dresser, hot-press, sink and boiler or other means from which boiling drinking water shall always be available shall be fitted in each mess room, unless such equipment is fitted in a pantry readily accessible from the mess room or, in the case of a ship of under 1,000 tons, in a galley. Such equipment shall be adequate in size for the number of persons likely to use the room at any one time. If in the case of a mess room provided for officers or petty officers the dresser is fitted in a pantry a sideboard shall be provided in the mess room. A supply of fresh water shall be laid on to the sink and boiler. The Government Inspector of Shipping may exempt—

(a) any ship of under 1,000 tons from the requirement of a hot-press ;

(b) any ship of under 500 tons from any of the requirements of this paragraph.

(5) All tables, lockers, dressers and the un-upholstered parts of chairs and settees in the mess room shall be made of polished hardwood, rustproof metal or other smooth and impervious material not likely to crack, warp or become corroded. All furniture provided in the mess room shall be so made as not to be likely to harbour vermin.

(6) The Government Inspector of Shipping may exempt—

(a) any passenger ship ;

(b) any ship engaged in the whaling industry

from the requirements of this regulation to the extent to which is satisfied that compliance therewith is unreasonable or impracticable in the circumstances.

22.—(1) In every ship to which these regulations apply, being a ship of 3,000 tons or over employed otherwise than as a home trade ship, a smoking room shall be provided for the recreation of the officers, and shall not be combined with a mess room. The smoking room shall be provided with tables each having a top approximately 4 square feet in area and with tub chairs or easy chairs sufficient to accommodate at one time at least one-third of the number of officers for whose use the room is provided, and a bookcase.

(2) In every ship to which these regulations apply, being a home trade ship of 300 tons or over, or a ship of under 3,000 tons regularly employed otherwise than as a home trade ship, the mess room provided for the officers shall be available and furnished for use as a smoking room, unless a separate smoking room is provided for their use.

(3) In every ship to which these regulations apply recreation accommodation shall be provided in a mess room or elsewhere for ratings and shall be conveniently situated and appropriately furnished. Where such accommodation is provided elsewhere than in a mess room the seating provided shall be sufficient to accommodate at one time at least one-third of the number of ratings for whom that accommodation is provided. The Government Inspector of Shipping may exempt any whale catcher from the requirements of this paragraph.

(4) If more than two apprentices are accommodated in one sleeping room in a ship to which these regulations apply, a separate room shall be provided in the ship for their use as a study, unless another suitable place is available to them for purposes of study.

(5) In every ship to which these regulations apply, being a ship of 500 tons or over, a bookcase shall be provided for, and shall be accessible to, all members of the crew. The Government Inspector of Shipping may exempt any whale catcher from the requirements of this paragraph.

(6) In every ship to which these regulations apply space shall be provided on an open deck for the use of the crew for recreational purposes. The space shall be adequate in area (in so far as the size of the ship allows) having regard to the number of persons in the crew.

(7) Separate and appropriate recreation rooms shall be provided wherever required by the widely different national habits and customs of groups or persons in the crew.

23. In every ship to which these regulations apply, being a ship of 3,000 tons or over, and not being a ship used in treating whales or engaged in the carriage of persons employed in catching or treating whales, two separate rooms shall be provided for use as offices and shall be appropriately furnished for that purpose. One of such rooms shall be appropriated for use by the Chief Officer or the officers of the deck department, and the other for use by the Chief Engineer or for the officers of the engine room department. The office accommodation shall be in a room not used for any other purpose except study. Provided that an office appropriated solely for use by an individual officer may be combined with the day room of that officer.

Office  
Accom-  
modation.

24.—(1) In every class of ship to which these regulations apply each of the following classes of persons shall be provided with washing accommodation separate from that provided for the other classes—

Washing  
Accom-  
modation.

- (a) officers and apprentices ;
- (b) petty officers ;
- (c) ratings other than petty officers

Provided that the Government Inspector of Shipping may, in relation to any ship, permit any combination of the foregoing classes to be treated as one class for the purposes of these regulations, if he is satisfied that the circumstances so require.

(2) The washing accommodation shall be situated close to the sleeping accommodation of the persons for whose use it is appropriated. Provided that part of the washing accommodation for ratings of the engine room



department, may be adjacent to the engine room and stokehold. The Government Inspector of Shipping may exempt any whale catcher from the requirements of this paragraph.

(3) Access to washing accommodation shall not be directly obtained from a mess room or a sleeping room and shall wherever reasonable and practicable in the circumstances be obtained from a passageway. Provided that access to washing accommodation may be obtained directly from not more than 2 sleeping rooms accommodating not more than 4 persons in all, if the washing accommodation is appropriated for use solely by the person or persons accommodated in those sleeping rooms.

(4) The following equipment shall be provided in the washing accommodation for each class of persons referred to in paragraph (1) of this regulation—

- one bath or shower for every 8 persons ;
- one wash-basin for every 6 persons ; and
- one mirror suitable for toilet purposes for every 6 persons,

and each of such classes shall be provided with at least one bath or shower and at least one wash-basin. One additional bath or shower shall be provided for any of such classes in which the total number of persons exceeds by 4 or more a multiple of 8, and one additional wash-basin shall be provided for any of such classes in which the number of persons exceeds by 3 or more a multiple of 6.

For the purposes of this paragraph—

- (a) a bath and shower combined shall be deemed to be only a bath
- (b) no account shall be taken, in determining the number of baths and showers required, of—
  - (i) any private bath or shower ; or
  - (ii) the persons for whose use a private bath or shower is appropriated ;
- (c) no account shall be taken, in determining the number of wash-basins required, of—
  - (i) any private wash-basin ; or
  - (ii) the persons for whose use a private wash-basin is appropriated ;
- (d) a bath, shower or wash-basin shall be deemed to be private if it is appropriated for the exclusive use of not more than four persons.

The Government Inspector of Shipping may exempt from any of the requirements of this paragraph—

- (i) any ship in which the crew number more than 100 ;
- (ii) any passenger ship engaged solely on voyages which are normally of less than 4 hours duration.

