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Wartime Instructions for Merchant Ships

VOLUME 3

RADIO PROCEDURE

WIMS 3

NAVY DEPARTMENT,
WASHINGTON

ADMIRALTY,
LONDON

PAGE 1 ORIGINAL

These instructions have been approved by the Secretary of the Navy and the Lords Commissioners of the Admiralty and are promulgated to United Nations' Merchant Shipping for information, guidance and necessary action.

H.V. Markham
By Command of Their Lordships

Ralph A. Bard
Acting Secretary of the Navy

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PAGE IV ORIGINAL

RECORD OF ENTRY OF CHANGES

Corrections to WIMS 3 will be made by the following means:

a. Printed Changes

b. British BAMS Lettered Messages

c. U.S. BAMS Numbered Messages

A record of entry of printed changes will be made in this section. Material promulgated by Lettered or Numbered Messages will be included in a subsequent printed change. Prior to the receipt of these changes, Lettered and Numbered Messages affecting WIMS 3 should be retained in file, until included in a printed change.

Change No.	Authority (S.C. No.)	Signature and Rank or Rating	Date of Entry
No. 1	S.C. 34/44	[illegible] TACO	[illegible]
No. 2	S.C. 6/45	[illegible] TACO	[illegible]
No. 3	S.C. 20/45	[illegible] TACO	[illegible]
No. 4	S.C. 23/45	[illegible] TACO	[illegible]
No. 5	S.C. 32/45	[illegible] TACO	[illegible]
No. 6	[illegible]	[illegible]	[illegible]
No. 7	[illegible]	[illegible]	[illegible]

RECORD OF ENTRY OF CHANGES

(continued)

Change No.	Authority (S C, No.)	Signature and Rank or Rating	Date of Entry

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Change Number 7 includes relevant dispatch corrections up to and including British BAMS Lettered Message RN, British BAMS Non-Combat Area Lettered Message NCG, British BAMS War Zone Lettered Message WZA. U. S. BAMS Numbered Message 93, U. S. BAMS Non-Combat Area Numbered Message NC7, and U. S. BAMS War Zone Numbered Message WZ4.

● CUSTODY

When the ship is at sea, this book is to be kept in the Radio Office. In a harbor, the Master is personally responsible for its custody.

● DESTRUCTION

If the ship is in danger of sinking or capture or if it becomes necessary to scuttle the ship, this book is to be thrown overboard in the metal box provided in the Radio Office. Where this equipment is not carried, the book is to be destroyed by burning if possible; otherwise it should be put in a weighted bag equipped with grommets to admit water readily and thrown overboard in deep water.

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● PREFACE

(a) This publication has been produced for the guidance of Masters, Officers in Charge of Radio Communications and Radio Officers of the United Nations Merchant Navies in time of war.

(b) Normal commercial radio procedure must, of necessity, be modified by wartime conditions and the instructions contained in this book are, therefore, supplementary to and in some cases supersede normal commercial operating.

(c) It is the duty of every Master, Officer in Charge of Radio Communications and Radio Officer to become familiar with the instructions set out in this publication. The safety of the ship, and in some cases that of a whole convoy, may well depend on the knowledge and ability of the officers who direct the use of and operate the radio equipment on board.

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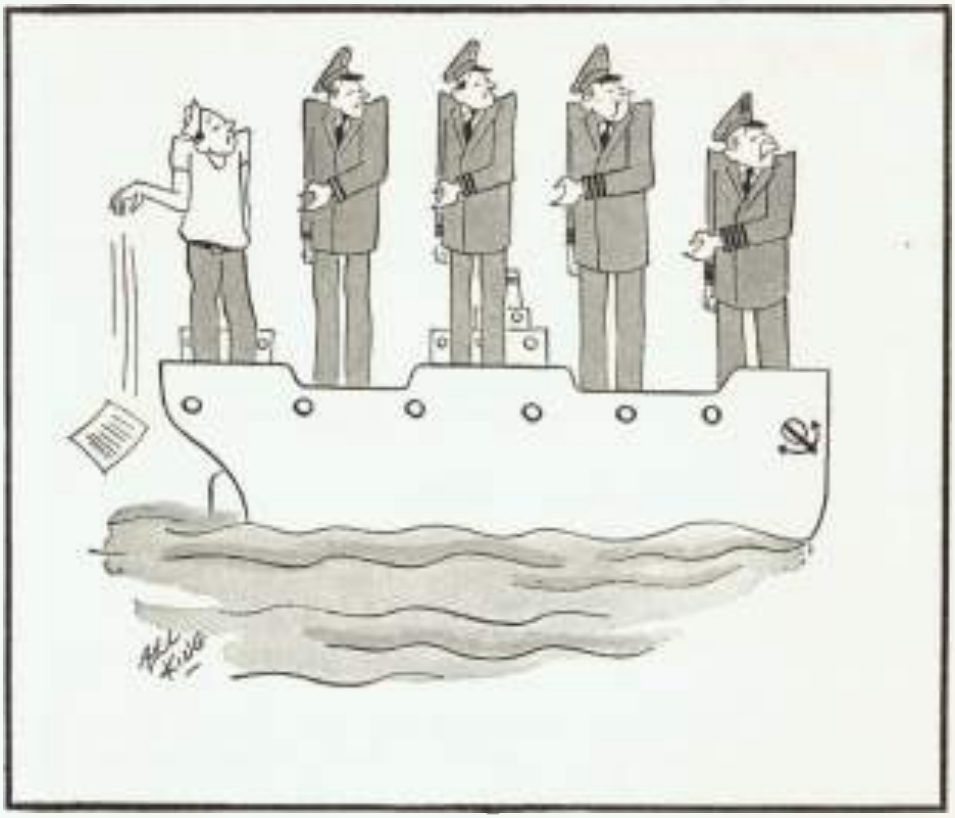
● APPENDICES

CHAPTER 1



RESPONSIBILITIES OF MASTERS, U.S. NAVY COMMUNICATION AND ARMED GUARD OFFICERS AND RADIO OFFICERS.

The Admiralty and Navy Department

ARTICLE 1

(a) The Admiralty and Navy Department are responsible for the efficient organization of all radio communication insofar as it may concern shipping.

Master

ARTICLE 2

(a) The Master is responsible for the maintenance of radio equipment and the conduct of communications on board his ship.

(b) He is responsible that the Officer in Charge of Radio Communications, when aboard, and ALL his Radio Officers are fully acquainted with the instructions necessary for the efficient performance of their duties and must insure that any orders received concerning radio are shown to the Officer in Charge of Radio Communications immediately.

(c) He is responsible for the allocation of duties to be performed by the radio personnel in time of emergency. These "battle stations" will vary according to the size of the staff, the radio organization in force, the disposition of equipment, etc. The Senior Radio Officer is always to be assigned to the Radio Office during any emergency.

(d) When sailing independently, he is responsible that the ship's position is given to the Radio Officer on Watch. (See Article 122.)

(e) He is responsible that the Radio Officer on Watch is notified immediately the ship is in fog, when she changes her position in convoy, when she struggles, or when she is under attack.

(f) He is responsible for insuring that adequate means of communication exist between the bridge and Radio Office and that arrangements are made for calling reliefs in good time, for in no circumstances is the Radio Officer to leave his post while on watch.

(g) The Master and at least one other officer, designated by him, shall be thoroughly familiar with coding methods. In the allocation of these duties due consideration should be given battle station details. (See paragraph (e) above.)

Radio Officers in British Managed Ships

ARTICLE 3

(a) The Senior Radio Officer is directly responsible to the Master for the efficiency of his department and for the instruction and actions of all other Radio Officers on board.

(b) Radio Officers when on watch in accordance with the instructions contained in WIMS 3, Chapter 10, must never be ordered to leave the Radio Office for the purpose of performing visual signaling duties on the bridge. Radio Officers may, however, perform visual signaling duties *when off watch*, on a purely voluntary basis.

CHAPTER 1

RESPONSIBILITIES

ARTICLE 4

Radio Officers in U.S. Managed Ships

(a) The Senior Commercial Radio Officer is directly responsible to the Master for the proper maintenance of all radio equipment except on board those vessels carrying U. S. Army radio technicians. In addition, *in the absence of a U.S. Navy Communication Liaison Officer or Armed Guard Officer*, the Senior Radio Officer is directly responsible to the Master of the ship for the efficient operation of the Radio Office and for the supervision and instruction of all Radio Officers on board.

ARTICLE 5

U.S. Navy Communication Liaison Officers and U.S. Navy Armed Guard Officers

(a) On U.S. managed ships, in the absence of the U.S. Navy Communication Liaison Officer the Armed Guard Officer shall act in that capacity.

(b) On U.S. managed ships other than U.S. Convoy Flag Ships or U.S. Army Transports having U.S. Army technicians on board, the U.S. Navy Communication Liaison Officer shall be responsible to the Master for the efficient conduct of communications except for the maintenance of radio equipment. All communication personnel shall be under his *immediate* supervision as to watches, operations and performance of their duties in all matters relative to Wartime Merchant Ship Communications.

(c) On all acting U.S. Convoy Flag Ships having a U.S. Navy Convoy Commodore or Vice Commodore on board, all communications shall be under the *immediate* supervision of the Communication Officer attached to the staff of such U.S. Navy Officer; however, the Senior Radio Officer shall be responsible to the Master for the maintenance of all radio equipment.

(d) On U.S. Army Transports not having a U.S. Navy Commodore or Vice Commodore on board, the U.S. Navy Communication Officer shall be in charge of and responsible to the Master of the ship for all communications, unless U.S. Army radio technicians are assigned on board. If U.S. Army technicians are on board, the U.S. Navy Communication Officer shall be responsible to the Master for all visual communications and shall act as Communication Advisor to the U.S. Army Commanding Officer of Troops as concerns radio communication. The Commanding Officer of Troops shall be responsible to the Master for the maintenance of equipment and the operation of the Radio Office.

CHAPTER 2

Sealed Transmitter

FUNDAMENTALS OF WARTIME RADIO ORGANIZATION.

Introduction

ARTICLE 9

(a) Wartime radio organization for merchant ships is designed to meet two principal wartime communication requirements. These are:

(1) To insure immediate transmission to, and correct reception by, merchant ships of orders and information issued by responsible Naval Authorities.

(2) To insure that adequate facilities are at all times available for ships at sea to communicate with the shore, and that every message transmitted by a ship is received and delivered without delay to the responsible Naval Authorities ashore.

(b) In addition a very comprehensive Naval Communication Organization, utilizing both radio and cables, is operating quite independently of the radio organization for merchant ships, and any message received by a shore station from a merchant ship will be passed rapidly to the appropriate addressees through Naval channels. Once reasonably certain that a message has been received by a shore station or warship, therefore, a merchant ship should not be over-anxious to contact some particular station, especially when at a considerable distance from land.

Methods of Communication

ARTICLE 10

(a) There are two principal methods of radio communication used by merchant ships in time of war. These are:

(1) **The Direct Method.** In this method the transmitting and receiving stations communicate directly with each other.

(2) **The Broadcast Method.** In this method the transmitting station only breaks silence. The receiving station gives no indication whatsoever of its presence. The transmitting station broadcasts the call and message, but no answer or acknowledgment is made.

Communication from Shore to Ship

ARTICLE 11

(a) In the transmission of messages originated by the shore authorities for the ships at sea, communication from shore to ship will invariably be by *broadcast method*.

Communication from Ship to Shore

ARTICLE 12

(a) Wartime radio organization provides for communication from ship to shore at any time without delay either on 500 kcs (600 meters) or H/F. The *direct method* should be used except for Distress Messages, which are always to be broadcast. (See Appendix A and Appendix F for list of shore stations maintaining listening watches.)

ARTICLE 13

Communication in Harbor

(a) During war, the use, control, supervision, inspection and closure of radio stations on all merchant ships in ports and inland waters are governed in accordance with instructions issued by the appropriate authorities. (See Appendix H for U. S. and Appendix I for British Ports.) Instructions governing the use of radio in specific harbors and inland waters may be issued locally by Naval or other authorities.

(b) While in harbor, no messages, other than Distress Messages, are to be transmitted by radio from a merchant ship. If it is necessary to pass a message by radio or cable, it is to be taken to the Local Naval Authority for coding (where applicable) and transmission. If there is no Allied Naval Authority at the port, application should be made to the Consul.

CHAPTER 3

RADIO SECURITY.

Danger of the Use of Radio at Sea

ARTICLE 18

(a) Thoughtless or indiscriminate use of radio will involve the transmitting ship, and possibly other ships as well, in grave danger.

(b) Enemy vessels or aircraft equipped with D/F apparatus may take bearings of a merchant ship's transmissions, which may lead to her location and destruction. Even a very short transmission is sufficient to enable a D/F bearing to be taken.

(c) When absolutely necessary to send a message, therefore, H/F transmission, if available, should be used whenever practicable. The risk of detection is thereby reduced, but enemy H/F D/F stations may nevertheless obtain a bearing. Lengthy transmissions on any frequency are consequently to be avoided as far as possible.

(d) Paragraph (c), however, does not apply to the transmission of a Distress Message. In this case the initial transmission must always be made on 500 kcs (600 meters) to insure the reception by other ships in the vicinity.

Preservation of Radio Silence

ARTICLE 19

(a) Radio silence is imposed on all merchant ships at sea for their own safety, and transmission by radio is forbidden except to send a Distress Message, or message, in accordance with some special order given by the Naval Authorities or the Master. (see Articles 74,130.)

(b) No radio message or signal may be transmitted or answered without the permission of the Master or Deck Officer of the Watch. If, however, the ship is in distress and circumstances prevent the Radio Officer obtaining this permission, he is to use his discretion and be prepared to act independently.

Deceptive Calls and Messages

ARTICLE 20

(a) *Beware of deceptive calls and messages.* An enemy ship may attempt to decoy a merchant ship by using a call sign just broadcast, by using call signs of United Nations warships, or by sending "SOS" or other urgent signals. Except in the case of distress, a radio call, if authentic, will always be followed by a broadcast message, the decoded text of which will indicate if the ship is required to report, reply or acknowledge by radio. If no such indication is contained in the message, radio silence is not to be broken.

Radiation from Oscillating Receivers

ARTICLE 21

(a) Certain types of radio receivers radiate sufficient energy to permit enemy vessels operating nearby to obtain D/F bearings. A list of receivers

which have been tested and approved as being of a non-radiating type is given in Appendix D. All other receivers are considered to be *non-approved* and liable to cause radiation. In certain circumstances, however, the importance of receiving diversion and other official messages outweighs the possible danger from the use of *non-approved* receivers. The instructions contained in the following paragraphs, must, therefore, be strictly observed.

(b) *Communication Receivers*

(1) *Approved* communication receivers may be used at any time.

(2) Ships, whether in convoy or sailing independently, are to read BAMS routines in accordance with the instructions in this publication, even though their receivers may be *non-approved*

(3) Ships with *non-approved* receivers should not normally maintain watch on 500 kcs (600 meters). An exception, however, occurs when a ship is sailing in convoy under Convoy Radio Organization "B". Watch on 500 kcs (600 meters) is then to be maintained by *all* ships, even though their receivers are *non-approved*. (see Article 84.)

(4) *Non-approved* receivers may also be used when ordered on 2410 kcs (124.5 meters) in ships sailing in U.K. Coastal Convoys.

(c) *Direction-Finding Receivers*—

(1) *Approved* D/F receivers may be used at any time.

(2) *Non-approved* D/F receivers are only to be used on receipt of specific instructions from the Escort Commander or Convoy Commodore (when in convoy) or from the Master if sailing independently.

(d) *Broadcast Receivers*—

(1) *Approved* broadcast receivers may be used at sea provided they are connected to their own independent aerials. No aerials used in connection with a broadcast receiver may be erected within a radius of 50 feet of a direction-finding aerial; nor may any such aerial be erected in a position where it is liable to cause interference with any other of the ship's radio installations.

(2) *While at sea, non-approved broadcast receivers are not to be used under any circumstances.* (see Appendices H and I.)

ARTICLE 22 Radiation from Other Electrical Apparatus

(a) Many electrical devices in common use on board ship if out of adjustment are capable of producing noise in radio receivers, and in extreme cases this electrical noise may be detected at some distance from the ship.

(b) The source of such disturbance may often be located by a process of elimination, and every effort should be made to locate and if possible remedy the trouble.

(c) Radio Officers are required to log details of all interference observed, and they should record particulars of the measures taken to trace and rectify it. In cases where the source of interference cannot be traced or the trouble eliminated, a written report should be made to the Master.

(d) *Morse code practice.*

(1) Reports have been received of personnel practicing morse transmitting by various methods such as tuning in telephony carriers on H F and keying with a morse key in series with the telephones. This is not permissable.

(2) Personnel also practice transmutting with buzzers and audio oscillators. Although the danger of radiation is negligible this practice is most undesirable.

(3) The use of buzzers for transmission practice at sea is to be confined to equipment approved by the Chief Radio Officer, and such equipment is not to be installed in the Radio Office.

Access to Radio Office

ARTICLE 23

(a) At all times while the ship is at sea persons who are required to enter the Radio Office for the performance of, or in the execution of their duty, must have ready access to it. No other person is to be permitted to enter the Radio Office.

(b) If for any reason it should be necessary to leave the Radio Office unattended while the ship is at sea, it is to be locked and the key given to the Deck Officer of the Watch.

Merchant Ships Fitted with Radar —Security Arrangements

ARTICLE 24

(a) The attention of Masters of merchant ships fitted with Radar is drawn to paragraph 4 of "Instructions for the Use of Radar in Merchant Ships" (C.B. 3108).

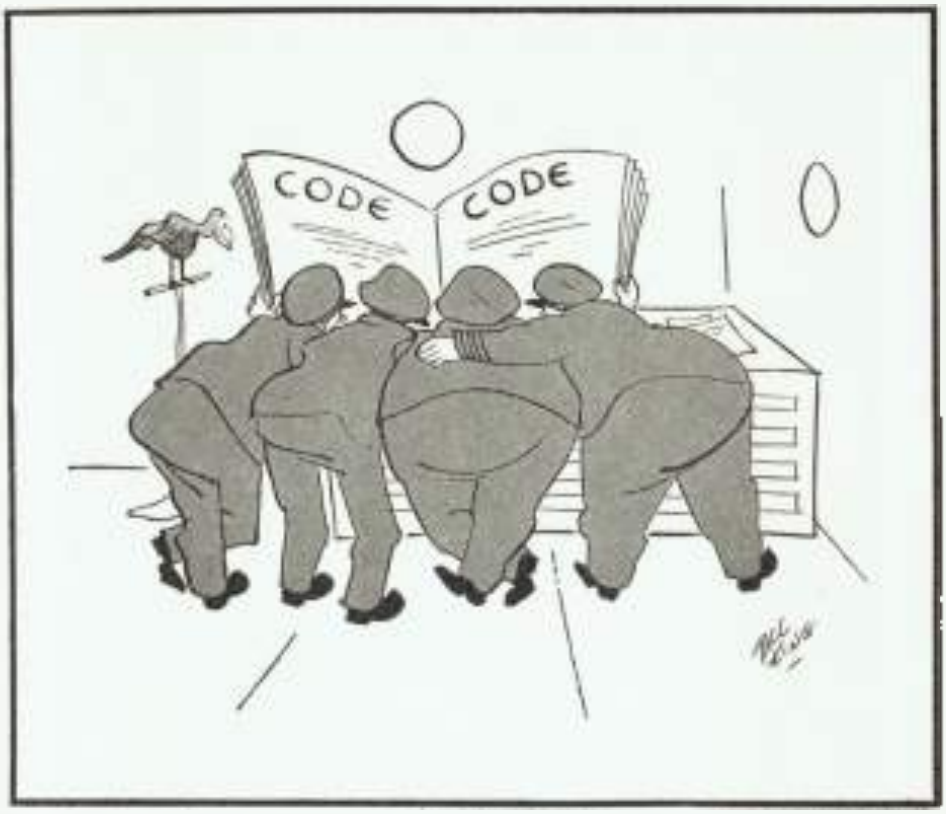
(b) This paragraph, besides laying down that security for the Radar installation is the responsibility of the Master, also requires that a guard shall be placed on the Radar Office while the ship is in port.

(c) D.E.M.S. and U.S. Navy Armed Guard Officers have been informed, and Masters should note, that:

(1) The office is to be kept locked when not in use;

(2) If there is difficulty in maintaining a continuous guard from ships service personnel when in harbor, Masters should apply to the Naval Authorities, for men to act as sentries.

CHAPTER 4



CODING AND DECODING.

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Responsibility

ARTICLE 28

(a) The Master of the ship will be furnished by the Naval Authorities with all necessary codes and confidential publications. He is held responsible for them and must insure that all instructions regarding the maintenance of security are observed.

Use of Codes

ARTICLE 29

(a) Unless otherwise ordered, all messages sent by radio are to be coded in "WIMS" Vol. 2, and recoded in the appropriate recoding table. Full instructions on when and how to use all recoding tables are given in Chapter I "WIMS" Vol. 2.

(b) Exceptions to the foregoing are Distress Messages and messages of Extreme Urgency, when, in the opinion of the Master, there is not time to code the message.

(c) The use of private ship or shipping company codes is prohibited.

Coding and Decoding Staff

ARTICLE 30

(a) Some of the ship's personnel should be trained in coding and decoding methods, so that staff are always available for handling messages without delay. In most British managed ships the Radio Officer will be the most suited to undertake this work

(b) The importance of clear writing and accuracy in coding work is stressed. Before transmission of a message, when time permits, the accuracy of the coding should be checked by decoding the message. When this delay cannot be accepted, however, the check should be carried out as soon as possible after transmission, in order that any mistake may be corrected with the minimum of delay.

(c) Coded messages received are to be decoded as soon as possible after reception. When part of a message is missed or mutilated, the part received should be decoded and clearly marked to show that the message is incomplete. Messages are to be delivered to the Master as soon as decoded.

(d) Should it be found impossible to decode a message addressed to the ship or to a Collective Call Sign which includes the ship, a report is to be made to the Master who should determine whether or not radio silence is to be broken to request a repetition (*see* Article 1321). An immediate check can sometimes be made by visual signaling (when in convoy or if other ships are in sight). The Naval Authorities are to be advised by the Master immediately on arrival in harbor of any messages received during the voyage that could not be decoded.

CHAPTER 4

CODING AND DECODING

ARTICLE 31

Custody of Codes and Messages

(a) Code books and recoding tables are to be kept in the custody of the Coding Staff when the ship is at sea, and under strong lock and key when not actually in use.

(b) Coded and decoded versions of messages are never to be kept together. Plain language versions of coded ~~or ciphered~~ messages are to be destroyed by burning or other positive means after they have served their purpose. Coded versions of messages are to be retained and kept in the Master's safe for a period of six months, after which they are to be destroyed by burning on the orders of the Master.

(c) All rough workings of codes and decodes and any scrap paper used in the coding and decoding of messages are to be destroyed by fire.

(d) When the ship is in harbor, *all* copies of messages retained on board are to be kept locked up in a safe place.

(e) When the ship enters a port, code books, recoding tables and all other confidential publications used by the Coding Staff are to be returned to the Master.

ARTICLE 32

Destruction of Codes and Messages

(a) In an emergency when it becomes necessary to dispose of confidential documents in the possession of the Coding Staff, code books, recoding tables and all copies of messages are to be destroyed by burning if time permits, otherwise by throwing overboard in deep water in the metal box or weighted bags provided.

CHAPTER 5

"Battery Boxes are sometimes fitted in places not easy of access."

MAINTENANCE OF APPARATUS.

Inspection and Maintenance of Transmitters

ARTICLE 36

(a) When at sea, the main and emergency transmitters must be ready for immediate use, and must always be kept adjusted accurately to the distress frequency (500 kcs). When fitted, the H/F transmitter should be adjusted periodically to the frequency best suited to the area and the time of day. (See Frequency Guides M.350 and IRPL–M series.)

(b) In time of war a ship's transmitter may not be used over a long period, and a thorough inspection of the entire installation is to be carried out daily. Special attention should be paid to battery and aerial connections, and to any other parts of the installation which are particularly susceptible to vibration or rough weather.

(c) Any precipitation of moisture on a ship's transmitter may have an adverse effect upon its performance. When separate heating lamps are provided for drying out, these should be switched on for half an hour every twelve hours for this purpose, and the transmitter should be "run-up" once a day for two minutes to insure that it is actually functioning. Every precaution should be taken to prevent accidental transmission while the machine is running.

(d) H/F transmitters should be tuned accurately to the H/F ship-shore frequencies given in Appendix F. Wireless Telegraphy Surveyors in the United Kingdom and Naval Authorities elsewhere should be requested to check the tuning of the transmitter if there is any doubt as to its accuracy.

(e) Vessels calling at Canadian ports are not to test radio and R/T transmitters. Such tests will be carried out by N.C.S.O.'s during ship's stay in harbor.

