

1.7. MERCHANT SHIP AND R.F.A. EQUIPMENTS

1. **International Rules and Requirements.** The Merchant Shipping (Radio) Rules, 1965 which came into force in May of that year, outline the rules and equipment requirements for merchant ships to a scale dependent on type and tonnage.

2. Classification of Merchant Ships

- a. CLASS 1. Steamers licensed to carry more than 250 passengers.
- b. CLASS 2.
 - (1) Passenger steamers other than those of class 1.
 - (2) Cargo ships of 1600 tons and upwards.
- c. CLASS 3. Cargo ships of between 500 and 1,600 tons.
- d. CLASS 4. Cargo ships of between 300 and 500 tons.
- e. Classes 1 and 2 are subject to the rules for radio-telegraph ships, classes 3 and 4 to those for radio-telephone ships. -

3. **Requirements.** The following are the general minimum requirements for merchant ships:

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| a. AUTO ALARM | Obligatory to classes 1 and 2 |
| b. ALARM GENERATING DEVICE | Obligatory in all classes |
| c. EMERGENCY INSTALLATIONS | Transmitter and receiver separate from the main installations are obligatory in classes 1 and 2 |
| d. LOUDSPEAKER WATCH FACILITIES | Obligatory in all classes. May be provided by the reserve or auto-alarm receiver in radio-telegraph ships |
| e. DIRECTION FINDING EQUIPMENT | Obligatory in ships over 1,600 tons |
| f. MAIN RADIO TELEGRAPH INSTALLATION | Transmitter and receiver, obligatory in classes 1 and 2 |
| g. MAIN RADIO TELEPHONE INSTALLATION | Obligatory in classes 3 and 4 |
| h. VHF (FM) EQUIPMENT | Not obligatory for any category, but is widely fitted in large merchant ships |

4. **Types of Equipment.** The performance specifications of the equipment used are required to include the following facilities:

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| a. MAIN RADIO TELEGRAPH TRANSMITTER | MF, CW and MCW on 500 kHz and at least four other spot frequencies in the range 405 to 525 kHz. Normally covers MF/HF 365 to 540 kHz and 3 to 23 MHz, e.g. Worldspan, Oceanspan, Globespan |
| b. RESERVE RADIO TELEGRAPH TRANSMITTER | MF CW on 500 kHz |
| c. RESERVE RADIO TELEGRAPH RECEIVER | Frequency coverage 405 to 535 kHz, 1,605 to 3,800 kHz and through maritime mobile bands between 4 and 23 MHz |
| d. DF EQUIPMENT | Frequency coverage 255 to 525 kHz |
| e. VHF EQUIPMENT | Frequency coverage 156 to 162 MHz |

5. **Merchant Shipping War Requirements.** The minimum requirements listed above are laid down in statutory regulations issued by the Ministry of Transport. Technical specifications are issued by the GPO. In addition to the statutory regulations, MOD (Navy) lays down certain wartime requirements. Although it would be ideal if ships conformed to these regulations in peacetime, it is not practicable to order them to do so. By close co-operation between all concerned the requirements are fulfilled as far as possible, and space left for the necessary equipment to be quickly fitted on the outbreak of war.

6. **MOD (Navy) Desired Additional Radio Communication Equipment.** The following radio equipment is desired by the MOD (Navy) to be fitted in time of war. This equipment is additional to that required by statutory regulations.

a. SHIPS ABOVE 1600 GROSS TONS.

(1) *HF*

(a) Main Transmitter

Power output – minimum – 100 watts

aim – 200 watts or more

See notes (i) and (ii)

(b) Emergency and Secondary Transmitters

HF frequency range need not extend above 13 MHz

Frequency range up to 23 MHz desirable

Power Supply – batteries of same endurance as required for emergency (Rescue) MF transmitter

See notes (i), (ii), (iii) and (iv)

(c) Receiving Equipment

Receiving equipment corresponding to the frequency range of the HF main transmitter

See notes (i) and (ii)

(d) Emergency Receiving Equipment

Emergency receiving equipment corresponding to the frequency range of the HF Emergency transmitter

See notes (i), (ii), (iii) and (iv)

Notes

(i) This equipment may be combined with the MF equipment required by International regulations

(ii) Where ship owners do not feel justified in fitting such equipment in peacetime, it is strongly urged that space be allocated and reserved for installation during war.

(iii) This equipment shall be fitted in a compartment sited as far as practicable from the ship's radio office, and in such a position as is afforded as much protection as possible.

(iv) This equipment shall use an aerial or aeriels other than those used for the ship's normal equipment.

(2) *VHF/FM Equipment.* In time of war, VHF/FM transmit and receive equipment is a requirement for Convoy Tactical Communications and, therefore, should be fitted in all Allied Merchant Ships. VHF/FM has a world-wide peacetime application and, ideally, merchant ships of all nations should eventually be so fitted. NATO nations should encourage their shipping authorities to fit VHF/FM in all ships. This equipment should be located as near the bridge as possible.

b. SHIPS BELOW 1600 GROSS TONS (other than harbour craft). VHF/FM Equipment. In the event of war, such of these ships as are detailed to proceed in convoy will require VHF/FM transmit and receive equipment for Convoy Tactical Communications. This equipment should be located as near the bridge as possible.

c. OTHER SHIPS. If vessels in this class are required to proceed more than 300 miles from land, National Naval Ministries should arrange to fit such additional radio communications equipment as may be thought necessary for the vessel's safety.