(5) The wash-basins shall be made of vitreous china or other material having a smooth and impervious surface not likely to crack, flake or become corroded. Every wash-basin provided in a passenger ship, being a basin fitted with hot and cold fresh-water taps, shall have a capacity of at least 1 gallon. Every other wash-basin provided in compliance with these regulations shall have a capacity of at least  $1\frac{1}{2}$  gallons. The capacity of wash-basins shall be measured for the purposes of this paragraph to a level at least  $1\frac{1}{2}$  inches below the rim of the bowl.

(6) Every bath shall be at least 4 feet 5 inches in internal length unless it is combined with a shower. Every bath shall be made of vitreous enamelled iron, or other material having a smooth and impervious surface not likely to crack, flake or become corroded. The floor area of every shower space shall be at least  $6\frac{1}{2}$  square feet, and each side of the space shall be at least 2 feet 6 inches long.



(7) Baths and showers provided for any class of persons shall be situated in or adjacent to a room containing wash-basins and provided for that class of person. Screening shall be provided to ensure privacy for any bath or shower which is in the same room as any wash-basin and any other bath or shower, unless the room is appropriated for the sole use of one person. The screening shall be made of robust and opaque material, and shall be rigid on at least three sides of every bath and shower space. The screening shall, wherever reasonable and practicable in the circumstances, enclose sufficient space to permit a person to dress and undress in comfort therein.

(8) Every wash-basin, bath and shower shall be fitted with an efficient and hygienic discharge system and, in particular, the waste pipes shall be fitted in a manner which will minimise the risk of obstruction and facilitate cleaning. Every shower space shall be fitted with a handrail, a kerb and individual drainage. Every bath and shower space shall be provided with a grating or mat.

(9) Spring-loaded draw-off taps for hot and cold fresh water shall be fitted on a bulkhead or partition in every wash room provided for ratings, unless taps for hot and cold fresh water are fitted to each wash-basin in that room. Draw-off taps for cold salt water shall be fitted in every such wash room unless there are other adequate means of washing down the room. The Government Inspector of Shipping may exempt—

(a) any ship of under 500 tons ; and

(b) any whale catcher

from the requirements of this paragraph relating to hot water taps to the extent to which he is satisfied that compliance therewith is unreasonable or impracticable in the circumstances.

(10) Nothing in this regulation shall apply to the washing accommodation forming part of a permanent hospital, and for the purposes of paragraph (4) thereof no account shall be taken of any wash-basin, bath or shower fitted in a permanent hospital.

25.—(1) In every ship to which these regulations apply there shall be available a supply of fresh water sufficient for the wash-basins, baths and showers fitted in compliance with these regulations. The supply shall be provided from tanks of a capacity of at least 10 gallons for each member of the crew for each day likely to elapse between successive replenishments of the water or by other equally efficient means. If service tanks are fitted for that purpose they shall be directly connected with the ship's main washing water or drinking water storage tanks. In ships of 1,000 tons or over any pumping necessary for the supply of fresh water shall be by mechanical power.

Supply of  
water to  
Washing  
Accommo-  
dation.

(2) Hot and cold water shall be laid on to all wash-basins, baths and showers fitted in compliance with these regulations. Provided that—

(a) in the case of a bath and shower combined, hot and cold fresh water shall be required to be laid on only to the bath or the shower ; and

(b) hot and cold fresh water shall not be required to be laid on to wash-basins provided for the sole use of ratings if it is laid on to spring-loaded draw-off taps in the same room in accordance with paragraph (9) of regulation 24 of these regulations.

Cold fresh water shall be laid on to any wash-basins which are additional to those required by these regulations and are fitted in sleeping rooms.

(3) The hot fresh water shall be at a constant temperature of at least 150° F. and shall be supplied by thermostatically controlled calorifiers or by other equally safe and efficient means. Every shower bath shall be provided with an anti-scalding mixture valve which shall be adjusted so that the temperature of the shower-water (whether salt or fresh) can be varied by the person using a shower over the range of temperatures between the ambient temperature and a temperature of between 95° F. and 105° F.

(4) The Government inspector of Shipping may exempt—

(a) any ship of under 500 tons; and

(b) any whale catcher

from the requirement of this regulation relating to the supply of hot water to the extent to which he is satisfied that compliance therewith is unreasonable or impracticable in the circumstances.

Supply of  
Drinking  
Water.

26.—(1) In every ship to which these regulations apply a supply of drinking water shall be provided in the crew accommodation from tanks of an adequate capacity for the purpose having regard to the number of persons in the crew and the time likely to elapse between successive replenishment of the water, or by other equally efficient means. If service tanks are fitted for that purpose they shall be directly connected to the ship's main drinking water storage tanks. In ships of 3,000 tons or over any pumping necessary for the supply of drinking water in crew accommodation shall be by mechanical power.

(2) Cold drinking water shall be laid on to taps in the galleys and pantries, and in the mess rooms provided for those members of the crew for whose use service pantries are not provided.

(3) In every ship to which these regulations apply, being a ship of 1,000 tons or over employed otherwise than as a home trade ship, means shall be provided whereby the crew shall obtain access to drinking water which has been cooled by passing it through a cooling-tank or by other suitable means.

Laundry  
Facilities, etc.

27.—(1) In every ship to which these regulations apply, being a ship of 500 tons or over, washing troughs or other suitable facilities shall be provided to enable the crew to wash their clothes, and shall be adequate in size and sufficient in number for that purpose. Such troughs shall be made of or coated with hygienic and durable material having a smooth and impervious surface not likely to crack, flake or become corroded. The troughs or other facilities shall be situated in a room appropriated for use only as a laundry. Provided that the troughs or other facilities may be situated in the crew's washing accommodation if the provision of a separate laundry is unreasonable or impracticable in the circumstances. The troughs or other facilities shall be provided with an adequate supply of hot and cold fresh water, and shall be so arranged as to discharge overboard or into an enclosed tank served by a mechanically operated suction pump. The Government Inspector of Shipping may exempt any whale catcher from the requirements of this paragraph if he is satisfied that the wash-basins provided therein in compliance with regulation 24 of these regulations are suitable for washing clothes.