M/F D/F Calibration

ARTICLE 37

(a) The importance of correct calibration of M/F D/F sets is emphasized. The calibration of D/F equipment is particularly liable to be affected by any alterations to rigging (e.g., altering the position of the triatic stay), by alterations to gun fittings, or when defensive balloons or kites are flown. Heavy deck cargos also necessitate frequent recalibration.

(b) A number of ports can now offer facilities to merchant ships for the calibration of M/F D/F sets, and Masters should make application in accordance with the special instructions given in Appendix E.

(c) Special arrangements can sometimes be made at other ports for the provision of a transmitting vessel, with the help of which an adequate calibration can be carried out if the Radio Officer has the necessary experience.

(d) In addition to taking full advantage of these calibration facilities, every opportunity should be taken to check D/F equipment by taking bearings in clear weather, when the ship's position can be fixed by visual means, e.g., bearings of Barra Head radio beacon could be obtained without "land effect" from positions off the North Coast of Ireland.

CHAPTER 5 APPARATUS

ARTICLE 38 Maintenance of Accumulator (Storage) Batteries

(a) Accumulator (storage) batteries must be kept fully charged and in good condition.

(b) A record of all batteries should be maintained (in the form provided in the Official British Radio Log where carried.

(c) Battery boxes are sometimes fitted in places not easy of access, but regular inspection as a routine matter must be arranged. All leads and connections must be firmly secured, and a little slack allowed in the leads to reduce the risk of a disconnection through movement or vibration.

ARTICLE 39 Maintenance of Portable Lifeboat Batteries (Dry-Acid Type)

(a) The maintenance of batteries of the dry-acid type requires special care, particularly as regards the periodical addition of distilled water before and during charge.

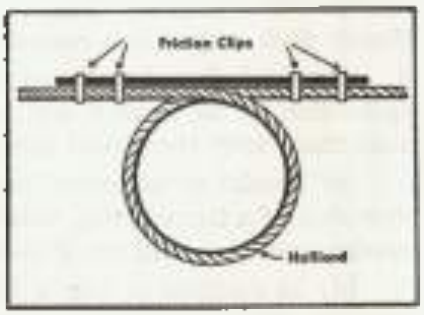
(b) For the detailed treatment of batteries of the dry-acid type in British-managed merchant ships, reference should be made to the Ministry of War Transport's Notices on "Lifeboat Wireless Equipment." M.202, etc.

ARTICLE 40 Aerials

(a) *Protection of main aerial*- In many cases, where ships have been struck by mine or torpedo, the main aerial has been carried away by the mastheads whipping and breaking either the aerial span or the halyards. Some protection against this is afforded by the following precautions:

(1) The aerial should be slacked slightly but not so as to cause any undue sway or sag.

(2) The halyards, instead of being secured near the bases of the masts, should be moved away as far as possible so as to allow them to run through the masthead blocks. The position of the halyards should not, however, be such as to interfere with the working of the ship and in particular with the defensive armament.



(3) A short length of wire, having a lower breaking strain than either the aerial or halyard wires, should be inserted by shackling into each halyard wire between the masthead and the aerial insulator. A second wire having a greater breaking strain than aerial or halyard wires, and at least three times the length of the first wire, is then joined to the same shackles, as indicated on page 24.

(b) Other systems which have proved satisfactory in practice may be used, e.g., the making of a loop about 1 foot in diameter in each halyard between the masthead and the aerial insulator. This loop is secured by a short length of wire having a lower breaking strain than either halyard or aerial wires. The "weak link" may be either of wire of a smaller gauge than the aerial or halyard wires, or of the same wire as the aerial with three of the seven strands removed. When rope halyards are used the "weak link" must be of smaller rope than that used for the halyard. Breakage of the "weak links" may cause the aerial to sag so as to touch some earthed/grounded object, but this can be corrected by hauling on one or both of the halyards. In order to avoid strain on the feeder, a small amount of slack should, where possible, be allowed when fitting. The strain rod insulator should only be secured to the ship's structure by a light lacing to insure that this will give way first in the event of a sudden excessive strain coming on the feeder.

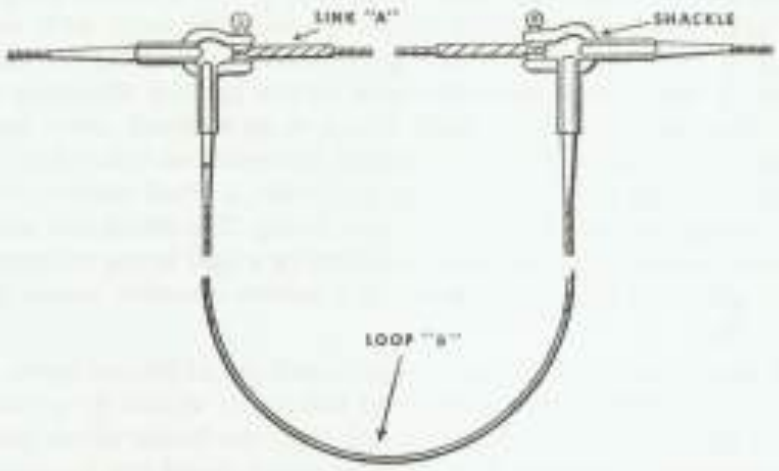
(c) Both main and emergency aerials and the additional spare aerial, including the junction of the feeder to the aerial, should be periodically inspected for weak points, especially just abaft the funnel where the gases are liable to cause corrosion. The aerial insulators should also be wiped over when opportunity arises, e.g., when the aerial is lowered.

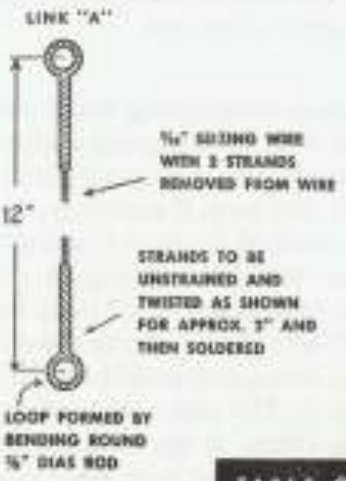
(d) *Emergency aerial:*

(1) British Managed Ships. All ships compulsorily fitted with radio telegraphy apparatus are to be fitted with an emergency aerial erected in a different plane from the main aerial. The emergency aerial should be erected independent of the masts, but may, if necessary, be guyed low down on the masts. Use may be made of the funnel, samson posts, derricks or other suitable attachment. When the ship is at sea, each aerial must be capable of immediate attachment to the main transmitter by means of a link or switch. Where the emergency transmitter is a separate instrument, the main and emergency aerials should also be capable of immediate attachment to it. The necessary loading coil or coils must be fitted inside the Radio Office. A spare length of aerial wire must also be carried for use in the event of both main and emergency aerials being destroyed. Wire for emergency aerials should be of sufficiently heavy gauge to withstand the strain likely to come on it. Special attention is called to the recommendation concerning the provision of protective loops in the main aerial and to the requirement that the emergency aerial must be erected in a different plane from the main aerial, as instances have occurred in which the main aerial has been brought down and has fallen across and short circuited the emergency aerial.

(2) U. S. Managed Ships: At all times while the ship is navigated in the open sea a reliable emergency aerial shall be available for immediate

AERIAL WEAK LINK





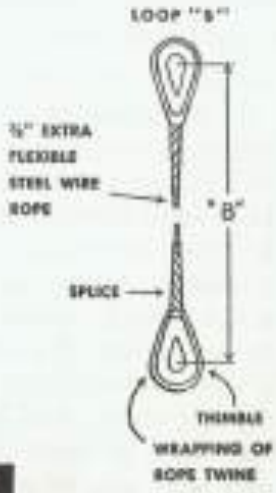


TABLE OF LENGTHS	
LENGTH OF SPAN APPROX. IN FEET	LENGTH "B"
250	3'-6"
200	3'-0"
150	2'-6"
100 OR LESS	2'-0"

connection to the required main and/or emergency transmitter(s). This emergency aerial shall be supported at the greatest practicable height by means independent of the masts which support the main aerial, and shall be capable of providing effective operation of the station on the frequency 500 kilocycles.

(e) *Spare aerial:* A spare length of aerial wire, insulators and shackles must be carried in order that a temporary aerial may be rigged without delay in the event of both main and emergency aerials being put out of action.

Portable Lifeboat Equipment

ARTICLE 41

(a) Radio Officers and Communications personnel of United Nations Merchant Ships equipped with portable lifeboats equipment are referred to Appendix J which contains detailed information on the use, operation and upkeep of this equipment.

(b) Under Statutory Rules and Orders (see Appendix I), this special wartime radio equipment is required to be carried on British ships by the Admiralty and Ministry of War Transport.

Closure of Radio Stations on Merchant Ships

ARTICLE 42

(a) In some Allied and Neutral ports, radio transmitting equipment may be sealed by local authorities. While in port these seals must not be broken without the approval of the local authorities, but on standing out to sea the seals should be broken and the transmitters made ready for immediate use.

(b) In United States ports transmitting equipment will not be sealed. For details regarding use, control, and sealing of radio equipment in U.S. and British ports see Appendices H and I.

Reporting Defects

ARTICLE 43

(a) Any defect in any part of the radio installation which cannot be properly and permanently repaired by the ship's staff, must be reported in writing to the appropriate authorities immediately the ship reaches port. A suitable entry must also be made in the *radio log*.

(b) On completion of a voyage, and before signing off "Articles," the Senior Radio Officer is responsible for notifying the appropriate authorities of all defects which have occurred during the voyage, and for pointing out any weakness which is likely to give trouble if not remedied.

CHAPTER 5

APPARATUS

ARTICLE 44 Reports on Radio Equipment

(a) The details of radio equipment required on Form S1540 (supplied to British managed merchant ships) enable the Naval Authorities at convoy assembly bases to check that the radio equipment conforms with Admiralty requirements, that any defects in the radio equipment reported on arrival are properly repaired before the ship is again due to sail, and that the most suitable ships are selected for radio guard duties. The Master should therefore insure that this form is correctly filled in and handed to the Naval Authorities when he reports the ship's arrival.

(b) Information concerning radio equipment aboard U.S. managed merchant ships is to be furnished Naval Authorities by the Master.

ARTICLE 45 The Official Radio Log

(a) A *radio log* must be kept for each voyage.

(b) Every ship sailing independently or in convoy shall keep an accurate log for each voyage as follows:

British Managed Ships

(a) Full instructions for keeping the radio log, its disposition, and disposal in an emergency are contained in the directions issued with the log supplied by the Naval Authorities to the Master.

U.S. Managed Ships

Contents:

(a) Each sheet of the log shall be dated and numbered in sequence for each voyage and shall show the international call letters of the ship station, the name of the commercial radio company licensee, and the name of the operator on watch.

(b) The entry "on watch" shall be made by the operator beginning a watch, followed by his signature. The entry "off watch" shall be made by the operator being relieved or terminating a watch, followed by his signature. All log entries shall be currently completed at the end of each watch by the operator responsible for the entries. The use of initials or signs is not authorized in lieu of the operator's signature. Logs shall be written in ink or on a typewriter. Items considered to be of particular interest to the Navy shall be underlined in red.

(c) While on watch, the operator shall make the following entries in the log:

(1) Complete traffic lists of all BAMS schedules received from the Zone and Area stations.

(2) The date time group of any BAMS messages heard on 500 kcs, the call letters of the transmitting station, and the call letters of the station addressed.

(3) The date time group of any messages sent from the ship, the station called, and the frequencies used.

(4) A positive entry each half hour as to whether the silent period is maintained.

(5) Remarks as to excessive interference, caused by atmospherics, deliberate jamming, etc., stating the source, if known.

(6) The date time groups and full texts of all distress messages, automatic alarm signals, and any incidents which are important to the safety of the ship or to shipping in general including suspicious signals heard or transmitted.

(7) Any use of the auto-alarm.

(8) Remarks as to the daily inspection of equipment.

(9) Any break-down of equipment and the repairs effected.

(10) Any failure of the power supply.

(11) A daily entry regarding comparison of the Radio Office clock with standard time, including an indication of any errors observed and corrections made. Authentic time signals received from land stations shall be acceptable as standard time.

Information Not to Be Placed in the Radio Log

During wartime, it is imperative that certain information be *excluded* from the radio log, such as:

(a) The war radio call sign of the ship, except where it appears in BAMS traffic lists broadcast from Zone and Area stations. Where the war radio call sign call of the ship appears in all other cases, the international call shall be substituted therefore when making entry in the log in order to prevent any compromise of the war radio call sign call.

(b) Plain language versions of coded messages received by the ship.

(c) Positions of the ship or of any other United Nations ships (except in the case of distress messages sent or received).

(d) Information concerning disposition of United Nations Merchant Ships or Naval vessels.

(e) Confidential information furnished the ship by Naval Authorities such as convoy call signs, sailing signals, etc.

(f) Port of departure, way ports, or destination.

Inspection of Log

(a) The log is to be inspected daily and signed by the Officer in Charge of Radio Communications.

(b) The log is to be submitted daily to the Master for his signature, and his attention must be drawn to any entries of importance or interest. A certification shall be made by the Master at the end of each day stating "I have received all appropriate traffic."

Disposition of Log

(a) The radio log for the voyage is to be handed over to the U.S. Routing Officer by the Master at the final port of discharge in the continental United States.

(b) Naval Authorities will inspect the log and will forward it, if the log is in proper form, to the nearest established shore office of the ship station licensee for filing.

Message File

(a) A file shall be maintained in the Master's safe containing all messages transmitted and all coded messages received by the ship. Messages shall be maintained in this file for a period of six months. At the end of this period, the Master shall destroy this file by burning.

(b) Plain language copies of encrypted messages shall be destroyed by burning after they have served their purpose.

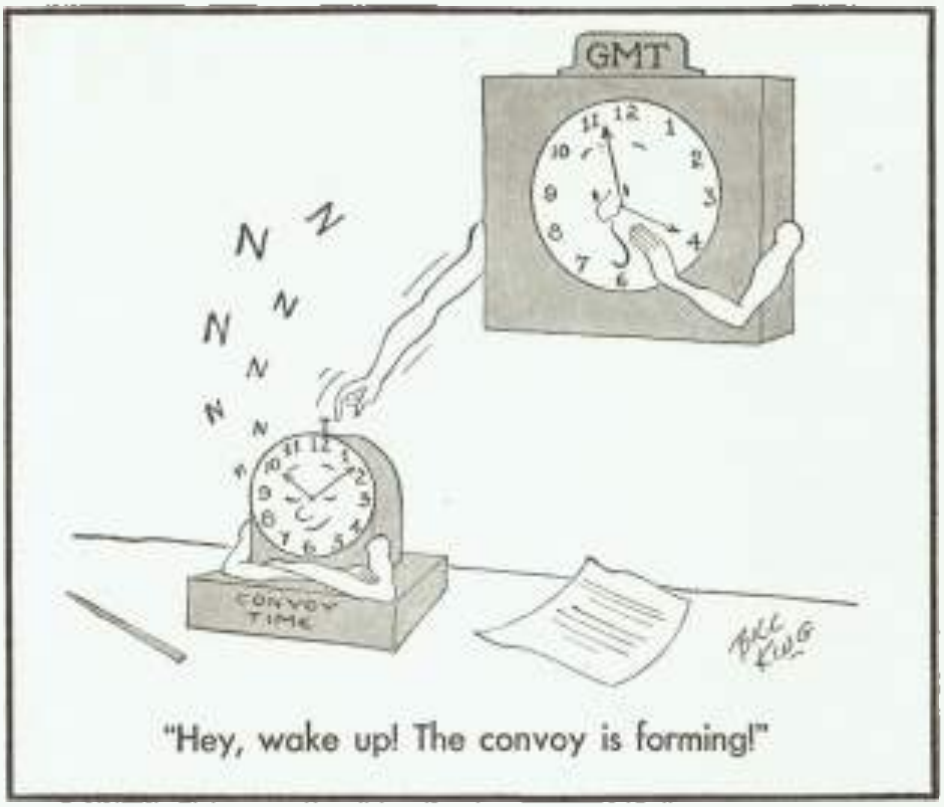
ARTICLE 46

Nomenclature of Frequencies

(a) The following frequencies are used for transmissions to and from merchant ships:

FREQUENCY	SHORT TITLE	RANGE
Very low frequency	VL/F	Below 30 kcs
Low frequency	L/F	From 30–300 kcs
Medium frequency	M/F	From 300–3000 kcs
High frequency	H/F	From 3000–30000 kcs
Very high frequency	VH/F	From 30000–300000 kcs

CHAPTER 6



"Hey, wake up! The convoy is forming!"

TIME USED IN RADIO.

Times to be Used in Messages Transmitted by Radio

ARTICLE 48

(a) Times in the text of messages transmitted by radio to or by a merchant ship are to be expressed in Greenwich Mean (Civil) Time. All times (except reference to Times of Origin of previous messages) are to be expressed as four-figure groups, followed by the letter suffix "Z" in each case to indicate Greenwich Mean (Civil) Time, and where necessary, the date and the Month.

Example: Your 141345Z. My position at *1200Z 15th* March is 45° 17' N. 20° 32' W. (Time of Origin uncoded) 151210Z.

(b) The only exception to the above rule is that in any message transmitted in convoy, on low power for the information of the Convoy, Commodore, and/or Escort only, *Convoy Time* should be used and the letter suffix "Z" omitted. *Convoy Time* is the time ordered by the Commodore to be kept by ships for the purposes of daily life and routine on board.

The Time of Origin of a Message

ARTICLE 49

(a) Messages in time of war are not normally given serial numbers or letters but are identified by their Time of Origin (but see Article ~~48(d)~~).

(b) The Time of Origin of a message is time at which it was authorized by the originator.

(c) The Time of Origin is to be expressed in Greenwich Mean (Civil) Time (except as in paragraph (d) below) and is to be denoted by a six-figure group followed by the letter suffix "Z". The first pair of digits will denote the date, the second pair the hours, and the third pair the minutes. The letter "Z" will indicate Greenwich Mean (Civil) Time. e.g., 071714Z denoted 1714 GMT on the 7th.

(d) The Time of Origin of messages transmitted by a ship in convoy, for the information of the Convoy, Commodore and/or Escort only, should be expressed in *Convoy Time* instead of GMT and the letter suffix "Z" omitted.

(e) The Time of Origin of a message must not be coded. This group should form the last group of a message and should be separated from the text by a *break* sign.

(f) When the Time of Origin of a message is quoted in the text of a coded message for purposes of identification, it should be treated like any other word or group in the text and must be coded except the suffix "Z" should be omitted from the coded version. The month and/or year may be added if necessary.

Example: The following message is to be sent in code:

Your 081235 March. Necessary action will be taken (Time of Origin uncoded) 140942Z.

The group 081235 March, being an integral part of the text, must be treated like any other word and must therefore be coded. The group 140942Z is the actual Time of Origin of the message being coded, it does not form part of the text (being separated from it by the break sign) and must not be coded.

(g) When calculating the number of groups in a coded message, the uncoded Time of Origin is not to be counted as a group.

(h) Abbreviated numerals must *not* be used when signalling by radio in time of war.

ARTICLE 50

Radio Office Clock

The Radio Office Clock should always be kept set accurately to Greenwich Mean (Civil) Time.

CHAPTER 7

"Personal Call Signs."

RADIO CALL SIGNS.

General

ARTICLE 53

(a) Radio call signs used in time of war are of three types, namely:

(1) Collective, (2) General, (3) Individual

Collective Call Signs

ARTICLE 54

(a) *Collective Call Signs* are used to address a number of ships simultaneously.

(b) The following Collective Call Signs are in force:

CALL SIGN	MEANING
UNWS	Any or all United Nations Warship(s)
NERK	Any or all United States Naval Ship(s)
GBXZ	Any British Warship(s)
ZONE CALL SIGN—i.e. BAMS	All United Nations Merchant Ships
AREA CALL SIGN—i.e. BAMS 2A	All United Nations Merchant Ships in any one particular BAMS Area
CONVOY COLLECTIVE RADIO CALL SIGN—i.e. XYD3	All ships in a convoy or in a particular section of a convoy (see Article 58)

General Call Signs

ARTICLE 55

(a) The following block of nine call signs has been allocated for use by merchant ships *sailing out of convoy* as General Radio Call signs:

NUMS 1	NUMS 4	NUMS 7
NUMS 2	NUMS 5	NUMS 8
NUMS 3	NUMS 6	NUMS 9

(b) With all coded messages transmitted by radio by a merchant ship out of convoy, a *General Radio Call Sign* must be used as follows:

(1) Any one *General Radio Call Sign*, e.g., NUMS 7, is to be selected at random and used as the ship's radio call sign to indicate that the originator of the message is a United Nations merchant ship.

(2) To identify the particular merchant ship using this General Radio Call Sign, the *War Radio Call Sign* of the transmitting ship is to be coded up at the beginning of the text of the message. Should a ship not hold a War Radio Call Sign, the name of the ship is to be coded at the beginning of the text.

(3) The same *General Radio Call Sign* used initially by a ship is to be retained, when communication with a shore radio station is established, until the particular traffic is cleared. On the next and each separate occasion of breaking radio silence, a different *General Radio Call Sign* is to be chosen.

Note: The General Radio Call Sign is *never used to address* any or all United Nations' merchant ships.

ARTICLE 56 Individual Call Signs

(a) Every merchant ship carries the following Individual Radio Call Signs:

(1) **International Call Sign**

(i) Used when working a neutral shore station (see Article 146, paragraph (e)).

(ii) Used by commercial vessels for transmission of messages relating to navigation and business of the ship when operating within the Inland Waters of the United States.

(2) **War Radio Call Sign,** allocated to her by the Naval Authorities and *not to be divulged*. Only Naval Authorities ashore and afloat have access to a merchant ship's War Radio Call Sign. No merchant ship is informed of any War Radio Call Sign except her own.

(3) **Convoy Individual Radio Call Signs,** held by merchant ships when sailing in convoy. Full details are given in Article 58. These call signs are intended primarily for intra-convoy communication.

ARTICLE 57

Use of Call Signs

(a) The particular call sign to be used *by* merchant ships when transmitting messages by radio varies in accordance with the *type of message* as follows:

TYPE OF MESSAGE	CALL SIGN
All messages when in convoy	CONVOY
All coded messages when out of convoy	GENERAL
All messages in plain language when out of convoy (except when passed through a neutral radio station or transmitted in accordance with Article 56 (a)(1)(ii) above)	WAR
All messages passed through a neutral radio station, or for transmission of messages relating to navigation and business of the ship when operating within inland waters of the United States. (Note: All such messages must be in plain language.)	INTERNATIONAL

ARTICLE 58

Convoy Call Signs

(a) Convoy radio call signs and Convoy radiotelephone call signs are based on the two-letter or figure–letter convoy radio distinguishing group, which is allocated to each convoy before sailing, using suffixes as follows:

1	2	3
SHIPS OR AUTHORITIES	R/T SUFFIX	RADIO SUFFIX
COMMODORE	CHIEF	D1
VICE COMMODORE	LUCK	D2
WHOLE CONVOY	TEAM	D3
COMMODORE SECTION	—	D4
VICE-COMMODORE'S SECTION	—	D5
S.O. OF ESCORT	BOSS	D6
ESCORT VESSELS COLLECTIVE	GANG	D7
INDIVIDUAL ESCORT AND SUPPORT VESSEL (BRITISH)	FLEET NUMBER PRECEDED BY BIT	—
INDIVIDUAL ESCORT AND SUPPORT VESSEL (US)	LAST DIGIT OF HULL NUMBER PRECEDED BY BUG	—
S.O. OF SUPPORT GROUP	FOREMAN	D8
STRAGGLERS FROM CONVOY	—	D9
SUPPORT GROUP COLLECTIVE	MOB	D10
INDIVIDUAL SHIPS IN CONVOY	D PLUS PENNANT NUMBER	D PLUS PENNANT NUMBER

CALL SIGNS

1	2	3
SHIPS OR AUTHORITIES	R/T SUFFIX	RADIO SUFFIX
ESCORT CARRIER NO. 1	NEST	DIA
ESCORT CARRIER NO. 2	COTE	DIB
ESCORT CARRIER NO. 3	BOK	DIC
ESCORT CARRIER NO. 4	SACK	DID
RESCUE SHIPS COLLECTIVE	STRETCHERS	DIF
RESCUE SHIPS INDIVIDUAL	STRETCHERS (1, 2, ETC.)	D PLUS PENNANT NUMBER
H/F D/F SHIP COLLECTIVE	DUFFER	DIG
H/F D/F SHIP INDIVIDUAL	DUFFER (1, 2, ETC.)	D PLUS PENNANT NUMBER
M/F D/F SHIP COLLECTIVE	METER	DIJ
M/F D/F SHIP INDIVIDUAL	METER (1, 2, ETC.)	D PLUS PENNANT NUMBER
MAC SHIP COLLECTIVE	HAWKER	DIK
MAC SHIP INDIVIDUAL	HAWKER (1, 2, ETC.)	D PLUS PENNANT NUMBER
SHIP IN OR NEAR THE VAN	VAN	DIL
SHIP IN OR NEAR CENTER	MID	DIM
SHIP IN OR NEAR THE REAR	REAR	DIN
A/A CRUISER	CRACKER	DIP
SHIP CONTROLLING A/C	EAGLE	DIQ
RADIO GUARD ON HOMING WAVE	—	CONVOY RADIO DISTINGUISHING GROUP. (In the case of a section of a convoy separating as the first call sign, the section suffix is to be added.)
SPARE	—	DIR
SPARE	—	DIU

(b) When used by R/T, convoy radio distinguishing groups shall be spoken phonetically.