7. **Capabilities of MF/HF Transmitter Equipments**

a. OCEANSPAN: MARCONI MARINE RADIO TRANSMITTER NS301

Frequency range: 410 to 512 kHz, 4 to 22 MHz with 37 preset frequencies.

Facilities MF CW/MCW

HF CW/Voice

Power output 100 to 120 watts

Frequency stability MF 0.02%
HF 0.005%

b. GLOBESPAN: MARCONI MARINE RADIO TRANSMITTER NT302

Frequency range: 405 to 525 kHz (7 preset channels)

1.6 to 3.8 MHz

4, 6, 8, 12, 16 and 22 MHz maritime bands with 5 preset channels in each band

Facilities: MF – CW/MCW
IF – CW/MCW/Voice
HF – CW/Voice

Power output: MF – 275 watts
IF – 100 watts
HF – 400 watts

Frequency stability: MF – .02%
HF – .001%

c. WORLDSPAN: MARCONI MARINE RADIO TRANSMITTER

Frequency range: 365 to 540 kHz

3 to 23 MHz

Facilities: CW/MCW/Voice

Power output: Medium

d. DS9B: INTERNATIONAL MARINE RADIO TRANSCEIVER

Frequency range: 2.5 to 22 MHz

Facilities: General purpose SSB transceiver

Power output: Low

e. TRANSARCTIC: MARCONI MARINE TRANSCEIVER

Frequency range: Transmitter: 375 to 500 kHz and 1.5 to 13 MHz

Receiver: 180 to 520 kHz and 600 kHz to 13 MHz

Facilities: CW/MCW/Voice

Power output: 45 to 70 watts according to emission

Frequency stability: MF – 0.1%
HF – 0.02%

8. Capabilities of MF/HF Receiver Equipments

a. MERCURY: MARCONI MARINE RADIO RECEIVER NS601

Frequency range: 15 to 40 kHz and 100 kHz to 4 MHz

b. ELECTRA: MARCONI MARINE RADIO RECEIVER NS301

Frequency range: 250 to 520 kHz and 1.5 to 25 MHz

c. ATLANTA: MARCONI MARINE RADIO RECEIVER NS702

Frequency range: 15 kHz to 28 MHz

d. LODESTONE: MARCONI MARINE RADIO RECEIVER ND101

Frequency range: 250 to 550 kHz

9. Capabilities of VHF Equipments

a. ARGONAUT: MARCONI MARINE VHF TRANSCEIVER NTS403

Frequency range: Transmitter: 156 to 158.8 MHz

Receiver: 156 to 163.4 MHz (available in 40 channels with provision for 7 to 10 extra channels if required)

Power output: 20 watts

10. Capabilities of Emergency Equipments

a. RELIANCE: MARCONI MARINE EMERGENCY RADIO TRANSMITTER NT102

Frequency range: 365 to 525 kHz

Facilities: CW/MCW

Power output: 120 watts

b. LIFELINE: MARCONI PORTABLE EMERGENCY TRANSMITTER TYPE 600

Frequency: 2182 kHz

Facility: Voice or two-tone alarm

Power output: 1.4 watts

c. SALWITA: MARCONI MARINE LIFEBOAT TRANSMITTER TYPE NTS303

Frequencies: Transmitter: 500 kHz crystal controlled
8364 kHz crystal controlled
500 kHz crystal controlled

Facility: MCW

Power output: 3.5 watts

d. AUTOKEY: MARCONI MARINE AUTOMATIC SENDER NM102. Fitted to key either an alarm or distress signal automatically.

e. VIGILANT: MARCONI AUTO ALARM RECEIVING APPARATUS NS102. A receiver for 500 kHz, incorporating a bell alarm operated on receipt of the full automatic alarm. This equipment is now being superseded by SAFEGUARD.

f. SEAGUARD: MARCONI AUTOMATIC ALARM RECEIVING APPARATUS NS703. A later model receiver to VIGILANT covering the frequency range 487 to 512 kHz, incorporating a bell alarm operated on receipt of the first dashes of the automatic alarm.

g. ALERT: MARCONI MARINE EMERGENCY GUARD RADIO RECEIVER NS101. An emergency receiver operable only on 500 kHz.

11. Royal Fleet Auxiliaries

a. EQUIPMENT. The required standards of equipment for R.F.A.s are laid down in current D.C.I.s. They are at present similar to the statutory regulations for merchant ships with the following additions:

- (1) Facility for Continuous Tuning on the Main Transmitter. VFO attachments are being fitted to the normal commercial transmitters.
- (2) UHF Transceiver. Type 691/CUH, and/or Type 692/CUJ, are fitted in R.F.A.s of over 1000 tons for short range communication with H.M. ships in peace and war.
- (3) VHF Transceiver, a wartime requirement only. Type 689, for communication within a convoy.
- (4) Low Power HF Transmitter and Receiver. With voice facilities and emergency power arrangements. For communication on tactical and command nets.
- (5) Ratt. A Broadcast Bay and a Tactical Bay in R.A.S. – fitted ships only.

b. PERSONNEL. All R.F.A.s carry a civilian radio officer. In addition some of the larger and more modern R.F.A.s carry naval personnel permanently and have extra equipment. The majority of R.F.A.s, however, have no naval communication ratings as complement but some are normally drafted for exercise periods.