(2) In every ship to which these regulations apply, rooms for drying the crew's clothes shall be provided and shall be separate from sleeping rooms, mess rooms, recreation rooms, offices, store rooms, galleys, pantries and hospitals and shall be fitted with racks or rods with sufficient space having regard to the number of persons in the crew and the duration of the voyages on which the ship is intended to be engaged. The heating of such rooms shall

be capable of being controlled independently of the heating of any other space in the ship. The exhaust ventilation of such rooms shall be independent of all other spaces in the ship unless it is provided by a trunked mechanical ventilation system. Provided that in ships of under 500 tons drying cabinets or other suitable facilities may be substituted for a drying room.

(3) In every ship to which these regulations apply adequately ventilated compartments or lockers shall be provided for hanging oilskins and working clothes used by the crew. Separate compartments or lockers shall be provided for officers and ratings. The compartments or lockers shall be situated outside the sleeping rooms of the crew and in a position readily accessible therefrom. The Government Inspector of Shipping may exempt any ship of under 500 tons from any of the requirements of this paragraph.

28.—(1) In every ship to which these regulations apply each of the following classes of persons shall be provided with water closets separate from those provided for the other classes—

Water  
Closets.

- (a) officers and apprentices;
- (b) petty officers;
- (c) ratings other than petty officers.

Provided that the Government Inspector of Shipping may, in relation to any ship, permit any combination of the foregoing classes to be treated as one class for the purposes of this regulation if he is satisfied that the circumstances so require.

(2) Water closets shall be provided as follows—

(a) One for every 8 persons in each of the classes as aforesaid and each of such classes shall be provided with at least one water closet. One additional water closet shall be provided for any of such classes in which the total number of persons exceeds by 4 or more a multiple of 8.

Provided that—

(i) in determining the number of water closets required by this sub-paragraph no account shall be taken of—

- (a) any private water closet; or
- (b) the persons for whose use a private water closet is appropriated;

(ii) if the number of persons in any class exceeds 100, the number of water closets provided for that class shall be the greater of the following—

- (a) 13, or
- (b) 10, together with 4 per cent of the number of persons in excess of 100, calculated to the next following whole number.

For the purpose of this sub-paragraph a water closet shall be deemed to be private if it is appropriated for the sole use of not more than 4 persons. The Government Inspector of Shipping may exempt from the requirements of this sub-paragraph any passenger ship engaged solely in voyages the normal duration of which does not exceed 4 hours.

(b) In addition to the water closets required by sub-paragraph (a), there shall be provided such number of water closets, if any, as is required to increase the total number of water closets provided for the crew to the following—

In ships of 500 tons but under 800 tons	..	..	3
In ships of 800 tons but under 3,000 tons	..	..	4
In ships of 3,000 tons or over	..	..	6

(c) In determining the number of water closets required by this paragraph, no account shall be taken of any water closet forming part of a permanent hospital.

(3) The water closets shall be situated close to the sleeping rooms of the persons for whom they are provided and in particular, a water closet shall be situated close to the sleeping rooms of any radio officers in the crew if such sleeping rooms are in a position remote from other sleeping rooms.

(4) If the entrance to a water closet is from an open deck, the entrance shall, if practicable, be properly screened.

(5) If the means of entry into water closets forming part of the crew accommodation is from a passageway leading to other parts of the crew accommodation, a lobby shall be provided at the entrance of the water closet or, where a lobby is not practicable, a self-closing door. Any doors between a water closet and a passageway shall be close fitting and without apertures. The Government Inspector of Shipping may exempt any ship from the requirement that the doors shall be close fitting and without apertures to the extent to which he is satisfied that the exhaust ventilation arrangements from the water closet render compliance therewith unnecessary.

(6) Access to water closets shall not be obtained directly from a mess room or sleeping room. Provided that access to a water closet may be obtained directly from not more than two sleeping rooms altogether accommodating not more than four persons. If the persons so accommodated are three or four in number, the water closet pedestal shall be so screened as to ensure privacy.

(7) Every water closet shall be completely enclosed by bulkheads and shall be provided with exhaust ventilation directly to the open air. Provided that a water closet may be separated by a partition consisting of steel or other opaque and rigid material open at the top and bottom from—

(a) another water closet,

(b) a urinal, or

(c) washing accommodation if the water closet is served by a trunked mechanical ventilation system which effectively removes odours therefrom.

(8) Every water closet shall be so constructed as to facilitate cleaning and not to harbour dirt or vermin.

(9) Subject to the provisions of paragraph (10) of this regulation every water closet shall be provided with the following—

(a) a water closet pedestal of single type with—

(i) a pan of white vitreous china or other suitable material;

(ii) a seat of polished hardwood or other suitable material, with an opening of 4 inches at the front;

(iii) a trap with a metal inspection plate; and

(iv) an efficient ventilator connected to the outlet.

(b) An adequate flush of water, which shall be always available and supplied through self-closing non-concussive supply valves with a portable seating in metal which is not likely to become corroded.

(c) A soil pipe not less than 4 inches in diameter, so constructed as to facilitate cleaning and minimise the risk of obstruction; the pipe shall have a direct overboard outfall fitted with a storm-valve, unless it is connected with a main sewage outfall by an efficient and hygienic system.

(d) A device for holding toilet paper.

(e) A handrail or grip.



(10) Every water closet provided for the exclusive use of such ratings as are referred to in paragraph (2) of regulation 39 of these regulations shall be designed and equipped in a manner suited to the national habits and customs of those ratings and in particular, shall be provided with—

(a) a water closet pedestal of single type with a trapped pan of white vitreous china or other suitable material;

(b) an arrangement which automatically flushes the pan at intervals not exceeding 5 minutes and provides a continuous trickle of water; and

(c) a soil pipe such as is referred to in sub-paragraph (c) of paragraph (9) of this regulation; the pipe shall be fitted with a metal inspection plate and efficient ventilation.

The Government Inspector of Shipping may exempt any ship from the requirements of this paragraph if he is satisfied that the water closets provided for the aforesaid ratings comply with the requirements of paragraph (9) of this regulation and have been properly adapted so as to be suited to the national habits and customs of those ratings.

(11) The provisions of this regulation shall not apply to water closets forming part of a permanent hospital.

29.—(1) Every ship to which these regulations apply shall be provided with a galley for the preparation of food for the crew, unless the circumstances are such that no members of the crew are required to mess on board.

Galleys.

(2) The galley shall be situated as near as may be to the mess rooms provided for the crew and any necessary equipment shall be provided to enable food to be served hot in the mess rooms under all weather conditions.