(c) Where a suffix has not been provided in column 2 of the above table the suffix appearing in column 3 will be used for R/T communications and spoken phonetically.

(d) The convoy suffix letter D is invariably assigned to the main body of the convoy. The convoy suffix letters E, H, I, K, O, Q, S, T and X are reserved for allocations to sections joining or breaking off from the main body of the convoy.

(e) Call signs of individual ships of convoy sections are to include the appropriate suffix letter allocated to that section.

(f) Special call signs of rescue, H/F and M/F D/F ships are only to be used when passing messages connected with the performance of their special duties. At other times individual ship call signs are to be used.

(g) In British convoys when no U. S. Naval escort or support vessels are present, individual R/T call signs for escort and support vessels present will be taken from the British Naval call sign book rather than the above table.

CHAPTER 8

"BAMS provides a means of passing messages to merchant ships with a minimum of delay."

BAMS—BROADCASTS FOR ALLIED MERCHANT SHIPS.

PAGE 40 ORIGINAL

Organization

ARTICLE 60

(a) The organization for broadcasting messages and orders by radio to Allied merchant ships at sea is known as the "BAMS" organization. The principles on which this organization is based are:

(1) To provide a means of passing messages to merchant ships at sea with the minimum of delay.

(2) To provide a regular and adequate service of broadcasting to merchant ships by radio in every part of the world.

(3) To limit the number of stations broadcasting at any one time in any part of the world thereby making it unnecessary for Radio Officers to guard an excessive number of routines.

(4) To permit ships to keep watch on 500 kcs (600 meters) for the maximum time.

(b) In the BAMS organization the world is divided into Zones and Areas. Each Area is identified by a number, some Areas being further divided into Sub-Areas, which are identified by a letter suffix added to the Area number (see Appendix A, Diagram A).

(c) Each individual Area and Sub-Area is normally covered by two (and in a few cases three) high or medium powered stations which broadcast at fixed times on low and/or high frequency; and also by a number of medium-powered stations which keep continuous watch on 500 kcs, and/or may broadcast at any time. These different stations are called:

(1) **Zone stations:** High powered stations which broadcast at routine times and cover several Areas and Sub-Areas simultaneously.

(2) **Area stations:** Medium powered stations which broadcast at routine times, but cover only one particular Area or Sub-Area.

(3) **Coastal stations:** Medium powered stations which broadcast at any time, to any ship or ships judged to be within their range.

(d) In addition, ship to shore H/F communication is available through certain shore radio stations which keep watch on the frequencies and at the times shown in Appendix F.

Ship to Shore H/F Communication

ARTICLE 61

(a) In order that ships may select the best frequency to use for high frequency transmissions to United Nations' shore radio stations, reference should be made to Frequency Guides M. 350 and IRPL-M. Each issue of these guides is effective for a three months period. The effective frequency guides shall always be inserted in the last part of WIMS 3. Masters are authorized to remove obsolete frequency guides and destroy them by burning. No accounting or submission of report of destruction is necessary.

(b) Any of the stations, listed in Appendix F or in Frequency Guide M. 350, which hear a call on high frequency from a merchant ship may answer and accept a message and will then be responsible for passing it on to the addressee. Ships should call the station with which they wish to communicate but should pass their message to whichever station they hear answer.

(c) Shore radio stations normally use the calling frequency when answering.

(d) Messages are always to be broadcast by a ship if no shore station is heard to reply after reasonable calling. Subsequently, however, the ship should endeavor to obtain an acknowledgement that the message has been received.

Operation of British Stations

(e) British stations keep watch on 4740, 6300, 8290, 12,685 and 16,845 kcs as shown in frequency guide M. 350. In addition, traffic on Rugby (GBR) on 16 kcs will be interrupted to answer merchant ships calling on H,F who do not appear to have heard shore stations answering on the calling frequency. If the ship hears no reply to her call within five minutes the following procedure is to be adopted:

(1) Broadcast the signal, completing the message with "QSX-GBR".

(2) Listen on 16 kcs for Rugby (GBR) for fifteen minutes, but maintain uninterrupted watch on 500 kcs throughout.

(3) Indicate the wave frequency (ies) on which the ship is listening, e.g., "QSX-GBR" or "QSX-GBR and 12,685 kcs". If no such indication is given, it will be assumed that the ship is listening only on the calling frequency.

Operation of U. S. Stations

(f) U. S. stations keep continuous listening watch on 4140, 8280, 12,420 and 16,560 kcs as shown in Appendix F. They answer calls and work on these frequencies.

Operation of Pacific Stations

(g) Merchant ships in the Pacific, if unable to establish communication on H,F with the appropriate stations shown in frequency guide M. 350 or in Appendix F, may pass messages through the Naval Radio Stations given in Table 3, using the call signs NQO (any or all U. S. Naval Shore Radio Stations) and VHK* (any Australian Shore Radio Station) as applicable, to establish communication. The stations keep listening watch on 4235, 8470, 12,705, and 16,940 kcs at the times indicated in the table and will answer on the calling frequency, using their own call signs.

ARTICLE 62 Operation of Coastal Stations

(a) Coastal stations maintain watch on 500 kcs and/or are available for the transmission of *BAMS* messages. (See Appendix A.)

(b) Coastal stations broadcast at any time and have no fixed routine transmissions. For this reason it is essential that ships should keep watch on 500 kcs up to the maximum hours consistent with the number of Radio Officers on board.

(c) Each Coastal station is in close touch with the Local Naval Authorities, and all messages received or intercepted from ships at sea are immediately passed to these authorities.

Traffic from Ship to Shore

(d) If the Master of a ship decides to break radio silence in order to pass a message to the shore authorities (see Article 130) the appropriate station may be called on 500 kcs or on H/F. Except in the case of Distress Messages, H/F should always be used when practicable. The station will answer the call, and the message will then be passed.

(e) An exception to the foregoing occurs when a merchant ship out of convoy is in distress, and broadcasts a Distress Message (of any type) on 500 kcs. In this case no station is actually called, but as soon as the transmission has been completed an adjacent Coastal station will rebroadcast the message on 500 kcs. This rebroadcast is for the benefit of all ships in the locality who may not have heard the original transmission from the ship in distress and at the same time assures this ship that her message has been received. The ship herself should listen attentively to this rebroadcast in order to verify its accuracy. (see Article 146 (b).)

(f) Coastal Stations do not rebroadcast messages from ships in convoy. The interception is reported with bearings to the appropriate Naval Authorities.

Traffic from Shore to Ship

(g) When a Coastal station has a message for a ship or ships in its area of operation it will send out the appropriate call on 500 kcs, and, unless it is going to transmit the message on 500 kcs, will follow the call with an instruction to shift to the working wave frequency of the station by the use of the signal "QSW". After a brief interval the message will be broadcast twice through, on the working wave frequency. *In all cases the ship or ships called must maintain radio silence throughout.*

(h) Messages broadcast by a Coastal Station will be transmitted on receipt and repeated at the next available special single or two-operator period (see Appendix B) as appropriate, according to the number of radio operators on board the ships addressed.

Operation of Zone and Area Stations

ARTICLE 63

(a) Zone and Area stations broadcast at routine times (on very low, low, medium, and high frequencies simultaneously) general and individually

addressed messages for ships in their own Zone or Area respectively. (See Appendix A.) Messages for ships with only one radio officer will be transmitted on routines that fall within the Special Single-Operator Periods for the area(s) through which the ships are passing, for the number of transmissions specified by the originator.

ARTICLE 64 BAMS Routines—The Traffic List and Order of Broadcasting Traffic

(a) At their routine periods Zone and Area stations will commence by broadcasting the Times of Origin of all messages awaiting transmission, preceded by the call signs (made twice), to ships that are addressed, in the sequence in which messages will be broadcast. This is called the *Traffic List*. Should a Zone or Area Station have no traffic to transmit at a routine period, the station will broadcast the signal "QRU."

(b) Messages will be included in the Traffic List in the following sequence:

(1) *New Traffic*, consisting of messages which have not been transmitted on a previous routine.

Messages will be transmitted in the order of precedence assigned by the originators. (See subparagraph (g) below for table of precedence indicators.) If two or more new messages are broadcast in any precedence category, these messages will be transmitted in the same sequence as their Times of Origin, the message with the earliest Time of Origin being transmitted first.

(2) *Old Traffic*, consisting of messages which have been transmitted on a previous BAMS routine in the following sequence:

Messages addressed to Collective Call Signs (see Article 54):

The Zone Call Sign*, e.g., BAMS.

The Area Call Sign, e.g., BAMS2A.

Convoy Collective Radio Call Signs (in alphabetical sequence), e.g., XYD3.

Messages addressed to Individual War Radio Call Signs (see Article 56) and Convoy Individual Call Signs (see Article 72) in alphabetical sequence.

(c) Traffic will then be broadcast, with messages following one another in the sequence indicated in the Traffic List, each message being preceded by its appropriate call sign, made twice, and the number of groups or words contained in the message. Each message will be made once through. On

completion of the transmission of all messages indicated in the Traffic List new messages will be repeated in the same sequence as they were broadcast at the first transmission.

(d) Zone Stations may broadcast messages addressed to two or more Areas. Except at the first time of transmission, when messages will be broadcast in order of precedence, the order of transmission will be determined by the lowest numbered Area concerned—i.e., a message for Areas 3C and 7B would be broadcast immediately after any messages addressed to Area 3C alone; or, if there were none of these, after any messages addressed to the next lower Area for which traffic was on hand, such as Areas 3A or 1B.

(e) *Example: Simonstown (ZSC) has the following five messages for transmission at a routine period:*

Messages one and two are for all ships in Area 3E, timed 060654Z and 061720Z respectively.

Message three is for stragglers from a convoy, call sign XYD9—061942Z.

Message four is for an individual ship, call sign GB5KP—051843Z.

Message five is addressed by two individual call signs, ZG5OX and Z15CG—061012Z.

Note: Messages 061720Z, 061942Z, 061012Z are new traffic; the first is PRIORITY (IMPORTANT), the second is ROUTINE, the third is DEFERRED; messages 060654Z and 051843Z have been broadcast in a previous routine.

Simonstown broadcasts the **Traffic List** *as follows:*

CT BAMS 3B BAMS 3B BAMS 3B DE ZSC BT QTC BT	
BAMS 3B BAMS 3B	061720Z
XYD9 XYD9	061942Z
ZG5OX ZG5OX Z15CG Z15CG	061012Z
BAMS 3B BAMS 3B	060654Z
GB5KP GB5KP	051843Z

AR

Traffic *is then broadcast in the order indicated;* messages timed 061720Z, 061942Z and 061012Z are repeated after all traffic appearing in the Traffic List has been broadcast.

(f) Coded messages are transmitted by radio to merchant ships in the following form:

$\overline{\text{CT}}$ BAMS 3B BAMS 3B $\overline{\text{BT}}$ IMPORTANT FROM ADMIRALTY $\overline{\text{BT}}$ CDE6 $\overline{\text{BT}}$ BSTK LAMN 12345 67890 09876 54321 $\overline{\text{BT}}$ 061720Z $\overline{\text{AR}}$

(g) Naval authorities will employ the following precedence indicators:

U. S.	*BRITISH*
URGENT	MOST IMMEDIATE
OPERATIONAL PRIORITY	IMMEDIATE
PRIORITY	IMPORTANT
ROUTINE	ROUTINE
DEFERRED	DEFERRED

ARTICLE 65 **Messages to Be Read by Ships**

(a) All ships at sea, ordered to guard BAMS, must read and copy the Traffic Lists of the BAMS routines from the Zone and Area stations covering

the BAMS area which they are traversing. *Also, all ships must copy all messages for them according to the Traffic List.*

When all traffic for them, as indicated in the Traffic List, has been broadcast, or if there is no traffic for them, ships must at once revert to the normal watch of 500 kcs (600 meters).

(b) Ships instructed to read *"All BAMS Routines"* shall follow the procedure as set forth in paragraph (a) above.

(c) Ships at sea are to read and decode all messages broadcast to any call sign which addresses or includes them, as follows:

Independently routed ships	Zone Call Sign i.e., BAMS Area Call Sign e.g., BAMS 6C War Radio Call Sign of ship e.g. ZGOX
Stragglers from a convoy Ships dispersed from a convoy	Zone Call Sign i.e., BAMS Area Call Sign e.g., BAMS 2A Convoy Radio Call Signs (Individual & Collective) e.g., XYD1 and XYD9 War Radio Call Sign of ship e.g., ZICG
Ships in convoy	Zone Call Sign i.e., BAMS Area Call Sign e.g., BAMS 3B Convoy Radio Call Signs (Individual & Collective) e.g., XYD3 and XYS3

*Note: Until reaching port, Stragglers, or ships dispersed from a convoy, must read and decode all messages broadcast to stragglers and to the Collective Convoy Call Sign of the convoy from which they are separated or have been dispersed.

Ships straggling from a convoy or routed independently may be addressed by their War Radio Call Signs.

Ships in convoy will never receive messages addressed to their War Radio Call Signs.

(d) BAMS messages must not be answered or acknowledged unless the ship is specially directed to do so in the text of the message.

(e) Press news is sent by several BAMS stations and may be copied for the benefit of the officers and crew providing that the copying of such news does not interfere with the maintenance of radio watches as laid down in this publication. ~~The time of press broadcasts and the stations broadcasting will be found in Article 169.~~

ARTICLE 66 Transmission of Messages

(a) Every message will normally be transmitted from the appropriate Zone and/or Area station at two consecutive routine periods, except that if both these periods fall within daylight hours a third transmission will usually be made at a routine which occurs during the hours of darkness. On the first occasion the message will be made twice, and on subsequent occasions once. In exceptional circumstances a message may be broadcast a greater number of times if special orders are given by the originator to do so. It is clearly of importance, however, that every effort should be made by a ship or ships addressed to copy a message at its first transmission.

(b) In addition to broadcasting messages from Zone and Area stations at routine periods they may be broadcast AT ANY TIME by appropriately situated Coastal stations. These stations broadcast whenever they have traffic on hand; although as a general rule they will not do so while the routines from the Zone or Area station covering their area are actually being broadcast. In cases of extreme urgency, however, they *MAY* do so; and it is partly for this reason that ships are ordered to maintain a watch on 500 kcs while they are reading their BAMS routines, if equipment permits.

(c) All messages broadcast on receipt from a Coastal Station and repeated at the next appropriate single or two-operator period will normally be broadcast in a subsequent BAMS Zone and/or Area routine.

ARTICLE 67 General Lettered and Numbered Messages

(a) General messages intended for all merchant ships in all areas are divided into two series:

(1) British BAMS lettered messages. These are originated by the Admiralty and are allotted pairs of letters in strict *alphabetical* sequence, e.g., FX, FY, FZ, GA, GB, etc.

(2) U.S. BAMS numbered messages. These are originated by the U.S. Navy Department and are allotted numbers in strict *numerical* sequence.

(b) These two series cover all general messages to merchant ships, irrespective of whether they are transmitted by radio to the ships or sent by cable to the appropriate Naval Authorities for delivery in writing to Masters of visiting merchant ships. When any message, *lettered* or *numbered*, is sent by cable the next message in the series will contain information to this effect, and will give the identifying letters or number of the cabled message. Merchant ships will thus be able to insure they have received all messages in each series.

(c) BAMS messages to all areas are broadcast to the call sign BAMS from Zone (and in some cases Area) Stations on three routines. They take precedence over all other traffic and the identifying title of either the lettered or numbered series is broadcast in plain language in the preamble of each message.

NAVEAM and HYDROLANT Messages

ARTICLE 68

(a) Non confidential navigational warnings concerning merchant ships in the North and South Atlantic and Mediterranean, are issued in two series of plain language numbered messages called *NAVEAM* (British) and *HYDROLANT* (U.S.). These are broadcast on the BAMS organization to ships in BAMS Areas 1A, 1B, 2A, 2B, 3A, 3B, 3C, 4, 8 and 9A (see Appendix A, Diagram A).

(b) Urgent messages in these two series will be transmitted by radio to ships at sea; the remaining numbered messages in the series will be passed to the Naval Authorities for issue to merchant ships on arrival in harbor. Urgent unnumbered *NAVEAM* and *HYDROLANT* messages may be broadcast from BAMS Area and/or Coastal stations. In addition urgent Hydrographic information is broadcast locally. Unless of a local or temporary nature only, these messages will subsequently be retransmitted in one or other of the numbered series.

(c) A complete series of both *NAVEAM* and *HYDROLANT* messages should be kept on board ships sailing in the areas concerned, and Masters should obtain any messages required to complete either series from the Naval Authorities at the next port of call.

(d) *NAVEAM* and *HYDROLANT* messages will ultimately be issued in "Notice to Mariners" on receipt of which the original messages should be destroyed.

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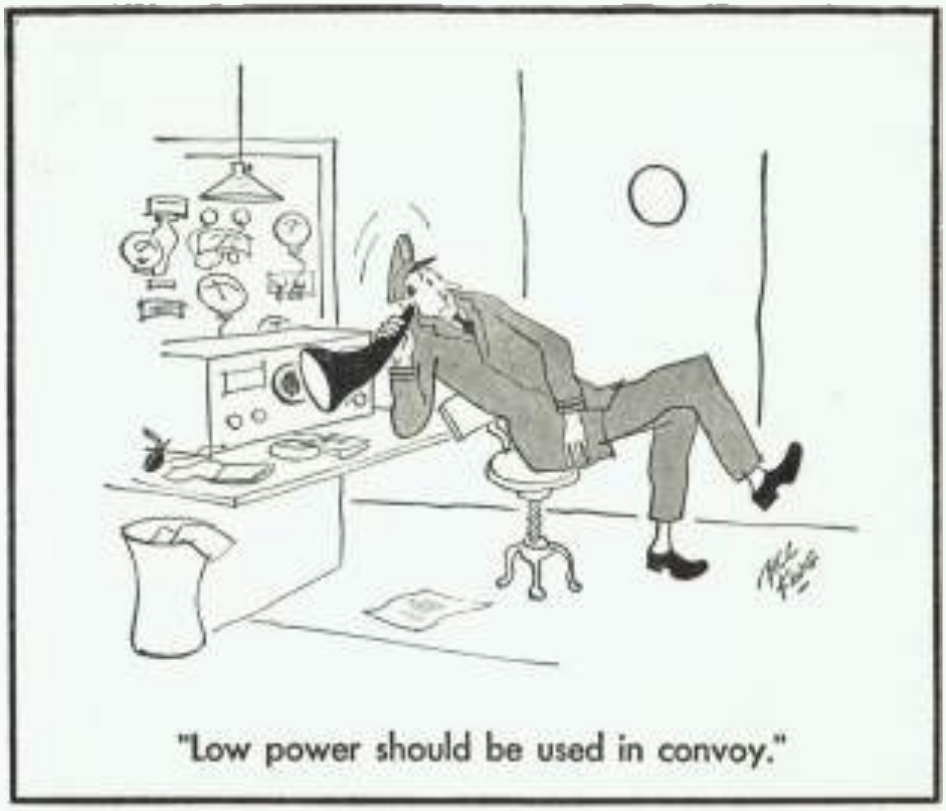
CHAPTER 9



"Low power should be used in convoy."

THE USE OF RADIO IN CONVOY.

General

ARTICLE 71

(a) Before a convoy sails, Officers in Charge of Radio Communication or the Senior Radio Officer on board each ship will be required to attend a conference under the Local Naval Authority. At this conference all details of the radio organization of the convoy will be discussed, and all final arrangements for "Guards", "Watches", and general procedure will be made. Officers attending it must insure that they fully understand all radio matters which may concern their ship while in convoy.

(b) On returning to his ship, the officer who has attended the conference, must explain the full details of the radio organization to his staff, and is to issue such orders to them as may be necessary to conform with the requirements of the organization.

(c) Officers attending the radio conference are requested to make any suggestions for the improvement of convoy radio organization generally.

Convoy Radio Call Signs

ARTICLE 72

(a) A table of convoy radio call signs is to be found in Article 58(a).

(b) Examples of convoy radio call signs.

(The convoy has been allotted the distinguishing letters "XY".)

The Call Sign of the main convoy	XYDG
The Commodore's Call Sign	XYD1
The Call Sign for Stragglers from the convoy	XYD9
The Call Sign of No. 4 column*	XYD04
The Call Sign of ship No. 53*	XYD53
The Call Sign of a joining section	XYS3
The Call Sign of the Commodore of a joining section	XYS1

* Not to be used in messages outside the convoy.

(c) Convoy suffixes containing a suffix letter other than D (see article 58(a)) will be allocated to sections of the convoy joining or breaking off from the main body. The letter selected may be varied for each sailing. Allocations are made by the local Naval Authorities sailing the main convoy and will be promulgated to convoy sailing ports and any other authorities concerned. Convoy Suffixes allocated to sections breaking away from the main convoy to proceed to ports of destination, etc., are signaled in the convoy sailing telegram, e.g., "XY" is the Convoy Radio Distinguishing Group allocated to the main convoy. The section of the convoy sailing from Boston prior to joining the main convoy is allotted the letter "S". The Convoy Radio Call Sign of the Boston Section is therefore "XYS3". The letter "Q" is allotted to the Bristol Channel section. The Convoy Radio Call Sign for this section, is "XYQ3."

(d) Convoy radio call signs, collective and individual, composed of the Convoy Radio Distinguishing Group plus a convoy suffix, may be used in messages from Naval authorities in BAMS traffic, as well as for signaling within the convoy or appropriate section of the convoy; except that call signs embodying a ship or column distinguishing signal (e.g., "XYK43", see paragraph (g) below) are not to be used for signaling *outside* the convoy. No ship in convoy will be addressed by her war radio call sign. Messages for individual ships from shore authorities will be passed on BAMS routines via the Commodore or (in escorted convoys) will be sent on Naval channels via the escort.

(e) *Communication with Stragglers.*—Should the Commodore or Escort require to transmit a message to stragglers from a convoy, the convoy radio call signs, i.e., "XYD9 DE XYD1" (or XYD6 as appropriate) will be used, unless the message is intended for a single straggler, when the War Radio Call Sign of the ship addressed will be used in place of "XYD9". In either case the message will be broadcast, and no acknowledgement or reply is to be made unless a specific instruction is contained in the message.

(f) In normal circumstances it should not be necessary for a straggler to break silence (except to make a Distress Message); should communication with the Commodore become essential, the message should be coded and broadcast twice through, addressed to the Commodore the transmitting ship using a General Radio Call Sign with her War Radio Call Sign coded at the beginning of the text for identification. Acknowledgement of such a message will be at the Commodore's discretion.

(g) *Communication within the Convoy.*—Convoy radio call signs for columns or individual ships in convoy (to be used only for signaling within the convoy) are composed of the convoy radio distinguishing group plus a convoy suffix composed of a suffix letter followed by either a column or ship's distinguishing signal as follows:

(1) Distinguishing Signals of Columns consist of the column number preceded by the figure "0", the columns of a convoy being numbered

consecutively 1, 2, 3, 4, etc., from port to starboard; thus the port wing column is always No. 1 column.

(2) Distinguishing Signals of Ships consist of the pennant number of the ship in accordance with its position in the column, preceded by the number of the column, e.g., No. 1 ship in Column 1 is "11"; No. 1 ship in Column 2 is "21", etc. as shown in the diagram below.

	No. 1 column	No. 2 column	No. 3 column	No. 4 column	etc.
Distinguishing Signals of **COLUMNS**	01	02	03	04	etc.
Distinguishing Signals of **SHIPS**	11	21	31	41	etc.
	12	22	32	42	
	13	23	33	43	
	14	24	34	44	
		25	35		

(h) *On exchanging stations in or on leaving a convoy.* When ships leave a convoy there is no change in the Convoy Radio Call Signs of remaining ships, unless specially ordered. If, after a convoy has formed up, more ships join, these ships will be ordered to occupy vacant positions in the most suitable columns. On receipt of this order, the ships joining are to assume the Convoy Radio Call Sign corresponding to the position they are to occupy.

(i) Ships ordered to change or exchange stations in a convoy are at the same time to change or exchange Convoy Radio Call Signs. It is therefore important to insure that the Deck Officer of the Watch notifies the Radio Office without delay of any such change or exchange of station of his own ship.

CHAPTER 9

USE OF RADIO IN CONVOY

ARTICLE 73 Convoy Time

(a) *Convoy Time* is the time ordered by the Commodore to be kept by ships of the convoy for purposes of daily life and routine on board.

(b) All times mentioned in radio or V/S signals passed BETWEEN SHIPS IN CONVOY must be expressed in *Convoy Time*.

(c) In all other messages and in all entries in the radio logs, times are invariably to be expressed in Greenwich Mean (Civil) Time.

ARTICLE 74 Preservation of Radio Silence

(a) Ships in convoy are to preserve radio silence at all times except:

(1) To transmit a Convoy Distress Message (See Art. 90).

(2) In reply to a call from the Commodore or Escort, *if ordered to do so* (see Art. 94(b)).

(3) To pass a positive (zeroed) D/F bearing to the Commodore in accordance with special instructions received at the convoy conference.

(b) Should a ship in convoy have occasion to make a message to the shore, the ship must pass the message visually (if possible) to the Commodore. If the message is of vital importance the Commodore will arrange with the Escort Commander to pass the message to the shore authorities by Naval channels. In the absence of an Escort the Commodore will decide whether to break radio silence and forward the message.

(c) In certain exceptional circumstances a ship in convoy may be ordered by the Commodore to break silence to pass a message to a shore station or authority outside the convoy. Any ship so ordered is to pass the message in accordance with instructions signalled by the Commodore.

ARTICLE 75 Use of Low Power

(a) When communicating *within the convoy* on 500 kcs (600 meters), the power used is to be kept to an absolute minimum to avoid disclosing the presence or position of the transmitting ship (and consequently that of the convoy as well) to hostile D/F stations. The slightest movement of the needle of the aerial ammeter indicates ample radiation for the purposes required.

ARTICLE 76 Watchkeeping

(a) Detailed instructions for watchkeeping by ships in convoy are contained in Chapter 10.

(b) The auto-alarm is not to be used as such by ships in convoy. When watch on 500 kcs (600 meters) is required to be maintained, however, the auto-alarm may, if necessary, be used as a second channel receiver during such periods as the main receiver is required for reading BAMS routines, etc., on another wave frequency.

On Straggling

ARTICLE 77

(a) Any ship which straggles from a convoy is to set radio watch immediately as for an independently routed ship, in accordance with the number of radio officers carried (see Article 120), except that for the first 48 hours after straggling, or in the event of receiving a signal "Proceed direct to straggler's route" for 48 hours from receipt of such a signal, stragglers with only one radio officer sailing under Organization A (see Article 83) are to read all BAMS Zone and Area routines.

CHAPTER 10

"All ships must work in close harmony."

RADIO ORGANIZATION IN CONVOY.

ARTICLE 81

General Instructions

(a) Radio Guards

A Radio Guard is a ship detailed to do specific radio duties in accordance with special instructions which will be given her at the time. Details of these guards are as follows:

(1) BAMS Guard

The Commodore is BAMS Guard for all M/F D/F Guards and Special Search Guards, while these ships are actually carrying out guard duty, and for Single Radio Officer Ships OUTSIDE special Single-Operator Watchkeeping Periods (see Appendix B)

When the Commodore wishes M/F D/F Guards and Special Search Guards to read a particular BAMS routine, while such ships are actually carrying out their guard duties, he will make by V/S the signal: "Read next BAMS Zone or Area routine from station indicated". This procedure will only be used when it is impracticable or undesirable to pass a message by V/S. The Commodore will subsequently confirm by V/S that these Guards have received the signal. On receipt of instructions from the Commodore to read a BAMS routine, the ships concerned should "double-bank" and continue to maintain their guard duties and loud-speaker watch. If equipment or personnel prevents "double-banking", the BAMS routine must be read and normal guards suspended during the reading.

The Commodore is also BAMS Guard for all ships whose equipment or personnel prevents reception of pertinent BAMS transmissions.

(2) 500 kcs Guard

The Vice Commodore is 500 kcs Guard, and is responsible for passing to the Commodore signals received on 500 kcs when the Commodore is reading BAMS routines or BAMS transmissions on the working waves of Coastal stations.

(3) M/F D/F Guards

Ships are detailed to maintain M/F D/F watches on specified medium frequencies. They are responsible for reporting to the Commodore, in accordance with instructions in C.B. 3082 (12/42). They will maintain M/F D/F watches in accordance with schedules in the Convoy Communication Plan or as ordered by the Commodore. When not maintaining M/F D/F watches these ships are to keep the normal required watches.

(4) **Special Search Guards**

Ships are detailed to maintain Special Search watches on any specified frequencies in accordance with schedules in the Convoy Communication Plan or as ordered by the Commodore. These ships are responsible for reporting to the Commodore all special information which is requested. When not maintaining Special Search watches, they are to keep the normal required watches.

(5) **Method of Passing Information to Commodore**

The Commodore will determine whether visual means or R/T will be used to pass in messages. If R/T is to be used, the Commodore will give instructions as to its proper use. Messages are to be passed as received and not decoded before passing. They are to be passed as quickly as possible by whichever method is permitted at the time. If R/T is permitted, Radio Guards fitted with R/T should pass their reports on the R/T convoy wavelength to both the Commodore and Escort Commander. If V/S only may be used, reports should be passed to the Commodore, who will be responsible for passing them to the Escort Commander, if considered necessary.

(6) **Responsibilities of Commodore and Vice Commodore**

The Commodore is responsible for passing to those ships not able to guard BAMS or 500 kcs any vital information received from the various guards which may concern other ships. The Vice Commodore is responsible for passing to the Commodore any vital information received on 500 kcs during periods in which the Commodore has shifted watch from 500 kcs to read BAMS transmissions from a Coastal station.

(b) R/T Communication

(1) Testing

R/T silence may be relaxed in the area East of 8° West from 58° 30' North, as far South as the Bristol Channel for the purpose of tuning and testing sets. In all other areas R/T silence must be preserved except as stated below.

(2) **R/T Silence**

(a) Medium Frequency (300 to 3,000 kcs) and High Frequency (3,000 to 30,000 kcs) —Strict R/T silence is in force unless relaxed by the Senior Officer, Escort, for one of the following reasons:

(a) To permit M/F D/F guards to pass in positive reports of U-boat homing signals (see C.B. 3082, paragraph 2B).

(b) To permit ships fitted with Radar to report "echoes."

(c) Intercommunication between Commodore and Escort.

(d) Tuning or testing of R/T transmitters.

It must be realised that U-Boats can obtain D/F bearings on 2,410 kcs and may initiate false calls in an endeavour to get ships to break R/T silence and so obtain a D/F bearing. The unnecessary use of R/T is liable to disclose to the enemy the near presence of a convoy of which he was previously not aware.

(ii) Very High Frequency (30,000 to 300,000 kcs). Unless otherwise ordered by the Senior Officer, Escort, strict radio silence is in force except as follows:—

(a) As directed by the Commodore

(b) In accordance with the instructions contained in the Convoy Communication Plan

(3) **Control of Communication**

(i) The Senior Officer, Escort, controls R/T communication on the Convoy R/T wave and strict compliance with his orders, good R/T procedure and discipline are essential if signaling is to be efficient and rapid. Reports must always be short and concise.

(ii) It must always be borne in mind that R/T can be intercepted by the enemy. Ships must therefore be on the alert and must take care not to transmit in plain language information which may be of use to the enemy (for example, geographical position, course and speed of convoy, etc., etc.). If it is essential to use R/T for a signal which would be of great value to the enemy if intercepted, it should be coded in WIMS Vol. 2, recoded, and the groups spoken phonetically.

(4) **Convoy R/T Call Signs**

See Article 53 for complete information on convoy R/T call signs.

Radio Organizations

ARTICLE 82

(a) There are three distinct *Radio Organizations* for convoys, namely, A, B and C. Details of these organizations are given on the following pages. Special Radio Organizations may be promulgated by Local Naval Authorities in order to meet unusual or special conditions for any particular convoy movement.

(b) A "Loud-Speaker Watch" is defined as a watch on a loud-speaker (if fitted), otherwise a watch by means of headphones placed near the Radio Officer.

(c) The expression "All BAMS routines" is defined as a watch in accordance with Article 65, paragraph (a).

CHAPTER 10

RADIO ORGANIZATIONS IN CONVOY

ARTICLE 83

Organization "A"

This organization is normally in force in ocean convoys. It is also in force in U. S. Coastal and Mediterranean convoys. Watches are to be maintained as follows:

(a) **Commodore**

(1) Continuous watch on 500 kcs, shifting to read BAMS traffic transmitted on the working waves of the Coastal stations outside BAMS routines.

(2) A second and independent watch on *all* BAMS routines.

(3) Continuous loud-speaker watch on 2410 kcs, or on VH/F set if battery arrangements permit, otherwise loud-speaker watch on 2410 kcs or on VH/F set during hours of darkness.

Note: The Commodore is BAMS Guard.

(b) **Vice Commodore**

(1) Continuous watch on 500 kcs. Does not shift to working waves to read BAMS messages from Coastal stations.

(2) A second and independent watch on *all* BAMS routines.

(3) If fitted with R/T, a loud-speaker watch during hours of darkness on 2410 kcs or on VH/F set.

Note: The Vice Commodore is 500 kcs Guard.

(c) **M/F D/F Guards**

(1) M/F D/F watches in accordance with schedules in Convoy Communication Plan or as ordered by the Commodore.

(2) Loud speaker watch on 2410 kcs or on VH/F set (or on 500 kcs if not fitted with 2410 kcs or VH/F set) during M/F D/F watches.

(3) Normal required watches when not maintaining M/F D/F watches.

(d) **Special Search Guards**

(1) Special Search watches in accordance with schedules in Convoy Communication Plan or as ordered by the Commodore.

(2) Loud-speaker watch on 2410 kcs or on VH/F set (or on 500 kcs if not fitted with 2410 kcs or VH/F set) during Special Search watches.

(3) Normal required watches when not maintaining Special Search watches.

(e) **Ships With Three Radio Officers**

(1) Continuous watch on 500 kcs, shifting to read all BAMS routines and BAMS traffic transmitted on the working waves of the appropriate Coastal stations. While reading BAMS transmissions, if equipment permits, 500 kcs watch is to be kept on loud-speaker.

(f) **Ships With One or Two Radio Officers**

(1) Watch on 500 kcs during Special Single- or Two-Operator Watchkeeping Periods (see Appendix B), shifting to read BAMS routines and BAMS traffic transmitted on the working waves of the appropriate Coastal stations during these periods. While reading BAMS transmissions, if equipment permits, 500 kcs watch is to be kept on loud-speaker.

(g) **Ships With Unapproved Receivers**

(1) With three Radio Officers all BAMS routines.

(2) With one or two Radio Officers all BAMS routines transmitted during the Special Single- or Two-Operator Watchkeeping Periods (see Appendix B).

Note: When in Organization "A", the 500 kcs watch is dependant on the ship being fitted with an approved type receiver, but any available receiver is to be used to insure reception of BAMS routines from Zone and Area stations.

(h) **Stragglers**

(1) All stragglers conform to the instructions contained in Article 77.

Organization "B"

ARTICLE 84

This organization is for use in ocean [redacted] convoys during fog, alarm or enemy attack.

It is to be assumed without orders:

(1) **During alarm or enemy attack**, and is to be maintained until further orders are received.

(2) **When in fog***. A ship is deemed to be in fog under either or both of the following circumstances:

(i) If the Commodore's signals cannot be seen.

(ii) If a ship on the beam in the next column but one (second column over) cannot be seen.

(3) **In heavy weather***. When weather becomes such that it is likely that any ship in the convoy will have to heave to.

* Note: Ships are to revert automatically to Organization "A" as soon as efficient V/S communication is restored.

CHAPTER

10 RADIO ORGANIZATIONS IN CONVOY

When watch is shifted to read BAMS transmissions, a human or a loud-speaker watch must be maintained on 500 kcs.

During the maintenance of Organization "B", all ships are to guard 500 kcs as indicated below. If equipment or personnel prevents any ship from guarding BAMS or special watches and 500 kcs simultaneously, the 500 kcs guard must be maintained and the other guards discontinued.

Radio Watch Is to Be Kept as Follows:

(a) Commodore

(1) Continuous watch on 500 kcs, shifting to read BAMS traffic transmitted on the working waves of Coastal stations, during which time loud-speaker watch on 500 kcs is to be set.

(2) A second and independent watch on *all* BAMS routines.

(3) Continuous loud-speaker watch on 2410 kcs or VH/F set.

Note: The Commodore is RAMS Guard.

(b) Vice Commodore

(1) Continuous watch on 500 kcs.

(2) A second and independent watch on *all* BAMS routines.

(3) If fitted with R/T, continuous loud-speaker watch on 2410 kcs or VH/F set.

(c) M/F D/F Guards

(1) M/F D/F watches in accordance with schedules in Convoy Communication Plan or as ordered by the Commodore.

(2) Loud-speaker watch on 2410 kcs or on VH/F set (or on 500 kcs if not fitted with 2410 kcs or VH/F set) during M/F D/F watches.

(3) Watches as shown in paragraphs (e) and (f) below when not maintaining M/F D/F watches.

(d) Special Search Guards

(1) Special Search watches in accordance with schedules in Convoy Communication Plan or as ordered by the Commodore.

(2) Loud-speaker watch on 2410 kcs or on VH/F set (or on 500 kcs if not fitted with 2410 kcs or VH/F set) during Special Search watches.

(3) Watches as shown in paragraphs (e) and (f) below when not maintaining Special Search watches.

(e) Ships With Two or Three Radio Officers

(1) Continuous watch on 500 kcs. Shift to read BAMS routines only if a simultaneous loud-speaker watch can be maintained on 500 kcs.

(f) **Ships With One Radio Officer**

(1) During enemy attack or alarm—continuous watch on 500 kcs.

(2) During fog, watch on 500 kcs is to be maintained during the first two hours; thereafter, during Special Single-Operator Watchkeeping Periods (see Appendix B). Shift to read BAMS routine only if a simultaneous loud-speaker watch can be maintained on 500 kcs.

(g) **Ships With Unapproved Receivers**

(1) Watches as in (c) and (f) above according to the number of Radio Officers aboard.

Note: When Organization "B" is assumed, the risk from radiating receivers on 500 kcs has to be accepted. Radio Officers must, however, take the greatest care to prevent their receivers oscillating.

(h) **Stragglers**

(1) All stragglers conform to the instructions contained in Article 77.

Organization "C"

ARTICLE 85

This organization is for use in United Kingdom Coastal Convoys.

(a) **Frequency**

2,410 kcs (124.5 meters).

(b) **Watches**

All ships which are able to do so are to set R/T loud-speaker listening watch on the Convoy frequency:

(1) From ½-hour after sunset to ½-hour before sunrise.

(2) When attacked.

(3) When visibility is less than 1 mile.

(4) When ordered to do so by Senior Officer, Escort, or Commodore.

(c) **R/T Tests**

Whenever possible the Senior Officer, Escort, will arrange a transmission for test purposes in order to allow merchant ships to set their receivers correctly to the wave in use.

(d) **Purpose of the R/T Watch**

(1) Broadcasts are made in plain language and times mentioned are Convoy Time. Bearings and distances are calculated FROM THE APPROXIMATE CENTER OF THE CONVOY.

(2) At present the main object of the R/T broadcast is to give warning of enemy air or E-Boat attack, warning of the approach of friendly aircraft, and orders for opening or ceasing fire. Air raid warnings may also be broadcast.

CHAPTER 11

"It may also be necessary to report by radio, distress not due to enemy action."

TRANSMISSION OF RADIO MESSAGES BY SHIPS IN CONVOY.

Distress Messages Made By a Ship in Convoy

ARTICLE 90

(a) The only forms of distress due to enemy action which are likely to occur normally without warning to a ship in convoy, and which may therefore need to be signaled to the Commodore and Escort, are those due to submarine or mine. It may also be necessary to report by radio, distress (such as collision) not due to enemy action.

(b) It should not normally be necessary for a ship in convoy when in distress from attack by enemy surface craft or aircraft, or on sighting hostile forces to transmit a radio message. In the case of such attack a ship's distress will usually be witnessed by other ships in company with her and visual signals are provided for inter-convoy communication. Should the master, however, have reason to think that an attack on his ship has not been observed or that visual signals cannot be passed satisfactorily (e.g., in low visibility, at night, or when a ship is in the direction of the rising or setting sun), he is to order the appropriate Distress Message to be transmitted by radio. A distress message should not be made by radio to report collision unless there is imminent risk of foundering or further mishap, and visual or sound signaling cannot be used satisfactorily. The decision whether or not to report by radio is the Master's responsibility.

(c) A Distress Message must always be transmitted by radio if a ship in convoy sights or is attacked by a submarine. Silence is not to be broken until the presence of the submarine has been established with reasonable certainty.

(d) A Distress Message made by a ship in convoy is to be transmitted on 500 kcs using low power for the information of the Commodore and Escort. The message is to be made once through only. The Commodore will acknowledge it. If no acknowledgement is received, the message is to be repeated.

(e) *Components of a Distress Message.*

(1) The appropriate Distress Signal (see Article 147, paragraph (b)).

(2) The letters "DE" followed by the Convoy Radio Call Sign of the transmitting ship.

(3) The nature of the attack or distress (see Article 147, paragraph (d)).

(f) *Example of Distress Message:*

(1) S S. "GOODSHIP" (No. 41 in a convoy, with distinguishing letters XY) is torpedoed in convoy. S S. "GOODSHIP" makes:

SSSS SSSS SSSS DE XYD41 TORPEDOED

If the side of the attack is definitely known, it should be indicated by adding the word "STBD" or "PORT" as appropriate.

(2) When a ship equipped with net defense has a torpedo caught or exploded in its net, the following type of report should be made *during darkness*:

SSSS SSSS SSSS DE XYD53 TORPEDO (EXPLODED) IN STBD (PORT) NET

During daylight, when practicable, visual signals should be used.

(g) In addition to the components given in paragraph (e) above, a Distress Message transmitted to report the *sighting* of enemy forces, especially in the case of a submarine, should give the relative bearing of the enemy from the transmitting ship, indicated by one of the following words:

AHEAD	**STBD BOW**	**STBD BEAM**	**STBD QRTR**
ASTERN	**PORT BOW**	**PORT BEAM**	**PORT QRTR**

and the initial Distress Message should be followed wherever possible by a further report of the enemy's movements.

(h) *Examples of Enemy Sightings:*

(1) S.S. "GOODSHIP" sights the periscope of a submarine and makes:

SSSS SSSS SSSS DE XYD41 PERISCOPE STBD BOW

The Commodore will acknowledge by making:

DE XYD1 R

(2) S.S. "GOODSHIP" then reports further details in accordance with paragraph (g) above:

DE XYD41 PERISCOPE TWO MILES MOVING STBD TO PORT

The Commodore will acknowledge as before.

(i) *When uncertain as to Source of Damage.*

When uncertain as to the source of the damage the initial report is to take the following form:

"XYD1 DE XYD41 HIT"

(*Note:* This is to be used only by ships in convoy.)

This first report is to be amplified as soon as possible by a distress message in the usual form.

(j) *Reporting Distress of Another Ship.*

When it is observed that a ship in convoy has been seriously damaged by enemy action and has not originated a distress message either by V/S or radio, an adjacent ship is to transmit a distress message for the damaged ship using the following procedure:

"SSSS SSSS SSSS DE XYD13 TORPEDOED XYD23"

(Where No. 13 has been torpedoed.)

Distress Messages Made by Stragglers from a Convoy

ARTICLE 91

(a) A "Straggler", for the purpose of transmitting Distress Messages, is defined as a vessel officially forming part of a convoy, which has definitely become separated from her convoy and is out of sight of both convoy and all escorting vessels.

(b) A Straggler may make a Distress Message of any type but should conform to the instructions laid down for independently routed merchant ships, and should transmit her Distress Message in accordance with Article 146.

Reporting a Distress Message by the Commodore on FULL POWER

ARTICLE 92

(a) Should the Commodore of a convoy, in the absence of an Escort, decide to break radio silence on full power to report the distress of a ship in his convoy, he is to transmit the report as an ordinary coded message, using the *General Radio Call Sign* procedure and *NOT* as a Distress Message unless assistance is urgently required.

Radio Signal to "Cease Firing Snowflake Rockets" at Night (British Convoys Only)

ARTICLE 93

(a) The firing of "Snowflake" rockets during an attack on a convoy by night MUST CEASE immediately the signal to stop firing is received. In addition to making the appropriate signal by visual means, therefore, the Commodore may elect to signal by radio on 500 kcs (600 meters).

(b) The "Snowflake Cease Fire" signal by radio consists of the letter accented "U" made several times without any preliminary call or call sign. Reception of this signal is to be reported to the bridge at once.

(c) If radio watch is not actually being kept when an attack on the convoy develops, it is to be set immediately on 500 kcs, and thereafter maintained in accordance with the instructions laid down in Article 84. The Deck Officer of the Watch is responsible for ordering the Radio Officer to set watch.

Maneuvering by Radio

ARTICLE 94

(a) *A Maneuvering Signal* is a signal altering the course or speed of the convoy, or of some part of it, and may be recognized by its distinctive form and by the fact that it does NOT conclude with a Time of Origin. Maneuvering Signals are to be obeyed on receipt of the Executive Signal "XX" which will be transmitted by the Commodore when he wishes the maneuver to be carried out. This may not be for some minutes after he has transmitted the actual Maneuvering Signal itself.

(b) The text of Maneuvering Signals transmitted by radio must always be made *twice through*. No ship is to acknowledge receipt unless controlled to do so by the Commodore in accordance with Article 95.

(c) Alterations of Course.

(1) Signals ordering Alterations of Course are to be made in accordance with signals contained in "WIMS" 1 modified to the extent that they are always to be made "to the course indicated." Thus an alter course signal will invariably consist of one of the three letters "S", "A", or "T", followed by a three figure group.

(2) The emergency method of altering course by turning all ships of the convoy together 45° to starboard or port, described in "WIMS" 1 Article 96 (b) is *not* to be used by radio.

THE ACTUAL COURSE TO WHICH SHIPS ARE TO TURN MUST BE INDICATED.

(d) *Examples:*

(1) The Commodore wishes to alter the course of the convoy by wheeling to 265° and decides to make the necessary maneuvering signal by radio. The Commodore makes:

$\overline{CT}$ XYD3 XYD3 XYD3 DE XYD1 $\overline{BT}$
S 265 $\overline{UD}$ S 265 $\overline{AR}$

(2) The convoy is steering 270° and the Commodore wishes to turn all ships together 45° to port, and to make the Maneuvering Signal by radio. He orders the necessary signal to be made to turn all ships together to a course of 175°. The signal is made in the form:

$\overline{CT}$ XYD3 XYD3 XYD3 DE XYD1 $\overline{BT}$ T 175
$\overline{UD}$ T 175 $\overline{AR}$

(e) In both the above cases the Commodore, when he wishes to carry out the maneuver ordered, will make the Executive Signal as follows:

XYD3 XX

(f) In all ships of a convoy the receipt of a maneuvering signal by radio must be reported to the Deck Officer of the Watch **IMMEDIATELY**: and some person on the bridge must thereafter remain at the voicepipe or telephone communicating with the Radio Office until the Executive Signal has been received. The Radio Officer must not leave the Radio Office to deliver such messages.

(g) **Alterations of speed.**—Maneuvering signals ordering an alteration of speed will consist of the letter "K" followed by the actual speed to which it is required to alter.

(h) *Example:*

The Commodore wishes to alter the speed of the convoy to nine and a quarter knots. The Commodore makes:

$\overline{CT}$ XYD3 XYD3 XYD3 DE XYD1 $\overline{BT}$ K9 $\overline{EX}$ 1
$\overline{XE}$ 4 $\overline{UD}$ K9 $\overline{EX}$ 1 $\overline{XE}$ 4 $\overline{AR}$

When he wishes to carry out the maneuver, the Commodore will make the Executive Signal as shown in paragraph (e) on preceding page, namely, "XX."

Note: Once the Executive Signal for a maneuver has been made the maneuver cannot be cancelled. Should the Commodore for any reason wish to change his mind after the Executive Signal has been transmitted, he must make a new Maneuvering Signal which will restore the convoy to the course or speed which he now requires.

Acknowledging a Message — Procedure for "Controlling" Replies

ARTICLE 95

(a) Minimum power is to be used for all messages transmitted by radio within a convoy, and all messages are to be *broadcast*—that is to say, will not receive any acknowledgment or reply, except in the case of Distress Messages, when the Commodore will give a brief acknowledgment.

(b) *Controlling Replies.* When the Commodore transmits a message, such as a Maneuvering Signal, he may wish to confirm definitely that it has been received by all ships before he makes the Executive Signal. To do this he may direct one or more ships of the convoy to reply. If several ships are so directed simultaneously by the use of a Collective Radio Call Sign, they are to reply in numerical sequence of Convoy Radio Call Signs.

(c) *Examples:* The Commodore has made a Maneuvering Signal by radio to the convoy having a Convoy Radio Distinguishing Group "XY".

(1) To direct a single ship to reply, he makes: **XYD53 K**

On hearing this, No. 53 immediately makes: **DE XYD53 R**

Or, if he missed the signal: **DE XYD53 $\overline{UD}$**

All other ships maintain silence.