(3) The galley shall be situated in a position which will prevent, as far as is practicable, the entry into the galley of coal dust from coal chutes or bunker hatchways.

(4) There shall be no direct opening between the galley and any sleeping room. The Government Inspector of Shipping may exempt any ship of under 500 tons from the requirements of this paragraph.

(5) Any galley situated on an open deck shall be provided with weather doors which are horizontally divided into halves, so that the upper half can be opened independently of the lower half, if such a division is necessary for the lighting, ventilation or privacy of the galley or for the service of food therefrom.

(6) Every galley shall, so far as is reasonable and practicable, be lighted by natural lighting from all the sides and from overhead.

(7) Every galley shall be provided with at least three fixed points for artificial lighting, one of which shall be situated close to a cooking range required by this regulation. The Government Inspector of Shipping may exempt any ship of under 1,000 tons from the requirements of this paragraph.

(8) If the galley is situated on an open deck, openings shall be cut in the sides and ends of the galley for ventilation purposes and shall be fitted with dust-tight shutters made of steel or other suitable material and permanently attached to the structure of the galley. The Government Inspector of Shipping may exempt any ship from the requirements of this paragraph if he is satisfied that compliance therewith is unreasonable or impracticable in the circumstances.



(9) Every galley shall be provided with exhaust fans which discharge the fumes into the open air. The Government Inspector of Shipping may exempt from the requirement of this paragraph—

(a) any ship of under 1,000 tons ;

(b) any other ship, if he is satisfied that the galley is so situated that the fumes therefrom can discharge only into the open air.

(10) The floor of the galley shall be provided with gutters and with scuppers which shall be led overboard or to an enclosed tank served by a mechanically operated suction pump. The position and number of the gutters shall be such as will ensure the efficient drainage of the floor.

(11) The cooking appliances in the galley shall be arranged in a manner which will facilitate the cleaning of the galley.

(12) All cupboards and dressers in the galley shall be made of material which is impervious to dirt and moisture and can easily be kept clean. All metal parts of the cupboards and dressers shall be rustproof. The cupboards and dressers shall be so made as not to be likely to harbour dirt or vermin. The bottoms of all cupboards and dressers shall either be flush with the deck or shall be so fitted as to enable the deck space beneath them to be readily accessible for cleaning.

(13) Every galley shall be provided with such equipment as will enable food in sufficient quantity to be properly and readily prepared for the persons whom the galley is intended to serve, and the cooking utensils to be hygienically cleansed.

(14) Without prejudice to the generality of the preceding paragraph—

(a) Every galley shall be provided with one or more cooking appliances with—

(i) a total oven capacity, suitable for roasting and baking, of at least  $\frac{1}{4}$  cubic foot, and

(ii) an area of range top-plate or boiling table, amounting to at least  $\frac{1}{3}$  square foot.

for each person whom the galley is intended to serve. The Government Inspector of Shipping may exempt any ship from any of the requirements of this sub-paragraph in so far as they relate to cooking appliances in galleys intended to serve more than 60 persons, or to the area of any top-plate or boiling table in which electricity or heat-storage is employed, or to the area of any appliance which the Government Inspector of Shipping is satisfied is of unusual design ;

(b) Every galley shall be provided with at least the number of ovens and fire-grates specified in the following table—

<i>Number of persons whom the galley is intended to serve</i>	<i>Number of Ovens</i>	<i>Number of Fire-Grates</i>
Not more than 20 .. .. .	1	1
More than 20, but not more than 30 .. .. .	2	1
More than 30, but not more than 60 .. .. .	2	2
More than 60 .. .. .	3	2

Provided that no fire-grate shall be required in a galley fitted only with electric or gas cooking appliances. The Government Inspector of Shipping may exempt any ship from the requirement of a second fire-grate if he is

satisfied that adequate heat is readily available from one fire-grate and that adequate provision of spare parts is made for such grate and for any equipment necessary for its proper operation.

(c) The top-plate of every cooking range shall be at a height which will enable it to be conveniently used by a person of normal height standing on the floor of the galley, unless a separate boiling table is provided at such a height. The Government Inspector of Shipping may exempt any ship from the requirements of this paragraph, if he is satisfied that compliance therewith is unnecessary by reason of the voyages on which the ship is intended to be engaged or the national habits and customs of the persons whom the galley is intended to serve.

(15) Salt water taps shall not be fitted over a sink in any galley or other place in which food may be prepared for the crew. Hot and cold fresh water shall be laid on to a sink in the galley for washing-up purposes. A connection shall be provided on a water pipe in the galley, and shall be suitable for the connection of a hose with which the floor may be scoured.

30.—(1) In every ship to which these regulations apply, not being a ship in which each member of the crew provides his own food, one or more store rooms shall be provided for the storage of dry provisions for the crew. Such rooms shall be fitted with sufficient shelves, cupboards and bins having regard to the maximum period likely to elapse between successive replenishments of stores and to the maximum number of persons for whom food is to be served.

Dry  
Provision  
store rooms.

(2) Every dry provision store room shall be enclosed by bulkheads constructed of steel or other suitable material.

(3) Access to every dry provision store room shall be obtained from a passageway, galley, pantry or another store room, or from a position on an open deck which, in so far as is reasonable and practicable in the circumstances, shall be a protected position.

(4) Every dry provision store room shall be so situated, constructed and ventilated as to avoid deterioration of the stores through heat, draught, condensation or infestation by insects or vermin.

(5) Without prejudice to the generality of the foregoing paragraph, no dry provision store room shall be situated over a boiler room or any other space in which heat is generated or shall adjoin a galley or machinery casing. The Government Inspector of Shipping may exempt any ship from the requirements of this paragraph if he is satisfied that compliance therewith is unreasonable or impracticable in the circumstances and that the dry provision store room is adequately insulated.

(6) No part of a dry provision store room shall be used for the storage of bedding or textiles.

31.—(1) In every ship to which these regulations apply, refrigerating equipment and cold store rooms shall be provided and shall be, having regard to the period likely to elapse between successive replenishments of stores, adequate for the storage of perishable provisions for the crew. The Government Inspector of Shipping may exempt any ship of under 1,000 tons from the requirements of this paragraph if he is satisfied that the ship is provided with adequate alternative equipment for the storage of perishable provisions.

Cold Store  
Rooms and  
Refrigerating  
Equipment.

(2) Access to every cold store room shall be obtained from a passageway, galley or pantry or from another store room.

## Hospitals.

32.—(1) Every ship to which these regulations apply, being a ship (other than a whale catcher or a tug) which is intended to be at sea on any occasion for a continuous period of more than three days with a crew of 15 or more persons, shall be provided with a space appropriated for use as a permanent hospital for the crew. The space so appropriated shall not at any time be used for any purpose other than for the treatment of sick persons. The Government Inspector of Shipping may exempt from the requirement of this paragraph any ship engaged only on voyages or excursions wholly between ports within Nigeria.

(2) In every other ship to which these regulations apply a room shall be appropriated for use, when necessary, as a temporary hospital. When such room is in use as a hospital it shall not be used for any purpose other than the treatment of sick persons. The Government Inspector of Shipping may exempt any ship from the requirement of this paragraph if he is satisfied that compliance therewith is unnecessary in the circumstances.

(3) Every hospital, whether permanent or temporary, shall be situated in a position which will ensure the greatest possible quiet and comfort for the patients. The hospital shall be readily accessible and, in the case of a ship not carrying a duly qualified medical practitioner or duly qualified nurse exclusively employed as a member of the crew, shall be so situated as to be readily accessible from the sleeping accommodation of the Master of the ship, or of a person appointed by the Master to take charge of the patients. The hospital shall be so situated as to facilitate the proper treatment of patients in all weathers.

(4) The minimum width of the entrance to every permanent hospital shall be 30 inches or as near thereto as is practicable in the circumstances. The hospital shall be so arranged that a stretcher can easily be carried into the hospital and placed alongside at least one single-tier bed therein.

(5) The floor covering in every permanent hospital shall, as far as is practicable be free from joints.

(6) Every permanent hospital shall include a hospital ward fitted on at least two sides with side scuttles at least 12 inches in diameter. The side scuttles shall be capable of being opened. Provided that, if it is not practicable to fit a side scuttle on two sides of the hospital ward, a skylight, capable of being opened and of as large a size as is practicable, may be substituted for a side scuttle on one side of the ward. All side scuttles in the hospital, and any skylight therein which is exposed to the direct rays of the sun, shall be provided with curtains, blinds or jalousies. The Government Inspector of Shipping may exempt from the requirements of this paragraph—

(a) any ship of under 1,000 tons; and

(b) any other ship, if he is satisfied that the permanent hospital therein is fully air-conditioned or served by a trunked mechanical ventilation system.

(7) In addition to any mechanical ventilation required by regulation 13 of these regulations, every permanent hospital shall be provided with adequate natural supply and exhaust ventilation to the open air by means of ventilators, independent of the ventilators provided for any other space in the ship. The Government Inspector of Shipping may exempt any ship from the requirement of this regulation if he is satisfied that compliance therewith is unreasonable or impracticable in the circumstances.

(8) Every permanent hospital shall be provided with an electric fan, unless it is served by a trunked mechanical ventilation system.

(9) Any radiators in a permanent hospital shall be installed as far away as is practicable from the heads of beds.

(10) In addition to the lighting required by regulation 12 of these regulations, every permanent hospital shall be provided with a portable electric lamp and with such accessories as are necessary for its use.

(11) In every ship which is required by this regulation to be provided with a permanent hospital at least one bed shall be provided in a hospital ward for every 50, or fraction of 50, members of the crew. The Government Inspector of Shipping may exempt from the requirement of this paragraph any ship carrying more than 300 persons, to the extent to which he is satisfied that compliance therewith is unreasonable or impracticable in the circumstances.

(12) At least one single-tier bed shall be provided in a ward in every permanent hospital. The bed shall, if practicable, be so arranged as to be accessible from both sides and from the foot. If any beds in the ward are arranged in double tiers, the upper tier shall be hinged or shall be removable. Subject to the foregoing provisions of this paragraph, the provisions of paragraphs (2) to (9) (a) inclusive and paragraph (10) of regulation 18 of these regulations shall apply to hospital beds as they apply to beds in a sleeping room.

(13) In every ward in a permanent hospital one of each of the following items of equipment shall be provided for each bed in the hospital ward and shall be within reach of that bed—

(a) a locker approximately 1 foot square by 2 feet high, and fitted with a flat top and a shelf;

(b) a water bottle; and

(c) a tumbler.

(14) In every ward in a permanent hospital the following items of equipment shall be provided—

(a) seats adequate in number, having regard to the number of beds in the ward;

(b) a clothes locker additional to that required by paragraph (13) of this regulation, and complying with the specifications set forth in sub-paragraph

(a) (ii) of paragraph (1) of regulation 19 of these regulations;

(c) a box cover which will conceal a bed-pan; and

(d) electric bell-pushes so arranged as to be within reach of each bed and communicating with the sleeping room of the person in charge of the patients.

(15) A wash-basin having a capacity of at least 1½ gallons shall be fitted in every permanent hospital. In ships of 5,000 tons or over a bath at least 4 feet 5 inches in internal length shall be fitted in washing accommodation forming part of the hospital and adjacent to the hospital ward. The wash-basin and bath shall be made of or coated with hygienic and durable material having a smooth and impervious surface not likely to crack, flake or become corroded. They shall be fitted with an efficient and hygienic discharge system separate, if practicable, from any other discharge system in the ship and in particular the waste pipes shall be fitted in a manner which will



facilitate cleaning. A scupper at least 2 inches in diameter shall be fitted in the lowest part of any room (other than a ward) which contains such wash-basin or bath. The Government Inspector of Shipping may exempt any ship from the requirement of a bath in a permanent hospital, if he is satisfied that compliance therewith is unreasonable or impracticable in the circumstances.