(2) To direct all the ships of No. 1 column (Nos. 11, 12, 13, and 14) to reply, the Commodore makes: **XYD01 K**

On hearing this, the ships of No. 1 Column transmit as follows.

No. 11 makes **DE XYD11 R**
No. 12 " **DE XYD12 R**
No. 13 " **DE XYD13 UD***
No. 14 " **DE XYD14 R**

(* Assuming that he had missed the signal.)

(d) *If a ship, which is being directed to reply under a Collective Radio Call Sign, does not do so within ten seconds of her correct turn, the next ship which has been directed under that call sign is to do so. In this case the ship which has missed her turn is to reply immediately after the last ship directed under the call sign.*

(e) If a ship is not directed to reply but is unable to understand the message sent by the Commodore, she should request a repetition of the message by making the procedure signal UD (e.g., DE XYD41 UD).

(f) In a large convoy it sometimes occurs that a signal transmitted by the Commodore is not received, or not correctly received, by all ships. To control certain detailed ships to "repeat back" a message exactly as received from the Commodore, the Commodore will make:—

XYD53 G UD G K

whereupon ship No. 53 will transmit the message in the form it was received.

(g) If several ships are controlled to "repeat back" simultaneously by the use of a collective convoy radio call sign, they are to transmit in numerical sequence of convoy radio call signs as in paragraphs (c) (2) and (d) above.

ARTICLE 96 General Messages

(a) Under certain conditions, the Commodore might consider it necessary to send a coded message or a plain language message to the convoy or to a portion of the convoy other than a Maneuvering Signal.

(b) If radio silence is broken to pass such a message inside the convoy, the message will conclude with the break sign followed by the time of origin in convoy time. When the message contains an order, the time for its execution may be stated in the text.

(c) When the Commodore transmits a coded message which necessitates an answer by radio from some ship or ships of the convoy, such ship or ships will be directed to transmit the answer after sufficient time has elapsed to enable the original message to be decoded and the answer prepared.

CHAPTER 12

"Did you hear the one about the traveling salesman?"

R/T PROCEDURE IN CONVOY.

ARTICLE 100

Use of R/T Procedure

(a) The R/T procedure given in this chapter is to be used by merchant ships for communications with their Escort and with each other.

ARTICLE 101

Words Shown in Parentheses

(a) The use of words shown in parentheses thus (Hullo), is optional.

ARTICLE 102

General

(a) Messages transmitted by radio telephone are not necessarily written down, but operators should whenever possible make a short note of their purport. They must therefore be kept short and to the point. This is best achieved by the use of standard phraseology. Messages which have to be given by the receiving operator to another person should preferably be written down.

(b) When using radio telephone, speech will be clear and slow with an even emphasis on each word. Words will not be run together.

(c) Messages will be spoken by natural phrases and not word by word.

(d) In the interest of security, transmission by radio telephone will be as short and concise as possible consistent with clearness.

ARTICLE 103

Phonetic Alphabet

(a) When necessary to identify any letter of the alphabet the standard phonetic alphabet is to be used. This alphabet is listed below:

LETTER SPOKEN AS	LETTER SPOKEN AS	LETTER SPOKEN AS	LETTER SPOKEN AS	LETTER SPOKEN AS
A-ABLE	F-FOX	K-KING	P-PETER	U-UNCLE
B-BAKER	G-GEORGE	L-LOVE	Q-QUEEN	V-VICTOR
C-CHARLIE	H-HOW	M-MIKE	R-ROGER	W-WILLIAM
D-DOG	I-ITEM	N-NAN	S-SUGAR	X-XRAY
E-EASY	J-JIG	O-OBOE	T-TARE	Y-YOKE
				Z-ZEBRA

(b) *Coded groups.*

Example: **LUXO** will be spoken as **"Love Uncle Xray Oboe."**

(c) *Difficult words will be both spoken and spelled.*

Example: **"Catenary—I spell Charlie Able Tare Easy Nan Able Roger Yoke—Catenary."**

CHAPTER 12

RIT PROCEDURE

ARTICLE 104

Pronunciation of Numerals

(a) When figures are transmitted by radio telephone the following rules for their pronunciation will be observed:

FIGURE SPOKEN AS	FIGURE SPOKEN AS	FIGURE SPOKEN AS
0-ZERO	3-TREE	6-SIX
1-WUN	4-FOW-ER	7-SEVEN
2-TOO	5-FI-IV	8-ATE
		9-NINER

ARTICLE 105

Call Signs

(a) Call signs composed of letters or letters and figures must be transmitted by means of the phonetic alphabet and numeral pronunciation, thus:

Call sign **A B D 3** shall be transmitted as: **Able baker dog thrih-ree.**

(b) A table showing convoy R/T call signs is included in article 58.

ARTICLE 106

Component Parts of a Message

Every radio telephone message consists of three basic parts:

(1) *The call* (2) *Text* (3) *Ending*

(a) The call of a R/T message may take one of the following forms:

Case 1—Full Call	Example
[HULLO]	(HULLO)
Call sign receiving station	ABLE BAKER TEAM
This is	This is
Call sign station calling	ABLE BAKER CHIEF
Case 2—Abbreviated call	**Example**
This is	This is
Call sign station calling	ABLE BAKER CHIEF
The Text	

(b) **The text** may consist of plain language, code words or figures. If it is necessary to spell out a word, the phonetic alphabet will be used.

(c) **The ending.** Every transmission will end with one of the following procedure words:

PROCEDURE WORD	MEANING
OVER	MY TRANSMISSION IS OVER AND I EXPECT A RESPONSE FROM YOU
OUT	THIS CONVERSATION IS ENDED AND NO RESPONSE IS EXPECTED

EXAMPLE 1

Call. . . . . .(Hullo) ABLE BAKER CHIEF this is ABLE BAKER BOSS
Text. . . . . What is the speed
Ending . . . . . .Over

EXAMPLE 2

Call. . . . . .(Hullo) ABLE BAKER BOSS this is ABLE BAKER CHIEF
Text. . . . . .Speed is nine knots
Ending. . . . . .Out

Time of Origin

ARTICLE 107

(a) The Time of Origin, when employed, will be expressed in four digits and will be preceded by the word "Time".

ARTICLE 108

Procedure Phrases

(a) It is inadvisable to lay down precise wording for all procedure phrases likely to be required in radio telephone work. However, the following are to be adopted.

WORD OR PHRASE	MEANING
Roger	"I have received all of your last transmission"
Acknowledge	(Used by originator) "Let me know that you have received and understood this message"
Wilco	"Your last message (or message indicated) received, understood and (where applicable) will be complied with"
How do you hear me?	"How do you hear me?"
Speak slower	"Speak slower"
Wait	If used by itself means, "I must pause for a few seconds." If the pause is longer than a few seconds, or if "Wait" is used to prevent another station transmitting, it must be followed by the ending, "Out"
Say again	"Say again" (Except when written into the text of a message by the originator, the word "Repeat" or any phrase involving "Repeat" will never be spoken in radio telephone (R/T) communications since it has a distinct operational meaning to the British Army. When used by the Royal Artillery it means that the salvo last ordered will be fired again at the same range)
I say again	"I will say again"
Verify	"Check coding, check text (subject matter) with the originator and send correct version"
Message for you	"I wish to transmit a message to you"
Send your message	"I am ready for you to transmit"
Read back	"Repeat all of this message back to me exactly as received after I have given 'Over' "
That is correct	"You are correct"
Words twice	(a) As a request. "Communication is difficult. Please send every phrase (or every code group) twice" (b) As information. "Since communication is difficult every phrase (or every code group) in this message will be sent twice"
Correction	"An error has been made in this transmission (or message indicated). The correct version is ....."
Wrong	"What you have just said is incorrect. The correct version is ....."
Groups	"The number of groups in this code or cipher message is ....."
Break	"I hereby indicate the separation of the text from other portions of the message." To be used only when there is no clear distinction between the text and other portions of the message

Executive Signal by R/T

ARTICLE 109

(a) The Executive Signal when made by R/T will be the word "**Execute**" spoken twice.

Transmitting and Answering

ARTICLE 110

The following general rules govern the transmission of radio telephone messages when two-way working is employed.

(a) When both stations are in good communication, all parts of the transmission are made once through.

(b) If a message is to be transmitted without waiting for an answer to the preliminary call, the call sign(s) of the receiving station(s) will be transmitted (made) twice, and may be repeated also at the end of the message.

(c) When communication is difficult, phrases, words or groups may be transmitted (made) twice by using the procedure phrase "words twice".

(d) If the message is to be repeated back the procedure phrase "read back" will be used.

Example:

The convoy Commodore (ABLE BAKER CHIEF) wishes to transmit to the Vice Commodore (ABLE BAKER LUCK). The transmissions will be as follows:

TRANSMITTED BY	TRANSMISSION
Commodore	(Hello) ABLE BAKER LUCK—this is—ABLE BAKER CHIEF—Message for you—Over.
Vice Commodore	(Hello) ABLE BAKER CHIEF—this is—ABLE BAKER LUCK—Send your message—Over.
Commodore	ABLE BAKER LUCK—this is—ABLE BAKER CHIEF—speed 20 knots—Over.
Vice Commodore	ABLE BAKER CHIEF—this is—ABLE BAKER LUCK—Roger—Out.

Code Messages

ARTICLE 111

(a) In code messages the number of groups if sent will be preceded by the word "groups" immediately before the text. Code words may be transmitted as plain language words. Encoded groups will be spelled phonetically.

CHAPTER 12

R/T PROCEDURE

ARTICLE 112

Repetitions

(a) When words are missed or are doubtful, repetitions will be requested by the receiving station before receipting for the message. The procedure phrases "Say again" and "I say again" used alone or in conjunction with "all before" and "all after" "- - - - - - - to - - - - - - -" and "word after" will be used for this purpose.

(b) In giving repetitions, the transmitting station will always repeat the words used in the request to identify the portions.

ARTICLE 113

Correction of Messages

(a) *Correction during transmission.* When an error has been made by a transmitting operator, the procedure word "correction" will be spoken, the last group or phrase sent correctly will be repeated and the correct version then transmitted.

CHAPTER 13

THE USE OF RADIO OUT OF CONVOY.

General

ARTICLE 117

(a) Before sailing, the Officer in Charge of Radio Communications is required to report to the Local Naval Authority for any specific instructions on radio organization, watchkeeping, etc., relevant to the forthcoming voyage. All such instructions are to be communicated to each Radio Officer on board. Radio Officers, when reporting to the Local Naval Authorities, are requested to make any suggestions for the improvement of the Radio Organization that may have occurred to them.

(b) The following instructions in the use of radio are intended for ships when sailing independently or when they have "Straggled" from a convoy.

(c) **A "Straggler" from a convoy is a ship which has lost contact with her convoy and is out of sight of all escorting vessels.**

Transmission of Messages

ARTICLE 118

(a) All radio traffic in time of war is official and ships at sea may not use any transmitter on board without the authority of the Master or Officer of the Watch (see Article 10).

(b) Ships at sea may not transmit except (with the authority of the Master) to send:

(1) Special Radio Reports. (See Chapter 14.)

(2) Distress Messages. (See Chapter 15.)

Call Signs

ARTICLE 119

(a) The call signs to be used when transmitting messages vary in accordance with the following conditions:

TYPE OF MESSAGE	CALL SIGN*
All coded messages	General
All messages in plain language (except when passed through a neutral radio station or transmitted in accordance with Article 56(a)(1)(ii) above.)	War
All messages passed through a neutral shore radio station, or for transmission of messages relating to navigation and business of the ship when operating within Inland Waters of the United States. [Note: All such messages must be in plain language.]	International

*Note: Full particulars of these call signs are contained in Chapter 7

CHAPTER 13

USE OF RADIO OUT OF CONVOY

ARTICLE 120

Radio Watchkeeping

(a) All merchant ships sailing independently shall maintain the following watches in accordance with the number of Radio Officers on board.

(b) The expression "All BAMS routines" is defined as a watch in accordance with Article 65(a).

(c) A "Loud-speaker Watch" is defined as a watch on a loud-speaker (if fitted) otherwise a watch by means of headphones placed near the Radio Officer on watch.

British Managed Ships

(d) *SHIPS WITH THREE RADIO OFFICERS:*

(1) Continuous watch on 500 kcs shifting to read BAMS traffic transmitted on the working waves of the appropriate Coastal stations. Loud-Speaker Watch on 500 kcs is to be maintained while reading Coastal station traffic.

(2) A second and independent watch on *all* BAMS routines from the appropriate Zone and Area stations.

(e) *SHIPS WITH TWO RADIO OFFICERS:*

(1) Continuous watch on 500 kcs shifting to read all BAMS Zone and Area routines and BAMS traffic on the working waves of the appropriate Coastal stations. A Loud-Speaker Watch is to be maintained on 500 kcs while reading BAMS transmissions.

(f) *SHIPS WITH ONE RADIO OFFICER:*

(1) Watch on 500 kcs during the special single-operator watchkeeping periods laid down in Appendix B, shifting to read BAMS routines and BAMS traffic on the working waves of the appropriate Coastal stations, during these periods only. If possible, Loud-Speaker Watch is to be maintained on 500 kcs while reading BAMS transmissions.

(2) The auto alarm, if of an approved type, is to be operated *at all times* when no Radio Officer is on watch

U. S. Managed Ships

(g) *SHIPS WITH THREE RADIO OFFICERS:*

(1) Continuous watch on 500 kcs shifting to read all Zone and Area routines and BAMS traffic on the working waves of the appropriate Coastal stations. During BAMS routines, a Loud-Speaker Watch is to be maintained on 500 kcs if equipment permits.

(h) *SHIPS WITH TWO RADIO OFFICERS:*

(1) Watch on 500 kcs during the special two-operator watchkeeping periods laid down in Appendix B, shifting to read all BAMS Zone and Area routines and BAMS traffic on the working waves of the appropriate Coastal stations. During BAMS routines, a Loud-Speaker Watch is to be maintained on 500 kcs if equipment permits.

(2) The auto-alarm, if of an approved type, is to be operated *at all times* when no Radio Officer is on watch.

(i) *SHIPS WITH ONE RADIO OFFICER:*

(1) Watch on 500 kcs during the special one-operator watchkeeping period laid down in Appendix B, shifting to read BAMS Zone and Area routines and BAMS traffic on the working waves of the appropriate Coastal stations.

(2) The auto-alarm, if of an approved type, is to be operated *at all times* when no Radio Officer is on watch.

Radio Watchkeeping in Emergency

ARTICLE 121

(a) When in contact with enemy forces, all merchant ships regardless of the number of Radio Officers carried, are to keep radio watch on 500 kcs and if possible read all relevant BAMS transmissions.

Position and Weather Report Forms

ARTICLE 122

(a) A written report is to be sent by the Master to the Radio Office once each four hours, preferably at the beginning of each new watch. This report is to give the position of the ship and the weather conditions at the time of the report, and in addition is to show dead reckoning positions each hour for the next four hours.

(b) This report should be sent to the Radio Office in the following form:

Date.....	GCT	GCT	GCT	GCT	GCT
POSITION		D.R. Pos.	D.R. Pos.	D.R. Pos.	D.R. Pos.
Latitude Longitude					
OR Position From					
Bearing					
Distance					
WEATHER at this time (Coded from Weather Code—WMS 1)					

CHAPTER 13

USE OF RADIO OUT OF CONVOY

When filled out, this form must not fall into the hands of the enemy. If capture is imminent, it should be burned or destroyed by equally positive methods. It must never be thrown overboard, unless in deep water in a weighted container which is sure to sink immediately.

ARTICLE 123

Difficulty in Communication on H/F

(a) In cases where difficulty is experienced in effecting communication, or when communication is not established and messages are broadcast, a brief report should be handed to the Naval Authority at the first port of arrival, with the request that it be forwarded without delay to:

The Director of Signal Division, Admiralty, Whitehall, S.W.1

or

Chief of Naval Operations, Navy Dept., Washington 25, D.C.

as appropriate

(b) These reports should contain the following particulars:

(1) Frequencies used.

(2) Date and time at which calling commenced.

(3) Time at which call was answered and by whom.

(4) Time at which receipt was given.

(5) If calls were not answered, time at which message was broadcast.

(6) Date and time of origin of message and number of groups.

(7) Remarks, including local atmospheric conditions.

ARTICLE 124

Use of D/F Apparatus

(a) Masters of merchant ships equipped with H/F direction finding apparatus are to instruct their radio officers that in certain circumstances it may be necessary for the H/F D/F Officer to use the M/F D/F instrument.

(b) Arrangements should be made to insure co-operation between the Radio Officer and H/F D/F Officer, but the procedure is only to be used provided normal radio watchkeeping is not impeded in any way.

CHAPTER 14

Position Reports

TRANSMISSION OF RADIO MESSAGES BY SHIPS OUT OF CONVOY.

General

ARTICLE 130

(a) Ships sailing independently must not break radio silence except when in distress (see Chap 15) or in accordance with Articles 131 to 139.

(b) In every case the Master is solely responsible for giving the order for any of the following radio messages to be transmitted.

(c) Passing instructions need not normally be included since all messages received by shore radio stations are immediately passed to the nearest Naval Authority. Passing instructions must be included in plain language in the preamble of a message when:

(1) Specially instructed to do so by a Naval Authority prior to leaving port.

(2) Specifically instructed to acknowledge or reply to a message from a Naval Authority.

Acknowledging a Message from Shore Authorities

ARTICLE 131

(a) A shore radio station or warship which has a message for a merchant ship routed independently will call the ship by her *War Radio Call Sign* and broadcast the message. The normal peace-time procedure whereby the ship called should give "K" and "R" is not to be followed. *The merchant ship is to maintain silence.*

(b) In certain exceptional circumstances, however, the originator may require to know definitely that the message has been received. In this case a direct order to break silence and acknowledge receipt will be included in the coded text of the message.

(c) On receipt of this order, and after obtaining the Master's permission, silence is to be broken and a brief coded message of acknowledgment transmitted. The transmission should be on H/F if practicable.

(d) Silence is also to be broken to report a position, etc., if so directed by a Naval Authority.

Requesting a Repetition of a Message

ARTICLE 132

(a) If for any reason a message addressed to an individual ship, or transmitted to a *Collective Call Sign* which includes the ship, cannot be decoded, the message may be checked by copying the same message on a subsequent BAMS routine or during the next single-operator period if the message was originally received from a Coastal station. If the message cannot be decoded after such a check, the Master must exercise his discretion whether radio silence is to be broken to request a repetition.

(b) On no account is silence to be broken for the purpose of requesting a repetition unless it is absolutely certain that the ship is vitally concerned with the contents of the message. This will be indicated by the fact that the ship was called by her own *War Radio Call Sign*, or that the message is addressed to some small group of ships, e.g., "stragglers from a convoy" of which she is one. Radio silence is not to be broken if other ships are within sight. Every effort should then be made to obtain the complete message by visual signals.

(c) If a message has been only partly received or fully received but cannot be decoded and the Master decides to break silence for a repetition, the request in code should, [illegible], be made on H/F direct to one of the stations given in Appendix F. If the use of H/F is impracticable, the request should be passed on 500 kcs direct to the nearest United Nations' Coastal station. If no such station is within range it may be broadcast twice on 500 kcs to "UNWS".

(d) A request for a repetition must identify the message required as fully as possible, i.e., it should contain the Time of Origin and the call signs of the addressee and the station from which the message was broadcast. It is not necessary to give the time at which it was broadcast.

(e) On receipt of the request, the coding will be checked by the appropriate authorities and the message retransmitted, after the necessary check has been carried out, at the next routine period.

(f) If it is found that the message as originally transmitted was correct, it will be repeated with the same Time of Origin as the original message. If, however, it has been found necessary to recode the original message, it will be retransmitted with a new Time of Origin and will commence with some such phrase as, "The following is a repetition of my . . . . ". This is an essential precaution necessary to maintain the security of the code used.

(g) Any message addressed to an individual ship is almost certain to contain amendments to the Route Instructions, which, if not acted upon, may endanger the safety of the ship. This fact must be taken into account when deciding whether or not to request a repetition.

ARTICLE 133 Requesting D/F Bearings

(a) Details of the procedure to be used for requesting and obtaining D/F bearings from shore D/F stations in certain areas are given in Appendix A.

(b) Radio silence should not be broken to ask for bearings unless the need is urgent.

ARTICLE 134

Position Reports

(a) Under certain circumstances merchant ships are required to report their position by radio. Full directions for making such reports are contained in the *Route Instructions* which are handed to the Master before sailing.

(b) These reports are to be made in code, using the *General Radio Call Sign* procedure.

(c) The position is to be indicated by one of the following methods:

(1) By bearing and distance from one of the lettered route or reference positions mentioned in the route instructions. Example: "146 degrees 21K" indicates a position bearing 146 degrees 21 miles from lettered position K, or

(2) By inserting a distance in miles between the letters denoting any two of the lettered positions. This will indicate a new position at that distance in a direct line from the first of these lettered positions toward the second. Example: "F15XP" indicates a position 15 miles from lettered position F in the direction of lettered position XP, or

(3) By giving the reference letters of the position or port to which it is desired to refer.

Note: Positions are only to be indicated in terms of latitude and longitude or as a bearing and distance in nautical miles from a geographical point in:

(i) Original distress messages.

(ii) Amplifying reports of distress messages.

(iii) Messages addressed in code to United Nations warships.

ARTICLE 135

Time of Arrival Reports

(a) Ships will be required to transmit estimated time of arrival reports when approaching certain United Nations ports. Orders to transmit such reports will normally be furnished ships concerned before sailing, together with complete instructions as to transmission procedure to be used. These instructions will be contained in Sailing Orders. Occasionally a Naval Authority may order a ship by BAMS message to transmit an estimated time of arrival report. When this is done, the ship concerned shall invariably encode the required message, using *General Call Sign* procedure described in Article 55, unless the BAMS message ordering the report specifically directs the use of plain language.

(b) When approaching a Neutral port, however, such messages must be passed in plain language via the local Coastal station on 500 kcs, using the ship's *International Call Sign* and normal commercial procedure.

CHAPTER 14

MESSAGES BY SHIPS OUT OF CONVOY

ARTICLE 136

Weather Reports

(a) On occasions when radio silence is broken to make a coded message, merchant ships are to include a weather report at the end of the message. This report is to be coded in accordance with the tables given in Appendix C "WIMS," Vol. 1.

(b) Weather reports are also to be included in Distress and Amplifying Messages if time permits (see Chap. 15).

ARTICLE 137

Reporting Damage, Defects, or Grounding Not Due to Enemy Action

(a) The international "SOS" procedure is not to be used by merchant ships unless immediate assistance is required owing to grave and imminent danger from marine distress. (see Article 157, paragraph (a)).

(b) In certain exceptional circumstances, however, the Master may consider he is justified in breaking radio silence to report without delay some matter of extreme urgency unconnected with the enemy. Silence is to be broken on the direct personal order of the Master, due regard being paid by him to the position of the ship and the type of radio equipment on board. The urgency signal "**XXX**" is *not* to be used for messages of this nature.

(c) H/F transmission reduces the risk of detection and location of the transmitting ship, and should be used where practicable. If transmitted on H/F the message should be passed direct to some United Nations' shore station. If transmitted on 500 kcs, an attempt should be made to pass it direct to the nearest Coastal station; but if no Coastal station is within range it should be broadcast to the call sign "*UNWS*" (Any United Nations' Warships).

(d) Messages passed through United Nations' shore stations or broadcast to United Nations' Warships, are to be sent in code using the *General Radio Call Sign* procedure. Messages passed through a Neutral Coastal station, however, are to be made in plain language using the ship's *International Call Sign*, and are to be addressed to the nearest United Nations' Naval Authority. In no case, except distress, may a message which has been transmitted using one call sign, subsequently be repeated using the other. Should the necessity for repeating the message to a Neutral station arise, an entirely new message must be drafted and the greatest care must be taken to insure that no connection between the two messages can be established.

(e) *Example*. S. S. "Empire Bismuth" (War Radio Call Sign 2GOX), an independently routed ship, after experiencing serious engine trouble, eventually breaks down altogether in mid-ocean. The damage is irreparable,

but the ship is herself in no danger of sinking, and the transmission of an "SOS" Distress Message is therefore not justified. The Master considers it improbable that any other vessel is likely to pass within sight for some considerable time. He therefore decides to break silence to report his predicament. The ship is fitted with an H/F transmitter. H/F communication is established with Portishead GKS, and "Empire Bismuth" then makes a coded message as follows:

CT GKS DE NUM57 BT CDE 27* BT

ENCODED TEXT
ZGOX
MAIN ENGINES HAVE BROKEN DOWN BEYOND REPAIR
IN POSITION [illegible]
SHIP SEAWORTHY AND IN NO IMMEDIATE DANGER
ESTIMATE AM DRIFTING SOUTH SOUTH EAST AT HALF A KNOT

BT 1906522 AR

*Assuming that the message will code in 27 groups.