(16) A water closet pedestal shall be fitted as part of every permanent hospital and it shall comply with the following specifications—

(a) it shall be fitted either in a water closet or in washing accommodation forming part of the hospital ;

(b) access to the water closet pedestal (or washing accommodation, as the case may be) shall be obtained directly from the hospital ward or from a lobby forming part of the hospital. The Government Inspector of Shipping may exempt any ship from the requirement of this sub-paragraph if he is satisfied that compliance therewith is impracticable in the circumstances, and that the water closet forming part of the hospital is situated sufficiently near to the ward ;

(c) the room in which the water closet is installed shall be provided with a gas-tight, self-closing door unless it is served by a mechanical system of exhaust ventilation, and shall be so constructed as to facilitate cleaning and not to harbour dirt or vermin ;

(d) such room shall be ventilated in the manner specified in paragraph (7) of regulation 28 of these regulations and shall comply with the requirements of paragraph (9) or (10) of the said regulation whichever shall be applicable in the circumstances.

(17) In all ships engaged whether temporarily or permanently on voyages to the Persian Gulf area between the months of May and October inclusive, consideration shall, wherever practicable, be given to the provision in every hospital in every such ship for a means of airconditioning of sufficient capacity to maintain 84° fahrenheit (dry bulb) with 52% relative humidity when the ambient conditions are 90° fahrenheit (dry bulb) and 78% relative humidity. This may be by independent unit.

(18) The Government Inspector of Shipping may exempt any ship of under 500 tons from any of the requirements of this regulation.

#### Medical Cabinet.

33.—(1) In every ship to which these regulations apply a medical cabinet shall be provided in a position adjacent to the permanent hospital, if any, required by regulation 32 of these regulations or near to the sleeping room of the person in charge of sick persons on board. The medical cabinet shall be fitted in a position which is remote from all sources of heat, and will remain dry.

(2) The medical cabinet shall be of a size, design and construction suitable for storing the medicines, medical stores and the book of instruction provided in the ship for the benefit of the seamen on board. In particular, the medical cabinet shall be provided with the following—

(a) an outer door fitted with an efficient lock ;

(b) an inner cupboard fitted with a door and a lock which shall be incapable of being opened by the key to the lock referred to in sub-paragraph (a) of this paragraph ; such inner cupboard shall be used solely for the storage of poisonous drugs ;

(c) shelves so constructed as to facilitate the identification of medicines stored thereon ;



(d) a dispensing counter or dispensing table, in either case with a surface which can easily be kept clean ;

(e) at least two drawers suitable for the storage of medical stores and used solely for that purpose ;

(f) fittings which will enable hot water bottles to be carried in a hanging position ;

(g) a rack suitable for holding devices for measuring medicines ;

(h) a book containing readily understandable instructions for the use of medicines and medical stores provided for the crew, unless the ship carries a duly qualified medical practitioner as a member of the crew.

The Government Inspector of Shipping may exempt any ship from the requirements of this paragraph to the extent to which he is satisfied that compliance therewith is impracticable having regard to the size or intended service of the ship.

(3) The medical cabinet shall be lighted by an electric light which shall be inside or immediately outside the cabinet, and which will enable all the contents of the cabinet to be clearly seen in the absence of light from any other source.

(4) The medical cabinet and the place in which it is fitted shall be so ventilated as to avoid deterioration of the contents of the cabinet.

(5) The Government Inspector of Shipping may exempt from any of the requirements of this regulation any ship of under 500 tons, being a ship wholly engaged on voyages or excursions between ports in Nigeria only, if he is satisfied that compliance therewith is unreasonable or impracticable in the circumstances.

34.—(1) In every ship to which these regulations apply, being a ship regularly engaged on voyages to any port to which this regulation relates, the crew accommodation, other than galleys, store rooms and recreation spaces on the open deck shall be provided with protection against the admission of mosquitoes. Such protection shall be provided by means of screens of rust-proof wire or other suitable material which shall be fitted to all side scuttles, natural ventilators, skylights, and doors leading to the open deck.

Protection  
from  
Mosquitoes.

(2) Any door to which such screens are fitted, being a door at the entrance to a permanent or temporary hospital, shall be of a self-closing type.

(3) The ports to which this regulation relates are the following :

(a) Ports between 20° North Latitude and 20° South Latitude on the coasts of—

(i) Asia, including the East Indian Archipelago and the Philippine Islands; but excluding Aden, Bombay, Madras, Vizagapatam, Colombo, Trincomalee, Singapore, Penang and Port Swettenham ;

(ii) Africa, excluding Port Sudan and Massawa ;

(iii) New Guinea, New Britain, New Ireland, New Hebrides and the Solomon Islands ;

(b) Ports on the coasts of Madagascar,

(4) Any ship the crew accommodation of which is fully air conditioned may not be required to comply with all of the requirements of sub-paragraph (1) of this regulation provided that special locking arrangements are incorporated for all side scuttles and windows. Openings which are required by these Rules as means of escape or those forming permanent openings to the open deck, must however, at all times, be adequately fitted with screens.

Maintenance and Inspection of Crew Accommodation.

35.—(1) The crew accommodation in every ship to which these regulations apply shall be maintained in a clean and habitable condition, and all equipment and installations required by these regulations shall be maintained in good working order. Every part of the crew accommodation (not being a store room) shall be kept free of stores and other property not belonging to or provided for the use of persons from whom that part of the accommodation is appropriated, and in particular no cargo shall be kept in any part of the crew accommodation.

(2) The Master of the ship or an officer appointed by him for the purpose shall inspect every part of the crew accommodation at intervals not exceeding seven days, and shall be accompanied on the inspection by one or more members of the crew. The Master of the ship shall cause to be entered in the ship's official log book a record of—

- (a) the time and date of the inspection;
- (b) the names and ranks of the persons making the inspection;
- (c) particulars of any respects in which the crew accommodation or any part thereof was found by any of the persons making the inspection not to comply with these regulations.

Inspection by a Surveyor of ships.