(f) Ships employed exclusively in coastal trade cannot make use of the instructions given in paragraphs (b) and (f) above. In cases of grounding, where the danger is not immediate, assistance may be obtained by calling the nearest Coastal station and making the signal "**QTG AGROUND**". The Coastal station will acknowledge receipt and give "K", whereupon the ship should transmit her call sign for fifty seconds. The bearing taken will not be passed to the ship, but will be forwarded to the Naval Authorities for action. The ship must use her *War Radio Call Sign*.

Reporting of Mines

ARTICLE 138

(a) Masters of merchant ships sailing independently are to report immediately by radio the position of any *parachute mine or other suspicious object* which may be observed to drop from an enemy aircraft.

(b) When in harbor, the nearest Naval Authority is to be informed by visual signals or other convenient means without delay.

Note: Radio silence is *not* to be broken to report the sighting or destruction of floating and moored mines. Full particulars are to be given to the Local Naval Authorities immediately on arrival in harbor.

Reporting the Rescue of Survivors

ARTICLE 139

(a) To avoid waste of time searching for survivors who have already been rescued, Masters of unescorted merchant ships fitted with H/F which have picked up survivors are to report by radio during the following night.

(b) The message should give the name of the ship to which the survivors belonged, the position in which they were rescued and the number picked up. It should also include particulars of any other boats or rafts with survivors known to be in the vicinity, and, if possible, the course they intended to steer.

(c) The message is to be made in code, using the *General Radio Call Sign* procedure.

CHAPTER 15

"Say when, sir."

TRANSMISSION OF RADIO MESSAGES BY SHIPS OUT OF CONVOY—DISTRESS MESSAGES.

Distress Messages—General

ARTICLE 145

(a) A Distress Message is:

(1) A message reporting attack, or the sighting of, and anticipated attack by hostile or suspicious forces; or

(2) An international signal reporting distress from other causes than enemy action.

(b) Any merchant ship not in convoy which encounters a hostile vessel is almost certain to be attacked. The report made by a merchant ship sailing independently on sighting a hostile or suspicious vessel which appears to be preparing for attack, should invariably take the form of a Distress Message.

(c) A Distress Message must be sent without delay. Unless it is transmitted as soon as suspicion is aroused of the intentions of the vessel in sight, the aerial or the Radio Office may be put out of action before any message has been sent.

(d) The risk of making a false report must be accepted. Such a report must, however, always be cancelled later if the Master's first suspicions prove to be unfounded. (See Article 154.)

(e) The only action required by the Master or Deck Officer of the Watch who wishes a Distress Message to be sent out is to order the Radio Officer on watch to make the appropriate TYPE of message, e.g., "Make a Warship Raider Distress Message". The Radio Officer will construct and transmit the appropriate message.

Transmission of Distress Messages

ARTICLE 146

(a) The following rules must be followed.

(1) *Broadcast the message on 500 kcs three times in plain language, using the ship's War Radio Call Sign and full power.*

(2) If no Coastal station is heard to repeat it, transmit the auto-alarm signal (twelve 4-second dashes spaced 1 second apart) and repeat the message *twice through* on 500 kcs.

(3) When no repetition from a Coastal station is heard and/or your transmission on 500 kcs is being jammed, repeat the Distress Message on H/F, if your ship is suitably equipped.

(b) The nearest Coastal station on hearing the Distress Message on 500 kcs, will retransmit it immediately in the exact form in which it was received but normally preceded by the auto-alarm signal and with the addition of the time and date of receipt followed by the call letters of the station. A shore station intercepting a Distress Message on H/F will not repeat it but will give an ordinary acknowledgment to the ship in distress.

(c) As soon as the ship in distress hears this repetition she should endeavor to establish communication with the repeating Coastal station. If a *Neutral* Coastal station only is heard in reply, the ship in distress is to revert to normal international procedure, using her *International Call Sign* and giving her name. The compromise of her War Radio Call Sign in these circumstances is to be accepted.

(d) Numerous United States operated high frequency radio direction finding stations throughout the world maintain a continuous listening radio watch on the frequency of 8280 kcs, which has been designated as an emergency and safety frequency for certain U. S. military safety operations. While these stations are not equipped to acknowledge receipt of distress messages in all cases, such messages will be immediately relayed to the appropriate operational authority for action. If any vessel is unable to establish communication with any shore radio station on medium frequency or on the appropriate high frequency (see current effective issue of **IRPL** M series and/or Supplement M.350 series of Frequency Guides), the distress message should be broadcast on 8280 kcs.

ARTICLE 147

Form of Distress Messages

(a) **Components.** A distress message must contain the following components in the order given:

(1) The Distress Signal (see paragraph (b)).

(2) The letters "DE" followed by the *War Radio Call Sign* of the transmitting ship made three times.

(3) The ship's position (see paragraph (c)).

(4) The nature of the attack or distress, or enemy forces sighted (see paragraph (d)).

(5) Weather report (where practicable) (see Article 136).

(6) Time of Origin (if time and circumstances permit).

(b) **Types of Distress.** The appropriate Distress Signal is to be sent, using one of the following five types of distress:

CLASS OF DISTRESS	DISTRESS SIGNAL	WHEN USED
Warship Raider	**R R R R** (separate letters mode 3 times)	On sighting or when attacked by an enemy warship
Armed Merchant Ship Raider	**Q Q Q Q** (separate letters mode 3 times)	On sighting or when attacked by an armed merchant ship raider.
Submarine or mine	**S S S S** (separate letters mode 3 times)	On sighting or when attacked by a submarine or on striking a mine.
Aircraft	**A A A A** (separate letters mode 3 times)	When attacked by aircraft.
International	**S O S** (separate letters mode 3 times)	When in distress and immediate danger from causes not due to enemy action.

(c) **Report of Ship's Position.** A Distress Message which does not include an accurate report of position may be valueless. A ship at sea sailing independently and in distress is to express its position in:

(1) Latitude and longitude, or

(2) True bearing and distance in nautical miles from a well known geographical point.

(3) *Examples:* Position: Latitude 5° 13' N. Longitude 38° 15' W. is transmitted as:

0513 North 3815 West

Position of a ship bearing 93° true from Cape Hatteras and 410 nautical miles from that point is transmitted as follows:

093 410 miles Cape Hatteras

(d) **Nature of the Attack or Distress:** The nature of the attack or distress is to be expressed by one of the following words.

(1) Bombed

(2) Gunned

(3) Mined

(4) Torpedoed*

(5) Suspicious—Only to be used by a ship which suspects a surface vessel of hostile intentions.

(6) "Submarine on Surface" or "Periscope"—Only to be used by a ship which *sights* a submarine but which has not been attacked.

(7) Indication of distress not caused by enemy action, e.g., Iceberg, Collision.

(8) When a ship equipped with net defence has a torpedo caught or exploded in its net, a normal "SSSS" distress message should be made, with the nature of attack denoted as "Torpedoed". An amplifying message may be made in code, giving full details. (It is undesirable to send a message in plain language, because, if intercepted by the submarine, a second torpedo would probably be fired.)

* An independently routed merchant ship, if torpedoed between dusk and dawn (in addition to broadcasting a distress signal by radio, if out in a position to do so) is to fire at least TWO WHITE ROCKETS or ROMAN CANDLES (see WIMS Volume I, Art. 77). This visual signal in good visibility will serve to warn other merchant ships as well as escorts and aircraft in the vicinity, and provides a means, if the radio equipment has been put out of action, whereby a ship in distress can attempt to obtain assistance. *Masters of independent merchant ships are warned to turn away immediately on sighting this signal.*

ARTICLE 148

Examples of Distress Messages

(a) Example—**DISTRESS DUE TO A WARSHIP RAIDER.**

(1) On **sighting** an enemy naval ship (surface craft)

TRANSMIT	MEANING
CT	Attention
RRRR RRRR RRRR	Warship raider
DE	From
KHFD KHFD KHFD	Your own War Radio Call Sign (3 times)
0330 S 1850 W	Position: Lat. 03° 30' S.; Long. 18° 50' W.
SUSPICIOUS	Indicates presence of suspicious and unidentified warship
Two 4-figure groups	Weather report (if it is considered of importance)
081430Z	Time of Origin (if time permits)
AR	End of message

(2) On **being attacked** by an enemy naval ship (surface craft)

TRANSMIT	MEANING
CT	Attention
RRRR RRRR RRRR	Warship raider
DE	From
KHFD KHFD KHFD	Your own War Radio Call Sign (3 times)
0330 S 1850 W	Position: Lat. 03° 30' S.; Long. 18° 50' W.
GUNNED	Nature of action or attack
Two 4-figure groups	Weather report (if it is considered of importance)
081455Z	Time of Origin (if time permits)
AR	End of message

(b) Example—**DISTRESS DUE TO AN ARMED MERCHANT SHIP RAIDER**

(1) On **sighting** a suspicious merchant ship believed to be a disguised raider

TRANSMIT	MEANING
CT	Attention
QQQQ QQQQ QQQQ	Armed merchant ship raider
DE	From
ZLOB ZLOB ZLOB	Your own War Radio Call Sign (3 times)
1255 N 14804 E	Position: Lat. 12° 55' N.; Long. 148° 04' E.
SUSPICIOUS	Indicates presence of suspicious and unidentified merchant ship, apparently hostile
Two 4-figure groups	Weather report (if it is considered of importance)
271430Z	Time of Origin (if time permits)
AR	End of message

(2) When **attacked** by an armed merchant ship raider

TRANSMIT	MEANING
CT	Attention
QQQQ QQQQ QQQQ	Armed merchant ship raider
DE	From
ZLOB ZLOB ZLOB	Your own War Radio Call Sign (3 times)
0819 N 3216 W	Position: Lat. 08° 19' N.; Long. 32° 16' W.
GUNNED	Nature of attack
Two 4-figure groups	Weather report (if it is considered of importance)
271450Z	Time of Origin (if time permits)
AR	End of message

DISTRESS MESSAGES BY SHIPS OUT OF CONVOY

(c) Example—**DISTRESS DUE TO SUBMARINE OR MINE**

(1) When **sighting** a submarine

TRANSMIT	MEANING
CT	Attention
SSSS SSSS SSSS	Submarine
DE	From
KRAX KRAX KRAX	Your own War Radio Call Sign (3 times)
2004 N 2658 W	Position: Lat. 20° 04' N.; Long. 26° 58' W.
PERISCOPE	Indicates periscope has been sighted
Two 4-figure groups	Weather report (if it is considered of importance)
181420Z	Time of Origin (if time permits)
AR	End of message

(2) When **attacked** by a submarine

TRANSMIT	MEANING
CT	Attention
SSSS SSSS SSSS	Submarine
DE	From
KRAX KRAX KRAX	Your own War Radio Call Sign (3 times)
2004 N 2658 W	Position: Lat. 20° 04' N.; Long. 26° 58' W.
TORPEDOED	Nature of attack
Two 4-figure groups	Weather report (if it is considered of importance)
181445Z	Time of Origin (if time permits)
AR	End of message

(3) On **striking** a mine

TRANSMIT	MEANING
CT	Attention
SSSS SSSS SSSS	Mine
DE	From
KRAX KRAX KRAX	Your own War Radio Call Sign (3 times)
3840 N 7450 W	Position: Lat. 38° 40' N.; Long. 74° 50' W.
MINED	Nature of distress
Two 4-figure groups	Weather report (if it is considered of importance)
191621Z	Time of Origin (if time permits)
AR	End of message

(d) Example—**DISTRESS DUE TO ATTACK BY ENEMY AIRCRAFT**

TRANSMIT	MEANING
CT	Attention
AAAA AAAA AAAA	Enemy aircraft
DE	From
ZICG ZICG ZICG	Your own War Radio Call Sign (3 times)
6205 N 2811 W	Position: Lat. 62° 05' N.; Long. 28° 11' W.
Two 4-figure groups	Weather report (if it is considered of importance) to be included for benefit of aircraft which may be sent to assistance.
061120Z	Time of Origin (if time permits)
AR	End of message

(e) Example—**DISTRESS DUE TO CAUSES UNCONNECTED WITH THE ENEMY**

TRANSMIT	MEANING
CT	Attention
SOS SOS SOS	Distress Signal
DE	From
ZGOX ZGOX ZGOX	Your own War Radio Call Sign (3 times)
1904 N 5812 W	Position: Lat. 19° 04' N., Long. 50° 12' W.
FIRE IN HOLD OUT OF CONTROL. NEED IMMEDIATE ASSISTANCE	Nature of distress
Two 4-figure groups	Weather report (if it is considered of importance)
162340Z	Time of Origin (if time permits)
AR	End of message

NOTE: An "SOS" message is only to be used when the ship is in very serious danger and requires immediate assistance from distress due to marine causes. In less grave circumstances the message should take the form laid down in Article 117, paragraph (b).

CHAPTER 15

DISTRESS MESSAGES BY SHIPS OUT OF CONVOY

ARTICLE 149

Request for Air Protection

(a) In certain cases merchant ships sailing independently are given code words to be used when air protection is provided. The Distress Message in case of air attack is then to be made in the following form:

The word "**HELP**" is to be sent in plain language followed by the code word. The position of the ship is not to be included in this form of distress message. Full details of the areas in which air protection is effective are given to the ships concerned by Naval Authorities prior to sailing. Outside of these areas normal aircraft distress (AAAA) procedure is to be used.

Example: "SS PATHFINDER," an independently routed ship, is attacked by aircraft. Having been issued with the code word "CONGRESS" and being in a coastal area where air cover is provided, "SS PATHFINDER" makes:

HELP CONGRESS

ARTICLE 150

Jamming of Distress Messages

(a) The enemy is known to attempt to jam Distress Messages. A ship making a Distress Message on 500 kcs which is jammed should, if fitted with an H/F transmitter, immediately attempt to pass the message on the most suitable H/F wave. Details of both British and U. S. stations maintaining watch on H/F are contained in Appendix F.

(b) A ship which is being jammed on 500 kcs should, if not fitted with a "*SWAT*" unit (see Article 151), alter her tuning slightly and repeat her message; but this alteration should not be made during the actual transmission.

(c) After the first transmission of the Distress Message, the auto-alarm signal should be made, followed by two additional transmissions of the message, ~~irrespective of whether the ship is outside or inside a specified single-operator period~~.

(d) A ship whose message is being jammed should, if communication with a shore station has been established, report (in code if time permits) giving her position and, where possible, a D/F bearing of the enemy transmitter and the signal strength of the jamming signal(s).

(c) Example—**REPORT OF JAMMING, TRANSMITTING IN CODE TO RADIO AMAGANSETT (WSL) on H/F:**

TRANSMIT	MEANING
CT	Attention
XXX XXX XXX	Urgency signal
WSL WSL WSL	Call sign of shore station
DE	From
NUMS 6	General Radio Call Sign from any United Nations merchant ship
BT	Break sign
CDE 5	Number of code groups in message
BT	Break sign
5 coded groups	WMUG strength four Jamming at 161730Z on 500 kcs x 4115 North 0943 West x Bearing 093
BT	Break sign
161745Z	Date and Time of Origin of message
AR	End of message

(f) Any merchant ship which hears deliberate jamming of a Distress Message should attempt to obtain a D/F bearing, and should then send a radio report in code, preceded by the Urgency Signal **"XXX XXX XXX"** giving the time at which the jamming was heard, the D/F bearing of the enemy, her own position, the strength of the jamming signals, and any fragments of the original Distress Message which can be read through the jamming.

Swinging Wavelength Attachment to Transmitters—Short Title—"SWAT"

ARTICLE 151

(a) A small device for automatically varying the wave frequency emitted during the transmission of a Distress Message on medium frequency is being installed in certain British ocean-going merchant ships fitted with valve transmitters. This device is known as the "Swinging Wavelength Attachment to Transmitters" ("SWAT"). The "SWAT" unit is only fitted in cases where a ship carries separate main and emergency transmitters in the main Radio Office.

(b) The switching of the "SWAT" unit into circuit will cause the wave frequency of the main transmitter to swing slowly from 500 kcs to about 400 kcs and back again, the complete cycle taking approximately two min-

ures. At the same time the emergency transmitter is keyed for a simultaneous transmission on a steady frequency of 500 kcs.

(c) In ships fitted with the unit, great care must be taken after switching it off to insure that the tuning of the main transmitter is restored to 500 kcs by hand without delay.

(d) The "SWAT" unit should only be employed for transmitting a Distress Message when deliberate jamming is taking place. Listening ships which suspect jamming should search between 500 kcs and 400 kcs in an endeavor to pick up the "swatted" transmission and, if they are successful, should keep their receivers in tune with it until the complete Distress Message has been read. If, after a brief search, however, no signal can be found, listening ships should return to 500 kcs.

ARTICLE 152

Amplifying a Distress Message

(a) A Distress Message must be followed as soon as possible by a further message or messages giving details which are likely to be of value to the Naval authorities and to any warship coming to the assistance of the ship in distress. Such messages are called Amplifying Reports.

(b) If, as a result of communication with a Coastal station has been established, direct working is to be adopted and an Amplifying Report passed on 500 kcs.

(c) If communication has not been established with a shore radio station, Amplifying Reports are to be addressed to "Any United Nations' Warships" (UNWS) and are to be broadcast twice through on the same frequency(ies) as the original Distress Message (500 kcs and H/F where applicable).

(d) All Amplifying Reports should be preceded by the Urgency Signal "XXX XXX XXX", the *War Radio Call Sign* being used in plain language reports and the *General Radio Call Sign* procedure for reports in code. The Time of Origin of the message is to be included in every Amplifying Report transmitted.

(e) There are two types of Amplifying Reports, namely:

(1) Plain language Amplifying Reports made while the ship in distress is in contact with the enemy or, if a ship has been in action, immediately the action is terminated to report the fact. A plain language Amplifying Report is also permissible if a ship has lost contact with the enemy and time does not permit coding up the message.

(2) Coded Amplifying Reports made some time after contact with the enemy has been lost. (But see paragraph (1) on preceding page.)

(f) As many *plain language Amplifying Reports* should be made as are necessary; they should contain the fullest possible description of the hostile craft in order that prompt and certain action may be taken by any United Nations' warships in the vicinity. The position of the ship in distress (even though it was given in the original Distress Message) should be included. The importance of insuring that the position is accurate is emphasized. If the ship is about to be abandoned and time permits, the land for which it is intended to make should be reported.

(g) If and when contact with the enemy is lost, a *coded Amplifying Report* should be made, if circumstances permit, within an hour (or as soon afterwards as it is considered safe to do so) giving

(1) A brief summary of the situation and verifying the plain language report, e.g., "No damage"; "On fire and stopped"; "Speed reduced to eight knots", etc.

(2) The position should again be given and the course and speed of the transmitting ship.

(3) Further information of the enemy's movements, e.g. "Have lost sight of raider to north-east".

(4) Details of any actual encounter with the enemy.

(5) A weather report, if considered of importance and assistance.

Note: When making a *coded* Amplifying Report of enemy surface craft use should be made of the "Merchant Ship Description Code" (B.R.799) if held. Full instructions regarding the use of this code are contained in the primer supplied with it.

ARTICLE 153

Examples of Amplifying Reports:

(a) Amplifying Report sent on 500 kcs in *plain language* to supplement an initial Distress Message due to attack by an armed merchant ship raider; transmitted to Radio Freetown (VPU), contact having been established as a result of the Distress Message:

TRANSMIT	MEANING
CT	Attention
XXX XXX XXX	Urgency signal
VPU VPU VPU	Call sign of shore radio station
DE	From
ZLOB ZLOB ZLOB	Your own War Radio Call Sign (3 times)
BT	Break sign
My 271456Z	Reference to previous Distress Message (if has contained a date and time group being included in original Distress Message)
0837 N 2212 W	Position: Lat. 08° 17' N.; Long. 22° 12' W. (Present position)
BEING CHASED TO SOUTH EAST AND GUNNED BY ONE ARMED MERCHANT SHIP RAIDER	Details of enemy forces and nature of distress
Two 4-figure groups	Weather report (if it is considered of importance)
BT	Break sign
271515Z	Time of Origin
AR	End of message

(b) Amplifying Report sent in code to supplement previous plain language report and initial Distress Message; transmitted to Radio Freetown (VPU) with whom contact has been established:

TRANSMIT	MEANING
CT	Attention
XXX XXX XXX	Urgency signal
VPU VPU VPU	Call sign of shore radio station
DE	From
NUMSS NUMSS NUMSS	General Call Sign of any United Nations merchant ship
BT	Break sign
CDE31	Number of coded groups in message
BT	Break sign
31 coded groups	Your War Radio Call Sign coded My 271515Z (Time of Origin of previous plain language Amplifying Report). Undamaged. Enemy armed merchant ship last sighted steering approximately 350° from position 0811 N., 3207 W., at 16 knots at 1535Z My position 0806 N., 3156 W., course 135° speed 15 knots.
Two 4-figure groups	Weather report (if considered important)
BT	Break sign
271627Z	Time of Origin
AR	End of message

Cancelling a Distress Message

ARTICLE 154

(a) If after sending a Distress Message the alarm should prove to be false (or the ship finds she is not in need of immediate assistance) the message is to be cancelled at once, the cancellation being transmitted on the same frequency(ies) as were used for the original Distress Message (500 kcs and H/F where applicable). This cancellation is to be made in *plain language*, using the ship's *War Radio Call Sign*.

(b) Where communication with a shore station was not established on transmitting the Distress Message, the cancellation is to be addressed to "Any United Nations' Warships" (UNWS) and *broadcast twice through* on 500 kcs.

(c) A Distress Message made in error must be cancelled immediately. Failure to do so leads to useless and unnecessary movements of Naval Forces and leaves the Naval Authorities with misleading information.

(d) It is possible, however, that enemy ships in the vicinity may attempt to cancel a Distress Message in the hope of attacking the ship or, alternatively the actual enemy vessel reported in the message may attempt to cancel the report. To provide a check on the authenticity of the cancellation, therefore, a second report is to be made in code about (but not exactly) an hour after the first, repeating the cancellation but in a paraphrased form, to hinder the enemy comparing the plain language version with the coded message. This second report is to be preceded by the Urgency Signal "XXX XXX XXX" and the General Radio Call Sign procedure should be used.

(e) The procedure for cancelling Distress Messages made in error is to apply equally for all reports of distress, i.e., to reports of enemy submarines and aircraft as much as to armed merchant ship raiders and enemy warships. The only exception occurs in the case of ships of inferior speed which may have escaped in fog or under cover of darkness. In these circumstances they should only report their escape if fitted with H/F transmitters, and then only after a lapse of 24 hours from the time of the attack, when well clear of the area in which it occurred.

ANNEX 155

Examples of Cancellation Reports

(a) Cancellation Report sent on 500 kcs in *plain language* to cancel initial Distress Message reporting the sighting of a periscope and broadcast to "UNWS" as contact has not been established with a shore station.

TRANSMIT	MEANING
CT	Attention
UNWS UNWS UNWS	Any United Nations' warships (Contact not having been established with a shore station as a result of the initial Distress Message)
DE	From
KRAX KRAX KRAX	Your own War Radio Call Sign (3 times)
My 181420Z	Time of Origin of initial Distress Message if time permitted this to be sent
CANCEL SSSS CANCEL SSSS MADE IN ERROR	Cancel Distress Signal
Two 4-figure groups	Weather report (if not previously made)
181430Z	Time of Origin
AR	End of message

(b) Cancellation Report sent *in code* (to provide a check on authenticity of plain language cancellation; to be transmitted about (but not exactly) an hour after the first cancellation on the same frequencies).

TRANSMIT	MEANING
CT	Attention
XXX XXX XXX	Urgency Signal
UNWS UNWS UNWS	Any United Nations' warships
DE	From
NUMS9 NUMS9 NUMS9	General Call Sign of Any United Nations' merchant ships
BT	Break sign
CDE7	Number of coded groups in message
BT	Break sign
7 coded groups	Your War Radio Call Sign coded. Cancel SSSS made in error in My 181420Z (If date and time group was included in the Distress Message)
Two 4-figure groups	Weather report if not previously made
BT	Break sign
0824372	Time of Origin
AR	End of message

Relaying an Intercepted Distress Message

ARTICLE 156

(a) The Radio Officer of a merchant ship who intercepts a Distress Message is:

(1) To report the message to the bridge without delay.

(2) To inform the bridge if or when a shore station or other ship is heard to answer or repeat the message.

(3) To keep the bridge informed of any subsequent traffic in connection with the distress.

(b) Every effort should be made to obtain a D/F bearing of any Distress Message heard, and the importance of so doing if the signal emanates from an *automatic transmitter* is emphasized. Such a transmission will most probably be coming from a ship's lifeboat containing survivors from an abandoned or sunk ship or from the crew of an aircraft adrift in a dinghy; but the possibility that it might also be coming from an enemy ship attempting to lure merchant ships into her vicinity must not be overlooked.

(c) If no Coastal station is heard to repeat a Distress Message which has been broadcast by a ship, the Master of the intercepting ship should

order any such message, other than an automatic Distress Signal to be rebroadcast on 500 kcs (600 meters), unless he considers that the position of his own ship, in conjunction with the type of attack reported, would make the breaking of radio silence dangerous to his own ship's safety.

(d) A ship which relays a Distress Message should also relay any Amplifying Reports which may subsequently be intercepted (unless a Coastal station is heard to do so), provided that the Master is satisfied that no undue risk to his own ship will be incurred. Plain language and coded cancellation messages intercepted are similarly to be relayed.

(e) If fitted for H/F transmission, Distress Messages relayed on 500 kcs should also be relayed on the most suitable H/F wave (see Appendix N), in which case endeavor should be made to obtain an acknowledgment from a shore station. In certain circumstances it should be possible to relay the message on H/F even though the breaking of silence on 500 kcs is considered inadvisable.

(f) When a Distress Message or an Amplifying or Cancellation Report in plain language or code is relayed, it is to be *broadcast three times* exactly in the form received, and is to conclude with the "break sign" followed by the War Radio Call Sign of the relaying ship and a *Time Group*. *This Time Group is to be the time at which the message was first heard*. These additions will make it clear to all concerned that the ship transmitting is not the ship in distress.

(g) *Example:*

S.S. "Benefactor" with War Radio Call Sign WXYZ, an independently routed ship, intercepts a Distress Message. No Coastal station is heard to repeat it and the Master, after due consideration to the circumstances, decides to relay the message. S.S. "Benefactor" makes:

$\overline{CT}$ QQQQ QQQQ QQQQ DE WABC 5650N 1121W

SUSPICIOUS (whole message to be repeated three times)

$\overline{BT}$ WXYZ 161640Z $\overline{AR}$

(h) Intercepted *automatic* Distress Signals from lifeboats are *not* to be relayed and the Master must use his discretion as regards breaking silence to report their interception to the Naval Authorities.

ARTICLE 157 Use of the International Distress Signal—"SOS"

(a) The International Distress Signal "SOS" is only to be used for summoning assistance in cases of great urgency when in distress due to

normal marine causes, e.g., when the ship making the call is in imminent danger of foundering. It is emphasized that this form of message may well bring hostile forces to the scene in the hope of sinking the transmitting ship, and the employment of the International Distress Signal is obviously most undesirable except where the ship is in very grave peril.

(b) In less grave circumstances, when help is required for reasons unconnected with enemy action and the need is not urgent, an ordinary coded radio message (see Article 137) will provide the shore authorities with all necessary information to enable assistance to be sent, without divulging to the enemy any information that would be of value.

(c) An "SOS" message must include the War Radio Call Sign of the ship in distress and give her position and an indication of the nature of the distress in plain language. In no circumstances is the ship's name to be used in conjunction with the War Radio Call Sign.

CHAPTER 16

"Gulf, sir, not golf."

TRANSMISSION OF RADIO MESSAGES TO SHIPS OUT OF CONVOY.

PAGE 12A ORIGINAL

ARTICLE 161

Transmission of Radio Messages to Ships

(a) To guard against a merchant ship out of convoy acting on bogus messages transmitted by the enemy (see Article 20), the following information is given to enable ships to recognize the form and authenticity of messages transmitted by United Nations' Authorities.

ARTICLE 162

Diversion Messages

(a) Should it become necessary, for her own protection, to divert a merchant ship sailing independently from her established route, a Diversion Message will be transmitted by the Naval Authorities ashore on the BAMS organization. The ship will be addressed by her *War Radio Call Sign* and the message will be coded appropriately and transmitted in the form laid down in "WIMS", Vol. 1. If the ship is known to have straggled from her convoy the diversion message will be addressed to the ship's *War Radio Call Sign* or the *Convoy Straggler's Call Sign*.

(b) It is of vital importance that a Diversion Message be received correctly. The Master of a ship which misses or is unable to decode any part of a message, which he has reason to believe affects his Route Instructions, should give careful consideration to the advisability of breaking radio silence to request a repetition if he is equipped with a H/F transmitter. (See Article 132.)

ARTICLE 163

Air Raid Warning

(a) To indicate to merchant ships in certain coastal areas that an attack by aircraft is imminent, a "RED" warning will be issued. "RED" warnings will be broadcast only if one or more hostile aircraft are approaching the area, or if two or more unidentified aircraft are approaching simultaneously.

(b) "RED" warnings will be cancelled by "WHITE" messages when the danger of attack appears to have passed.

(c) Both "RED" warnings and "WHITE" messages will be transmitted on 500 kcs (W/T) and 1,650 kcs (R/T) by Coastal station(s) in the area(s) concerned. The "RED" warning, when transmitted on 500 kcs, will be preceded by the auto-alarm signal, and will be repeated three minutes later *without* the auto-alarm signal.

(d) Form of transmission:

(1) On 500 kcs (600 meters)

Auto-alarm signal $\overline{\text{CT}}$ CQ CQ CQ DE GKZ $\overline{\text{BT}}$ RED HUMBER $\overline{\text{BT}}$

Time of Origin $\overline{\text{AR}}$

followed approximately three minutes later by

$\overline{\text{CT}}$ CQ CQ CQ DE GKZ $\overline{\text{BT}}$ RED HUMBER $\overline{\text{BT}}$ Time of Origin $\overline{\text{AR}}$

~~(b) On 1,650 kcs (181.8 meters)~~

HELLO ALL STATIONS THIS IS NUMBER RADIO (twice)

RED NUMBER Time of Origin (twice)

(3) "WHITE" messages will be broadcast in the same form but without the preliminary auto-alarm signal.

Note: This procedure is at present in force in U.K. waters only. The map on page 126a shows the limits of the areas to which individual "RED" messages may be applied.

A modified form of Sea Air Raid Warning is also in force in BAMS Area 7. (See Appendix A).

ARTICLE 164

Requests from Air Escorts for D/F Bearings

(a) When D/F bearings are required by aircraft sent to escort independently routed merchant ships, to assist such aircraft to locate the ship to be escorted, a coded message will be sent to the ship concerned on the BAMS organization in the following form:

EXPECT AIR ESCORT ABOUT ..... G.M.T. SET D/F

WATCH ON 385 KCS (780 METERS) FROM.....G.M.T.

(b) From the time given in the signal, the ship is to keep D/F watch for two minutes, commencing every exact five minutes, on a frequency of 385 kcs (780 meters) until the aircraft is sighted, or until two hours have passed since the expected time of arrival of the aircraft.

(c) An aircraft which requires a bearing will transmit its call sign for two minutes on 385 kcs at one of the times stated above. The ship is then to break radio silence and transmit her *War Radio Call Sign* on 375 kcs (800 meters) and give the D/F bearing of the aircraft. The direction of the D/F bearing given should be from ship to aircraft. The ordinary "Q" operating signals are to be employed.

(d) *The call sign of the aircraft will be the War Radio Call Sign of the merchant ship followed by the letter "A". Relieving aircraft will use the War Radio Call Sign of the merchant ship followed by "A1", "A2", etc., in numerical order of reliefs.*

(e) It is of the greatest importance that the "SENSE" of the bearing is determined, but if this cannot be done, both the bearing and the reciprocal should be passed to the aircraft which, in order to ascertain on which side of the ship it is, will then fly at right angles to the bearing given and obtain a further bearing.

Navigational Warnings

ARTICLE 165

(a) In addition to the series of plain language *HYDROLANT* and *NAVEAM* navigational warnings (see Article 68), passed to ships sailing in the North and South Atlantic and the Mediterranean, timely warnings of the proximity to danger may be passed to ships in certain coastal waters where it is possible to keep track of ships by means of radiolocation.

(b) On receipt of such a warning, the assumed position of the ship should be most carefully reviewed in the light of the warning signal.

(c) Navigational warnings referring to coastal routes transmitted by foreign radio stations should be treated with reserve and disregarded unless the Master is convinced they emanate from United Nations' Authorities.

U-Boats—Reports on Position

ARTICLE 166

(a) When the position of a U-Boat is known with sufficient accuracy, a message will be broadcast by British stations giving the position in the following form:

Reference Admiralty Message 'AF'

Position 48° 35′ N., 12° 16′ W.

(b) This message will normally be made in plain language and will be broadcast by R/T in addition to radio telegraph where R/T facilities exist. Such a position should be avoided for twelve hours from the Time of Origin of the message, after which time it should be assumed that the U-Boat has moved. No further attention is then to be paid to the message.

(c) The words "*Admiralty Message 'AF'*" are only to be regarded as the code word for a U-boat warning and do not possess any other significance.

(d) Admiralty "AF message procedure" is not normally in effect in Pacific waters.

Transmission of Special Weather Forecasts

ARTICLE 167

Certain radio stations transmit special weather forecasts. These are only intended for such ships as have been supplied with a special meteorological code, and are to be disregarded by all other merchant shipping.

Radio Time Signals

ARTICLE 168

(a) Standard time signals are transmitted from certain United Nations' shore stations, and details of the times, call signs and frequencies used are contained in Appendix C. These time signals are sufficiently accurate for chronometer rating and ordinary use.

(b) Certain Coastal stations transmit time signals on 500 kcs primarily for the use of survivors in lifeboats. The signals are accurate to within approximately one second, but should not be used for checking chronometers, etc., if standard time signals are available. Details of the times of emission and the stations concerned are given in Appendix C.

ARTICLE 169 B.B.C. Empire News Service

Full details of the programmes in the B. B. C. Empire Service are receivable in morse throughout the world in a 1,000 word message, transmitted every Sunday morning on British transmitters from 0700 to 0800 G. M. T.

GYBB	19,000 kcs	15.72 meters
GID	13,555 kcs	22.13 meters
GIH	10,650 kcs	28.17 meters
GAY	8,910 kcs	33.67 meters

ARTICLE 170 R/T Broadcasts for Small Craft

(a) To provide communications for small craft such as trawlers, etc., which are fitted with R/T only (or which do not carry a qualified officer for the performance of radio duties), and which do not normally move very far from the coast, a constant watch is kept by all *British Coastal stations* on a frequency of 1650 kcs (181.8 meters). Official messages to merchant ships of interest to such craft are broadcast in certain areas by radio-telephone in addition to radio-telegraph stations.

(b) Messages are broadcast at fixed times from the radio stations given in the appropriate tables (Appendix A). In general, the stations used are those from which navigational and gale warnings are broadcast for the information of local shipping in time of peace. The text of each message indicates the Naval Authority who has originated it, and contains, if necessary, details of the locality to which it refers.

(c) Example of the procedure used:

The station calls up:

"Hello All British and Allied merchant ships—This is Land's End Radio—here is a message from the Admiralty to you all. Begins. All ships reading this message should proceed to nearest port immediately (repetition of text)—(Time of Origin of message)—end."

● APPENDICES

Appendix A	BAMS Area Organization
Appendix B	Special Single and Two-Operator Watchkeeping Periods
Appendix C	Radio Time Signals
Appendix D	Receiver Combinations, D/F, and Auto Alarms Approved
Appendix E	D/F Calibration Facilities
Appendix F	British and U.S. Stations Keeping H.F Watches
Appendix G	Phonetic Alphabet
Appendix H	Instructions Governing the Use, Control, Supervision, Inspection or Closure of Radio Stations on Merchant Ships in U.S. Ports
Appendix I	Statutory Rules and Orders for British Controlled Ships Concerning Radio, Apparatus and Watchkeeping
Appendix J	"Non-Combat Areas."
Appendix K	~~Air Raid Warnings—Map of Areas~~
Appendix L	Conversion Table — Kilocycles per Second — Wavelength
Appendix M	Table of Letters Used to Indicate Time Zones
Appendix N	~~Frequency Guide~~

● Bams Area Organization

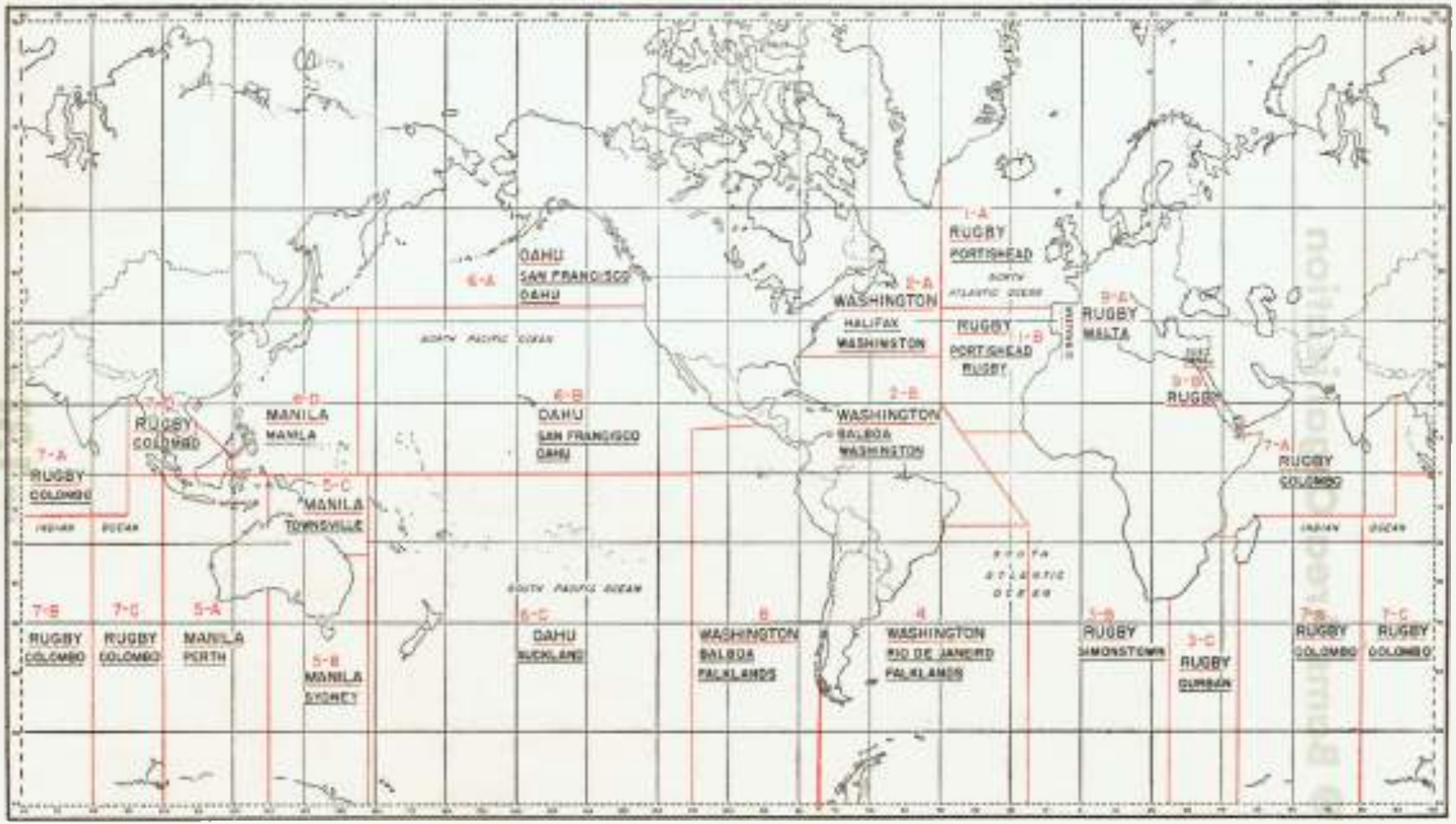
APPENDIX

A

DIAGRAM A

AREAS FOR BROADCASTS TO ALLIED MERCHANT SHIPS (BAMS)

Showing Zone Stations (underlined in red) and Area Stations (underlined in black)



AREA 1

AREA 1

LIMITS OF AREA 1

(a) Area 1 is divided into Areas 1A and 1B. The following are the limits of these areas:—

Area 1A. Northern limit—the North Pole.

Southern limit—the parallel of 43 degrees North.

Eastern limit —the coast of Europe to the meridian of 60 degrees East in the Arctic Ocean.

Western limit—the meridian of 40 degrees West

Area 1B. Northern limit—the parallel of 43 degrees North.

Southern limit—the parallel of 12 degrees North.

Eastern limit —the meridian of Gibraltar.

Western limit—the meridian of 40 degrees West.

ZONE AND AREA STATIONS IN AREA 1

(a) The following are the Zone and Area Stations in Area 1:—

Area 1A. Zone Station—Rugby.

Area Station—Portishead.

Area 1B. Zone Station—Rugby.

Area Stations—Portishead and Rugby

(b) The organization in Area 1 varies slightly from the standard organization in that Rugby acts as an Area Station in Area 1B as well as being Zone Station. In consequence, messages for ships in the area 861 can necessarily be broadcast at two consecutive routine periods from both Rugby and the other Area Station; but may only be broadcast at two consecutive routine periods.

DIRECTION FINDING ORGANIZATION

(a) Details of the stations participating in this service are given in Tables under Area 1A

(b) Diagram "D" shows the positions of Radio Stations and D/F stations in the British Isles.

(c) Stations listed in Tables 1A and 1B will give bearings using one-way procedure. (See International Telecommunications Conference Report, Cairo, 1938, and Radio Navigational Aids, N. O. No. 303.)

DIAGRAM 8

DIAGRAM SHOWING RADIO BNS. AND D/F STATIONS

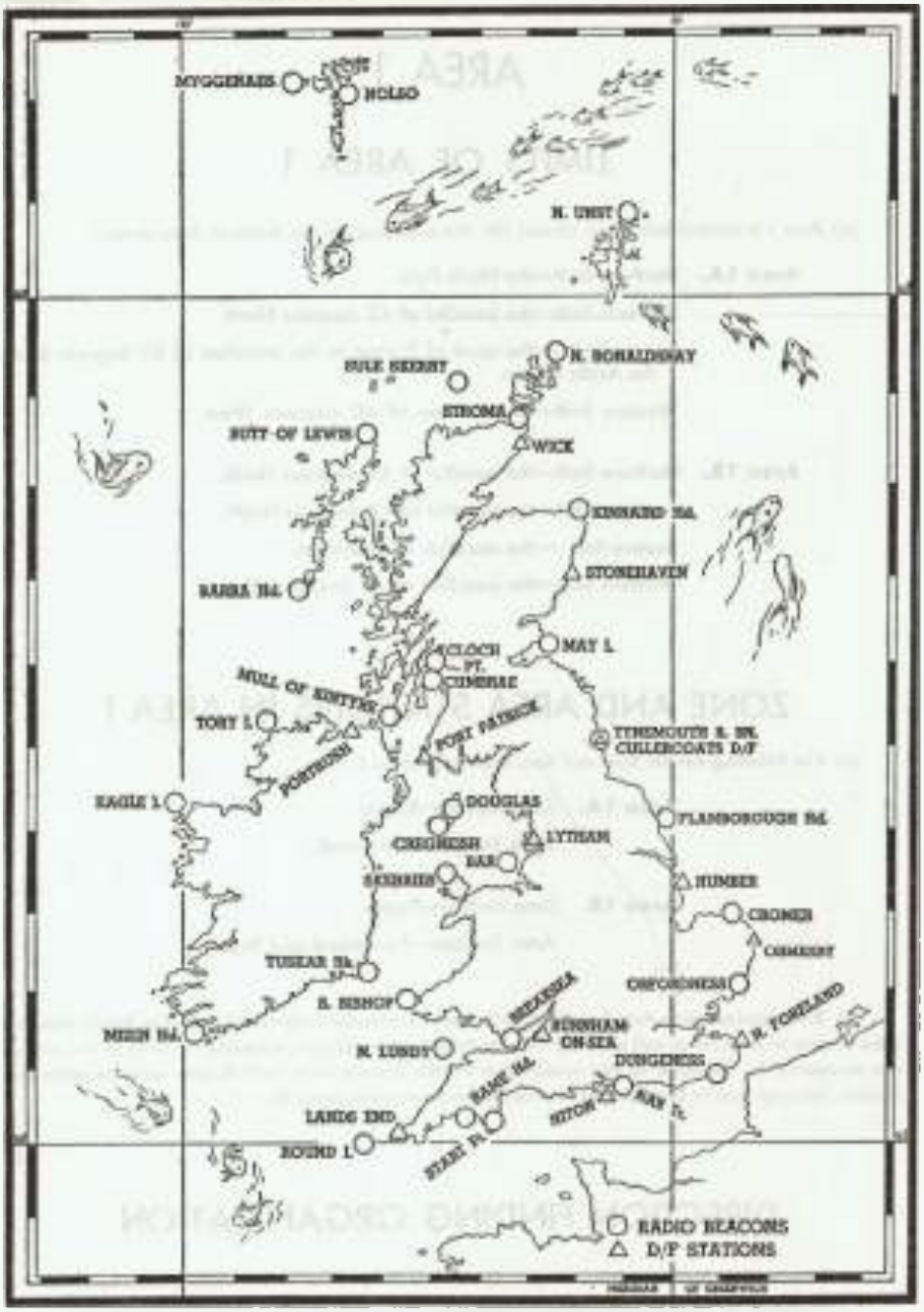


TABLE 11

COASTAL STATIONS

The stations given in this table maintain constant watch on 500 kcs, and are available for the transmission of "BAMS" messages on the working waves indicated.

(*Note.*—Each Coastal Station in the United Kingdom has been allotted a local area of operation. These areas are in no way associated with the "BAMS" Areas, but have been established in order to ensure that ships within range of the U.K. may be certain of the station with which they should communicate in case of necessity.) (See Diagram "C" for limits of local Areas.)

Line No. (for reference only).	(Col. 1) Radio Station.	(Col. 2) Call Sign.	(Col. 3) Working Wave.	
			Frequency (kcs).	Wavelength (metres).
1	Bordeaux	FFX	461	651
2	Boulogne	FFB	448	669.5
3	Brest	FUE	375	800
4	Burnham-on-Sea	GBL	476	630
5	Cherbourg	FUC	458	655
6	Cullercoats	GCC	484	620
7	Humber	GKZ	467	642
8	Land's End	GLD	438	683
9	Le Havre	FFY	436.5	687
10	Malin Head†	GMH	421	713
11	Niton	GNI	464	647
12	North Foreland	GNF	416	718
13	Ormsby*	MFOI	429	699
14	Portpatrick	GPK	461	651
15	Reykjavik	TFA	484	620
16	Seaforth	GLV	447	671
17	Stonehaven	GND	421	713
18	Valentia†	GCK	429	699
19	Wick	GKR	435	690

†These stations are situated in NEUTRAL territory, and may NOT be used for belligerent communications. They will handle distress traffic, however, but apart from this are available for commercial purposes only. Any communications with these stations must be conducted by normal international commercial procedure, using International Call Signs.

*This station has no definite area of operation.