36. The crew accommodation in every ship to which these regulations apply shall be inspected by a surveyor of ships whenever—

- (a) the ship is registered or re-registered in Nigeria;
- (b) any part of the crew accommodation in the ship undergoes substantial alterations or repairs;
- (c) the number of persons accommodated in any sleeping room is increased above that marked in accordance with paragraph (1) of regulation 16 of these regulations;
- (d) in the opinion of a surveyor there is reason to believe (whether or not in consequence of a complaint) that any of the provisions of these regulations has been contravened in respect of that ship, or that any condition subject to which the Government Inspector of Shipping has exempted the ship from a requirement of these regulations has not been satisfied;

(e) a request for an inspection of the crew accommodation has been made to the Government Inspector of Shipping or to a surveyor of ships by or on behalf of the owner of the ship or of any organisation which appears to the Government Inspector of Shipping to be representative of the owners of Nigerian ships or the seamen concerned; or

(f) a complaint has been lodged with a surveyor of ships or with a superintendent or shipping master, which complies with the following requirements—

(i) the complaint shall be in writing, signed by one member of the crew in the case of a ship of under 1,000 tons, and by three members of the crew in the case of any other ship;

(ii) the complaint shall specify the respects in which it is alleged that the crew accommodation in the ship does not comply with these regulations;

(iii) the complaint shall be lodged without undue delay;

(iv) the complaint shall be lodged at least 24 hours before the ship is due to sail, unless the ship is in port for less than 24 hours.

37. In respect of any inspection of a ship carried out for the purposes of sub-paragraphs (b), (c), (d), (e), or (f) of regulation 36 of these regulations, the following fee shall be paid — Fees.

	£	s	d
For each visit to the ship .. .. .	3	15	0
Maximum total fee in each case .. .. .	15	0	0

Provided that no fee shall be payable in respect of an inspection made in pursuance of the aforesaid sub-paragraph (f) if the Government Inspector of Shipping is satisfied that the inspection was made in consequence of an unjustified complaint.

38.—(1) No accommodation provided in compliance with these regulations shall be used, or appropriated for use, by passengers. No galley or store room provided in compliance with these regulations shall be used, or appropriated for use, for the preparation or storage of food for passengers.

Accommodation shared with passengers.

(2) The Government Inspector of Shipping may exempt any ship from the requirements of these regulations, not being requirements relating to sleeping rooms, or office accommodation, to the extent to which he is satisfied that accommodation equal or superior in standard to the accommodation required by these regulations is available for the use of service of the crew in common with passengers.

39.—(1) The Government Inspector of Shipping may exempt —

Additional Exemptions.

(a) any ship while under construction ;

(b) any ship while undergoing trials ;

(c) any ship of under 200 tons ;

(d) any tug ;

(e) any ship which, in his opinion, is primarily employed in a harbour, river, estuary, lake or canal ;

(f) any passenger steamer in respect of which there is in force a passenger certificate of Class III or IV ; and

(g) any ship engaged in the whaling industry ;  
from the requirements of these regulations to the extent to which he is satisfied that compliance therewith is unreasonable or impracticable in the circumstances.

(2) The Government Inspector of Shipping may exempt from the requirements of these Regulations any ship in which by reason of the type of ratings employed, it is necessary to employ a substantially greater number of ratings than would normally be required, if he is satisfied that the ship is provided with crew accommodation for such ratings that is suited to their distinctive national habits and customs and, in the case of mess room, sanitary accommodation and hospitals, is equal or comparable in standard to the crew accommodation required by these regulations.

(3) The Government Inspector of Shipping may, after consultation with the owners of the ship, or such organisation or organisations as appear to him to be representative of owners of Nigerian ships, and with such organisation or organisations as appear to him to be representative of seamen employed in Nigerian ships, exempt any ship from any of the requirements of these regulations if he is satisfied that corresponding advantages are provided in the ship so that the crew accommodation, considered as a whole is equivalent or superior in standard to that required by these regulations.

Non-  
deductible  
space.

40. In the measurement of a ship to which these regulations apply for the purpose of ascertaining her registered tonnage no deduction shall be allowed for—

(a) any space appropriated for the storage of fresh water for the use of the crew;

(b) any excess in volume of the space appropriated for the storage of provisions (other than fresh water) for the crew over 15 per cent of the total volume of the other spaces provided in the ship as crew accommodation and accommodation for the Master of the ship; and

(c) any space forming part of the crew accommodation which has not been first included in the measurement of the ship's tonnage.

*Regulations 3 and 13 (3)*

## FIRST SCHEDULE

### TRUNKED MECHANICAL VENTILATION SYSTEM

1. The trunked mechanical ventilation system referred to in Regulation 3 and paragraph (3) of Regulation 13 of these Regulations (in this Schedule referred to as "the system") shall, in relation to the spaces specified in the second column of Table I annexed hereto, be capable of the respective standards of performance specified in the third or fourth column of that Table, whichever standard shall be the higher in the circumstances. Provided that nothing in Table I shall be taken to relate to a space specified in the second column of Table II annexed hereto.

2. The system shall, in relation to the spaces specified in the second column of Table II, be capable of the respective standards of performance specified in third and fourth columns of that Table.

3. If any store room is served by a fan which provides warmed air for any other space, the store room shall be provided with ventilation trunking separate from that serving such other space.

4. The clear area of the exhaust openings provided in conjunction with the system shall be sufficient to ensure that the velocity of air at each exhaust opening does not exceed 1,000 feet per minute when the system is in operation.

5. The speed of every supply fan forming part of the system shall be capable of being varied, where direct current motors are used.

6. The system shall be quiet in operation.

7. All trunking forming part of the system shall be provided with non-return flaps where such flaps are necessary for the exclusion of effluvia and the preservation of the health of the crew.

8. If the system is designed to circulate heated air as the sole means of heating the crew accommodation, the system shall be sub-divided into sections which can be separately controlled to the extent necessary to enable a comfortable temperature to be maintained in all parts of the crew accommodation.



TABLE 1

1 Category	2 Space	3 Fresh air changes per hour	4 Volume of fresh air, in cubic feet per minute, for each person likely to use the room at any one time
A	Rooms (other than rooms in Category C) in deck houses above the upper or shelter deck :—		
	(1) outside rooms (other than rooms adjoining machinery casing)	10	50
	(2) inside rooms and rooms adjoining machinery casing	15	50
B	Rooms (other than rooms in Category C) in side-to-side superstructures above the upper or shelter deck :—		
	(1) outside rooms (other than rooms adjoining machinery casing)	12	50
	(2) inside rooms and rooms adjoining machinery casing	15	50
C	Mess rooms, smoking rooms and recreation rooms (in each case above the upper or shelter deck) :—		
	(1) not adjoining machinery casing	15	25 (a)
	(2) adjoining machinery casing	18	25 (a)
D	Passageways adjoining machinery casings	4	
E	Rooms in between decks (including shelter between decks) of ships propelled by internal combustion machinery :—		
	(1) Rooms clear of machinery casing	12	50
	(2) Rooms abreast of but not adjoining machinery casing	12	50
	(3) Rooms adjoining machinery casing (other than mess rooms, smoking rooms and recreation rooms)	15	60
	(4) Mess rooms, smoking rooms and recreation rooms (in each case adjoining machinery casing)	18	25
F	Rooms in between decks (including shelter between decks) of steamships :—		
	(1) Rooms clear of machinery casing	12	50
	(2) Rooms abreast of, but not adjoining machinery casing	15	60
	(3) Rooms immediately above machinery casing or abreast of and adjoining machinery casing (other than mess rooms, smoking rooms and recreation rooms)	18	60
	(4) Mess rooms, smoking rooms and recreation rooms (in each case adjoining machinery casing)	20	30 (b)

(a) Whatever the number of persons likely to use the room at any one time, the total volume of fresh air per minute shall not be required to be such as would result in more than 20 fresh changes per hour.

(b) Whatever the number of persons likely to use the room at any one time, the total volume of fresh air per minute shall not be required to be such as would result more than 25 fresh air changes per hour.

TABLE II

1 Category	2 Space	3 Fresh air changes per hour		4
		Supply	Exhaust	
G	Galleys	20 (c) (d)	40 (d)	
H	Sanitary accommodation, drying rooms and pantries	10	—	
J	Wards in permanent hospitals	12 or such greater number as would result in the supply of not less than 50 cubic feet of fresh air per minute for each bed in the room.	—	
K	Dry provision store rooms	Not less than 10 (e) and not more than 20.	—	

(c) 15, if at least two sides of the galley are exposed to the weather.

(d) The Government Inspector of Shipping may exempt any ship from these requirements to the extent that he is satisfied that compliance therewith is unnecessary by reason of the insulation of the equipment in the galley, or by reason of the size of the galley.

(e) Subject to the provisions of Regulation 30 (4).

## SECOND SCHEDULE

*Regulations 8 (2)  
and 9 (3)*

## DECK SHEATHINGS

1. The material referred to in paragraph (2) of Regulation 8 and paragraph (3) of Regulation 9 of these Regulations (in this Schedule referred to as "the material") shall comply with the following requirements:—

(a) Foothold. The material, whether wet or dry, shall provide a good foothold.

(b) Thermal Insulation.

(i) If the material covers a deck exposed to the weather, it shall provide thermal insulation not less than that provided by a wooden deck  $2\frac{1}{2}$  inches thick.

(ii) If the material covers any other deck, it shall provide a warm and comfortable surface.

(c) Fire Resistance. The material shall be such as will not readily ignite in the position in which it is laid.

(d) Water Absorption. The material shall be such that, after being immersed in water for a period of 48 hours, the moisture content of the material will not exceed 7 per cent of its dry weight. The Government Inspector of Shipping may exempt any ship from the requirement of this sub-paragraph.

(e) Adhesion. The material shall be so laid as to adhere closely under all conditions of service to the surface on which it is laid.

(f) Non-corrosion. The material shall not contain any substance which may cause corrosion of the deck on which it is laid, unless the deck is effectively protected from corrosion by a coating applied for that purpose.

(g) Danger to persons. The material shall be such as will not produce any injurious effect upon persons who may come in contact with it.

(h) Resistance to wear and weather. The material shall be sufficiently hard and strong to withstand all conditions of service and shall be sufficiently flexible to prevent cracking under those conditions.

2. If the material is laid in a permanent hospital, it shall be material not likely to be damaged by surgical spirit or other liquids which may be used in the hospital.

3. If the material is laid on the crown of an oil fuel tank, the material shall be such that if it is immersed in fuel oil for a period of 24 hours at a temperature of 150 F. the weight of the material will not increase by more than 1 per cent and the material will not be penetrated by the oil.

## THIRD SCHEDULE

Regulation 8 (2)

## INSULATING MATERIAL FOR THE UNDERSIDE OF DECKS

The insulating material referred to in paragraph (2) of Regulation 8 of these Regulations (in this Schedule referred to as "the material") shall comply with the following requirements:—

(a) Thermal Insulation. The material shall provide thermal insulation not less than that provided by a wooden deck 2½ in. thick.

(b) Fire Resistance. The material shall be such as will not readily ignite in the position in which it is laid.

(c) Adhesion. The material shall be so laid as to adhere closely under all conditions of service to the deck under which it is laid.

(d) Non-corrosion. The material shall not contain any substance which may cause corrosion of the deck under which it is laid, unless the deck is effectively protected from corrosion by a coating applied for that purpose.

## FOURTH SCHEDULE

Regulation 16

## MARKING

## PART I

## MARKINGS FOR SLEEPING ROOMS

Certified for (a)\* seamen.

Certified for (b)\* seamen.

Certified for (a)\* seamen or (b)\* seamen.

## PART II

## MARKINGS FOR SPACES OTHER THAN SLEEPING ROOMS

Certified for Chief Officer (c)\*.

Certified for Officers.

Certified for Petty Officers.

Certified for Apprentices.

Certified for Crew.

(a)\* There shall here be inserted the maximum number of seamen who may be accommodated in the room in accordance with these Regulations when it is not appropriated for use solely by such ratings as are referred to in Regulation 39 (2).



(b)\* There shall here be inserted the maximum number of seamen who may be accommodated in the room in accordance with these Regulations when it is appropriated for use solely by such ratings as are referred to in Regulation 39.(2).

(c)\* In the case of a room intended for the sole use of any other Officer the rank of that Officer shall here be substituted.

MADE at Lagos this 11th day of June, 1964.

R. A. NJOKU,  
*Federal Minister of Transport*

#### EXPLANATORY NOTE

These regulations govern the crew accommodation to be provided in sea-going ships registered in Nigeria (other than fishing boats, and, pleasure yachts) and implement in this respect Convention No. 68 concerning Food and Catering for Crews on Board Ship adopted by the International Labour Conference at Seattle in 1946 and Convention No. 92 concerning Crew Accommodation on Board Ship adopted by the International Labour Conference at Geneva in 1949.