DIAGRAM C

LOCAL AREAS OF AREA IA COVERED BY COASTAL STATIONS

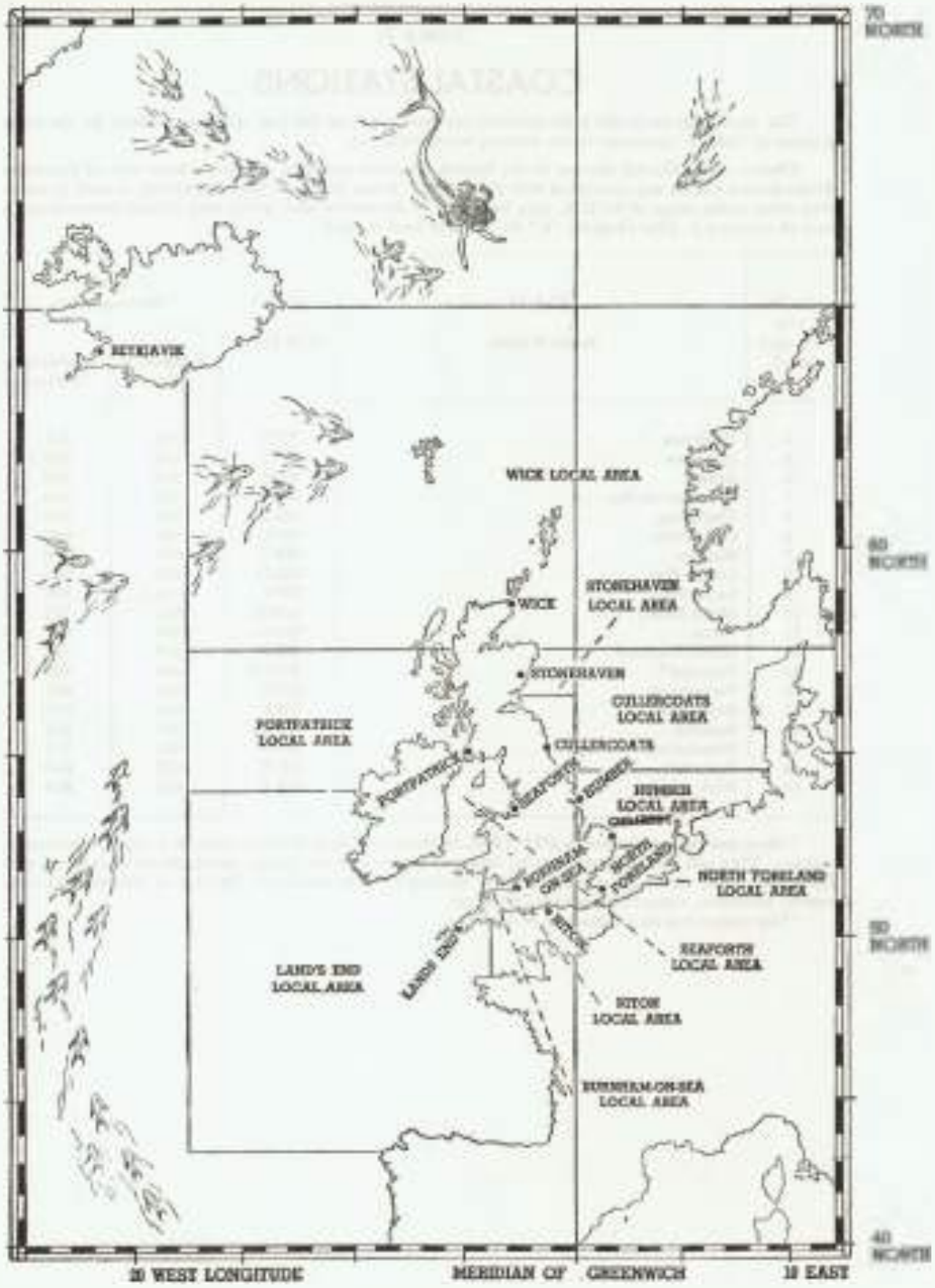


TABLE 11

"BAMS ROUTINES"

Line No. (for reference only).	(Col. 1) Radio Station from which messages will be sent.	(Col. 2) Call Sign.	(Col. 3) L/F Frequency (kcs).	(Col. 3) L/F Wave-length (meters).	(Col. 4) H/F Frequency (kcs).	(Col. 4) H/F Wave-length (meters).	(Col. 5) Time (G.M.T.).
1	Rugby	GBR	16	18,750			
2		GKU4			4,025	74.53	
3		GKU1			7,355	40.79	0000
4		GAY			8,910	33.67	
5		GKU	149	2,013			
6	Portishead	GKU	149	2,013			
7		GKU4			4,025	74.53	0200
8		GKU1			7,355	40.79	
9	Portishead	GKU	149	2,013			
10		GKU4			4,025	74.53	0600
11		GKU1			7,355	40.79	
12	Portishead	GKU	149	2,013			
13		GKU1			7,355	40.79	1000
14		GKU3			12,455	24.09	
15	Rugby	GBR	16	18,750			
16		GAY			8,910	33.67	
17		GID			13,555	22.13	
~~18~~		~~GYGP~~			~~15,960~~	~~18.80~~	1200
19		GYB8			19,080	15.72	
20		GKU	149	2,013			
21	Portishead	GKU	149	2,013			
22		GKU3			12,455	24.09	1415
23		GKU3			17,685	16.96	
24	Portishead	GKU	149	2,012			
25		GKU1			7,355	40.79	1800
26		GKU3			12,455	24.09	
27	Rugby	GBR	16	18,750			
28		GKU1			7,355	40.79	
29		GAY			8,910	33.67	
~~30~~		~~GIH~~ — GKU4			[illegible] ~~[illegible]~~	[illegible] ~~[illegible]~~	2000
~~31~~		~~GID~~			~~13,555~~	~~22.13~~	
~~32~~		~~GYC7~~			~~15,960~~	~~18.80~~	
33		GKU	149	2,013			
34	Portishead	GKU	149	2,013			
35		GKU4			4,025	74.53	2200
36		GKU1			7,355	40.79	

APPENDIX

A SAMS ORGANIZATION

AREA

1-A

TABLE 13

R/T BROADCAST ROUTINES

Line No. (for reference only).	(Col. 1) R/T Station.	(Col. 2) Frequency (kcs).	Wavelength (meters).	(Col. 3) Time (G.M.T.).
1	Cullercoats	1,845	162.6	
2	Humber	1,825	164.4	
3	Land's End	1,845	162.6	
4	Niton	1,825	164.4	0330
5	North Foreland	1,835	163.5	0930
6	Burnham-on-Sea	1,835	163.5	1530
7	Portpatrick	1,825	164.4	2030
8	Seaforth	1,845	162.6	
9	Stonehaven	1,825	164.4	
10	Wick	1,835	163.5	

TABLE 14

D/F STATIONS FROM WHICH BEARINGS MAY BE OBTAINED WITH THE STATIONS WORKING EITHER INDIVIDUALLY OR IN GROUPS

Note: Bearings are obtainable on 375 kcs (800 meters) or on 500 kcs (600 meters)

Line No. (for reference only).	(Col. 1) D/F Station.	(Col. 2) Position of Transmitting Aerial.	(Col. 3) Position of D/F Receiving Aerial.	(Col. 4) Call Sign.	(Col. 5) D/F Group.	(Col. 6) [illegible] (Controlling Stations in heavy type.)	(Col. 7) Group Call Sign.
1	Portrush		55° 10' 44" N. 06° 38' 54" W.	OHO	B	**Portrush**..... Portpatrick.	[illegible]
2	Portpatrick*§	[illegible]	[illegible]	[illegible]	—	—	—

* [illegible]

§ [illegible]

TABLE 15

D/F STATIONS FROM WHICH BEARINGS MAY BE OBTAINED INDIVIDUALLY BUT NOT IN GROUPS

[illegible]

Line No. (for reference only).	(Col. 1) D/F Station.	(Col. 2) Position of Transmitting Aerial.	(Col. 3) Position of Receiving Aerial.	(Col. 4) Call Sign	(Col. 5) Remarks.
1	Land's End	[illegible]	(A) 50° 0?' [illegible]" N. 0?° ?9' 3?" W.	GLD	The letter "A" or "B" will be sent to ships after the figures denoting the bearing to indicate on which aerials the bearing has been taken.
2			(B) 50° 07' 04" N. 05° 40' 44" W.		
3	North Foreland	51° 21' 3?" N. 01° 24' 5?" E.	(A) 51° 21' 18" N. 01° 25' 19" E.	GNF	
4			(B) 51° 21' 31" N. 01° 28' 50" E.		
5	Niton	[illegible]	50° 3?' 5?" N. 01° 1?' 59" W.	GNI	
6	Humber	53° 19' 43" N. 00° 16' 34" E.	53° ?9' 43" N. 00° 16' 5?" E.	GKZ	
7	Cullercoats	[illegible]	55° 02' 16" N. 01° 25' 30" W.	GCC	
8	Stonehaven	56° 56' 46" N. 02° 13' 30" W.	[illegible] 02° 1?' 39" W.	GND	
9	Burnham-on-Sea	—	[illegible]	GRL	
10	[illegible]	5?° 4?' 5?" N. 0?° 53' ?3" W.	[illegible]	GDY	
11	Wick	[illegible]	58° 25' 41" N. 03° 0?' 5?" W.	GKR	
12	Iceland	6?° 0?' 48" N. ?2° 4?' 48" W.	?1° 02' 4?" N. ?2° 4?' 4?" W.	[illegible]	Bearings from Iceland may be obtained on 385 kcs at any time. Merchant ships not tuned to 385 kcs may call on 500 kcs and will be ordered to transmit on 375 kcs, bearing being passed on 500 kcs. Ships must be careful to avoid jamming aircraft reporting to this station.
13	[illegible]	—	52° 40' 40" N. 0?° 4?' 34" E.	[illegible]	—

AREA 1-B

TABLE II

COASTAL STATIONS

The stations given in this table maintain constant watch on 500 kcs, and are available for the transmission of "BAMS" messages on the working waves indicated.

Line No. (for reference only).	(Col. 1) Radio Station.	(Col. 2) Call Sign.	(Col. 3) Working Wave.	
			Frequency (kcs).	Wavelength (meters).
1	Casablanca	CNM	477	628
2	Dakar	FUW	480	625
3	Gibraltar	GVW	470	638
4	Port Etienne	FGB	425	706

TABLE 1

AREA 1-B

"BAMS" ROUTINES

Line No. (for reference only).	(Col. 1) Radio Station from which messages will be sent.	(Col. 2) Call Sign.	(Col. 3) L/F Frequency (kcs).	(Col. 3) L/F Wavelength (meters).	(Col. 4) H/F Frequency (kcs).	(Col. 4) H/F Wavelength (meters).	(Col. 5) Time (G.M.T.).
1		GBR	16	18,750			
2		GKU4			4,025	74.53	
3	Rugby	GKU1			7,355	40.79	0000
4		GAY			8,910	33.67	
5		GKU	149	2,013			
6		GBR	16	18,750			
7		GKU	149	2,013			
8	Portishead	GKU4			4,025	74.53	0300
9		GKU1			7,355	40.79	
10		GBR	16	18,750			
11		GKU	149	2,013			
12	Portishead	GKU4			4,025	74.53	0600
13		GKU1			7,355	40.79	
14		GBR	16	18,750			
15		GKU	149	2,013			
16	Portishead	GKU1			7,355	40.79	1000
17		GKU3			12,455	24.09	
18		GBR	16	18,750			
19		GAY			8,910	33.67	
20	Rugby	GID			13,555	22.13	1200
21		GYC7			15,960	18.80	
22		GYE8			19,080	15.72	
23		GKU	149	2,013			
24		GBR	16	18,750			
25		GKU	149	2,013			
26	Portishead	GKU3			12,455	24.09	1413
27		GKU2			17,685	16.96	
28		GBR	16	18,750			
29		GKU	149	2,013			
30	Portishead	GKU1			7,355	40.79	1800
31		GKU3			12,455	24.09	
32		GBR	16	18,750			
33		GKU1			7,355	40.79	
34		GAY			8,910	33.67	
35	Rugby	GIH			10,650	28.17	2000
36		GID			13,555	22.13	
37		GYC7			15,960	18.80	
38		GKU	149	2,013			
39		GBR	16	18,750			
40		GKU	149	2,013			
41	Portishead	GKU4			4,025	74.53	2200
42		GKU1			7,355	40.79	

AREA 2

LIMITS OF AREA 2

(a) Area 2 is divided into Areas 2A and 2B. The following are the limits of these areas:—

Area 2A. Northern limit—the North Pole.
Southern limit—the parallel of 32 degrees North
Eastern limit—the meridian of 40 degrees West.
Western limit—the East coast of the North American continent.

Area 2B. Northern limit—the parallel of 32 degrees North.
Southern limit—the parallel of 15 degrees South.
Eastern limit—the meridian of 40 degrees West from latitude 32 degrees North to latitude 20 degrees North, thence direct to a position 15 degrees South and 15 degrees West.
Western limit—the East coast of the North and South American continents.

ZONE AND AREA STATIONS IN AREA 2

(a) The following are the Zone and Area Stations in Area 2:—

Area 2A. Zone Station —Washington.
Area Stations—Washington and Halifax.
Area 2B. Zone Station —Washington.
Area Stations—Washington and Balboa.

(b) The organization in Area 2 varies slightly from the standard organization in that Washington acts as an Area Station in both Areas 2A and 2B as well as being the Zone Station. Tr-ansmissions messages for ships in the area will not necessarily be broadcast at two consecutive routine periods from both Washington and the other Area Station but may only be broadcast at two consecutive routine periods shown in Tables 27 or 28.

DIRECTION FINDING ORGANIZATION

Area 2A [U. S. D/F Stations only]:

(a) Service is obtained by calling on 375 kcs (800 meters) stations will answer on the same frequency. All U. S. D/F stations are grouped with each group controlled by a Group Control Radio Station. Ships desiring service should initially call the Group Control Station who will answer for any or all stations comprising the group. Requests may be directed to individual stations on occasions when service from those stations only is desired. The call is to be made in the usual manner followed by the abbreviation "QTE."

(b) Ships are to use their War Radio Call Signs.

(c) When instructed to transmit, the calling ship should transmit a 10 second dash followed by the ship's War Radio Call Sign. This may be repeated as necessary upon direction of the D/F station. Sharp transmitter tuning on 375 kcs is important. Signal should be of medium strength; if necessary, the station will direct the ship to increase or decrease the power used.

(d) Bearing information will be furnished in the following order:

1. Abbreviation "QTE" followed by:

2. True bearing in degrees from the D/F station. (Poor bearings will be reported as "doubtful.")

3. Time of observation (GCT).

(e) As soon as the ship has received the result of the observation, it shall repeat the message to the Group Control Station, or in the case of requests made to individual stations, the D/F station. The latter shall then confirm the accuracy of the repetition or, when necessary, shall correct it by again repeating the message.

(f) Sector of Calibration: The sector of calibration of a D/F station is the sector since the receiving coil of the station in which the deviation of radio bearings is known. Sectors are measured clockwise from 0° (true north) to 360° and are given bearing from the station seaward. Bearings which do not fall within the sector of calibration of a station should be considered unreliable.

(g) U. S. D/F stations and their Group Control Stations guard the distress frequency (500 kcs/600 m) continuously.

APPENDIX

A

BAMS ORGANIZATION

AREA

2-A

TABLE I

COASTAL STATIONS

The stations given in this table maintain constant watch where indicated in Col. 2, and/or are available for the transmission of "BAMS" messages using call signs and working waves shown in Col. 3.

Line No. (for reference only).	(Col. 1) Radio Station.	(Col. 2) Station keeping constant watch on 500 kcs. Call Sign.	(Col. 3) Stations transmitting "BAMS" messages. Call Sign.	Working Wave: Frequency (kcs).	Working Wave: Wave length (meters).
1	Amagansett, N. Y.	WSL	WSL	474	633
2	Argentia, Newf.	NWP	—	—	—
3	Belle Isle	VCM	VCM	417	719
4	Bermuda	VRT	VRT	451	665
5	Boston, Mass.	NMF	NMF	421	706
6	Camperdown, N. S.	VCS	VCS	441	680
7	Canso, N. S.	VAX	VAX	417	719
8	Cape Race, Newf.	VCE	VCE	454	661
9	Charleston, S. C.	NMB	NMB	425	706
10	Fame Point	VCG	VCG	454	661
11	Father Point	VCF	VCF	484	620
12	Grindstone Island	VCN	VCN	454	661
13	New London	NOU	—	—	—
14	New York (East Moriches), N. Y.	NMY	—	—	—
15	Norfolk	NMN	NMN	410	732
16	North Sydney, N. S.	VCO	VCO	441	680
17	Philadelphia, Pa.	NMR	—	—	—
18	Quebec	VCC	VCC	441	680
19	Rockland, Me.	NOE	—	—	—
20	St. John's, N. B.	VAR	VAR	441	680
21	Yarmouth	VAU	VAU	417	719

TABLE II

"BAMS" ROUTINES

Line No. (for reference only).	(Col. 1) Radio Station from which messages will be sent.	(Col. 2) Call Sign.	(Col. 3) L/F: Frequency (kcs).	(Col. 3) L/F: Wave-length (meters).	(Col. 4) H/F: Frequency (kcs).	(Col. 4) H/F: Wave-length (meters).	(Col. 5) Time (G.M.T.).
1	Halifax	CFH2	111	2,703	8,490	35.33	0100
2	Washington	NSS	122	2,459	4,390	68.34	0500
3					9,425	31.83	
4					13,630	23.75	
5	Halifax	CFH2	111	2,703	8,490	35.33	0930
6	Washington	NSS	122	2,459	4,390	68.34	1100
7					9,425	31.83	
8					13,630	23.75	
9	Halifax	CFH2	111	2,703	12,500	24.00	1300
10	Washington	NSS	122	2,459	4,390	68.34	1700
11					9,425	31.83	
12					13,630	23.75	
13	Halifax	CFH2	111	2,703	12,500	24.00	2130
14	Washington	NSS	122	2,459	4,390	68.34	2300
15					9,425	31.83	
16					13,630	23.75	

TABLE III

R/T BROADCAST ROUTINES

Line No. (for reference only).	(Col. 1) R/T Station.	(Col. 2) Frequency (kcs).	(Col. 2) Wavelength (meters).	(Col. 3) Time (G.M.T.).
1	Louisburg	680	441.2	0900
2	Sambro Lightship	690	434.8	1210
3	Louisburg	680	441.2	1700
4	Sambro Lightship	690	434.8	1740

TABLE 22A

U. S. D/F STATIONS FROM WHICH BEARINGS MAY BE OBTAINED

(Note: [illegible])

Line No. (for reference only)	(Col. 1) D/F Station.	(Col. 2) Position of Receiving Loop.	(Col. 3) Call Sign.	(Col. 4) Sector of Calibration.
1	Boston (Marshfield), Mass. Group Control For:	. . . .	NMF*	
2	Winter Harbor, Maine	[illegible] N. [illegible] W.	[illegible]**	[illegible] and [illegible]
3	Cape Elizabeth (Portland), Maine	43° 33' [illegible] N. 70° 11' [illegible] W.	NAB	[illegible]
4	North Truro (Cape Cod), Mass.	42° 02' [illegible] N. 70° 03' [illegible] W.	NAE	[illegible]
5	Siasconset (Nantucket), Mass.	41° 14' [illegible] N. 70° 01' [illegible] W.	NBB	[illegible] and [illegible]
6	New York (East Moriches), N. Y. Group Control For:		NMY*	
7	Amagansett, L. I., N. Y.	[illegible] N. [illegible] W.	NBM**	[illegible]
8	Fire Island, N. Y.	[illegible] N. [illegible] W.	NJY	[illegible]
9	Cape May, N. J.	[illegible] N. [illegible] 54' [illegible] W.	NKC	[illegible]
10	Bethany Beach, Del.	[illegible] N. 75° 03' [illegible] W.	NBN	[illegible]
11	Norfolk (Oceana), Va. Group Control For:	. . . .	NMN*	
12	Virginia Beach, Va.	[illegible] 10" N. [illegible] 54" W.	NCZ	[illegible]
13	Poyners Hill, N. C.	[illegible] N. [illegible] W.	NHR**	[illegible]
14	Cape Hatteras, N. C.	[illegible] N. [illegible] W.	NDW	017° to 330°
15	Cape Lookout, N. C.	[illegible] N. [illegible] W.	NAH	[illegible]
16	Dupont, S. C.	[illegible] N. [illegible] W.	NHT**	[illegible]

* Note: Group control stations [illegible]

** Note: Calls to these stations will be answered by Group Control.

TABLE 2/B

AREA 2-A

CANADIAN DIF STATIONS FROM WHICH BEARINGS MAY BE OBTAINED

NOTE: All stations keep continuous watch on 500 kcs and will change to 375 kcs to give bearings after communication has been established on the former, except Resolution Island.

Line No. (for reference only).	(Col. 1) D/F Station.	(Col. 2) Position of Transmitting Aerial.	(Col. 3) Call Sign.	(Col. 4) Remarks.
1	St. John, N. B.	45° 15' 01" N. 66° 06' 47" W.	VAR	Positions of Transmitting and Receiving Aerials are so close together as to be considered identical.
2	Yarmouth, N. S.	43° 46' 24" N. 66° 07' 16" W.	VAU	
3	Camperdown, N. S.	44° 31' 13" N. 63° 33' 30" W.	VCS	
4	Canso, N. S.	45° 19' 11" N. 60° 58' 06" W.	VAX	
5	St. Paul Island*	47° 13' 15" N. 60° 08' 45" W.	VGS	
6	Cape Race	46° 39' 25" N. 53° 04' 15" W.	VCE	
7	Belle Isle**	51° 52' 51" N. 55° 21' 44" W.	VCM	
8	Resolution Island**†	61° 18' 30" N. 64° 53' 24" W.	VAW	
9	Cape Hopes Advance**	61° 05' 12" N. 69° 33' 24" W.	VAY	
10	Nottingham Island**	63° 06' 48" N. 77° 56' 18" W.	VCB	
11	Chesterfield Inlet**	63° 20' 05" N. 90° 43' 33" W.	VBZ	
12	Port Churchill**	58° 46' 32" N. 94° 10' 31" W.	VAP	

* Operates primarily as a beacon station. Continuous watch maintained on 500 kcs and beacon transmissions will be interrupted to give bearings.

** During navigational season only.

† Continuous watch on 500 kcs for establishing communication and taking bearings subsequently shifting to 375 kcs for passing in bearings.

APPENDIX

A

BAMS ORGANIZATION

AREA

2-B

TABLE 24

COASTAL STATIONS

The stations given in this table maintain constant watch where indicated in Col. 3, and are available for the transmission of "BAMS" messages using call signs and working wave-lengths shown in Cols. 3.

Line No. (for reference only).	(Col. 1) Radio Station.	(Col. 2) Stations keeping constant watch on 500 kcs. Call Sign.	(Col. 3) Stations transmitting "BAMS" messages. Call Sign.	Working Wave Frequency (kcs).	Working Wave Wave-length (meters).
1	Balboa, C. Z.	NBA	—	—	—
2	Barbados*	VPO	VPO	425.5	705
3	Belize	VPP	VPP	500	600
4	Bermuda*	VRT	VRT	451	665
5	Galveston	NOY	NOY	425	705
6	Guantanamo	NAW	NAW	106	2,830
7	Jacksonville	NMV	—	—	—
8	Kingston, Jamaica	VQI	VQI	460	652
9	Miami, Florida	WAX	WAX	483	633
10	Mobile	NOQ	NOQ	410	732
11	New Orleans	WNU	WNU	448	670
12	Olinda, Pernambuco	PPO	PPO	510	590
13	San Juan	NMR	NMR	137	2,362
14	St. Petersburg	NOF	—	—	—
15	Trinidad	VPL	VPL	392 446	765 672

* Does not maintain constant watch. See the Berne List for times of watch.

TABLE 25

"BAMS" ROUTINES

Line No. (for reference only).	(Col. 1) Radio Station from which messages will be sent.	(Col. 2) Call Sign.	(Col. 3) L/F Frequency (kcs).	(Col. 3) L/F Wave-length (meters).	(Col. 4) H/F Frequency (kcs).	(Col. 4) H/F Wave-length (meters).	(Col. 5) Time (G.M.T.).
1			148	2,027	5,515	54.40	
2	Balboa	NBA			11,080	27.08	0300
3					17,690	16.96	
4			122	2,459	4,390	68.34	
5	Washington	NSS			9,425	31.83	0500
6					13,630	22.75	
7			148	2,027	5,515	54.40	
8	Balboa	NBA			11,080	27.08	0800
9					17,690	16.96	
10			122	2,459	4,390	68.34	
11	Washington	NSS			9,425	31.83	1100
12					13,630	22.75	
13			148	2,027	5,515	54.40	
14	Balboa	NBA			11,080	27.08	1400
15					17,690	16.96	
16			122	2,459	4,390	68.34	
17	Washington	NSS			9,425	31.83	1700
18					13,630	22.75	
19			148	2,027	5,515	54.40	
20	Balboa	NBA			11,080	27.08	2200
21					17,690	16.96	
22			122	2,459	4,390	68.34	
23	Washington	NSS			9,425	31.83	2300
24					13,630	22.75	

AREA 3

LIMITS OF AREA 3

(a) Area 3 is divided into Areas 3B and 3C. The following are the limits of these areas:—

Area 3B. Northern limit—the parallel of 12 degrees North.
Southern limit—the South Pole.
Eastern limit—the West and South coast of Africa, and thence down the meridian of Algoa Bay (25° 35' 30" E).
Western limit—the meridian of 15 degrees West.

Area 3C. Northern limit—the parallel of 10 degrees South from the East coast of Africa to coast of Madagascar.
Southern limit—the South Pole.
Eastern limit—the West coast of Madagascar, and thence down the meridian of 45 degrees East.
Western limit—the meridian of Algoa Bay (25° 35' 30" E).

ZONE AND AREA STATIONS IN AREA 3

(a) The following are the Zone and Area Stations in Area 3:—

Area 3B. Zone Station—Rugby.
Area Station—Simonstown.

Area 3C. Zone Station—Rugby.
Area Station—Durban.

DIRECTION FINDING ORGANIZATION

(a) *Freetown.*—D/F bearings may be obtained from Freetown Naval Radio Station, position 08° 28.5' North, 13° 15.5' West. The characteristic signal, VPU made twice followed by a 50 second dash, is transmitted on 405 kcs (740.74 metres) for 1 minute, from 0700 to 1900 G.M.T. daily, at 5, 20, 35 and 50 minutes past each hour.

Requests for the beacon outside these routine times should be made in code to Freetown Radio Station on any ship to shore frequency.

(b) *Saldanha Bay.*—Merchant ships approaching Saldanha Bay (Cape Province) in thick weather may obtain Radio transmissions from the Port War Signal Station, Saldanha Bay (Call Sign AJK) on request, to enable them to take D/F bearings.

Attention is drawn to the following characteristics:—

Title—Port War Signal Station, Saldanha Bay.
Position—33° 02' 18" South, 17° 55' 42" East.
Call Sign—AJK.
Period—Ten minutes.
Frequency—400 kcs (750 metres).

Merchant ships should call the Port War Signal Station (AJK) on 425 kcs (705 metres) using "QTG" procedure. The Port War Signal Station, on receipt of this request, will transmit on 400 kcs (750 metres) for ten minutes to enable merchant ships to take D/F bearings. Merchant ships are to use their War Radio Call Signs.

(c) (i) *Durban.*—Durban North operates throughout the 24 hours except between the hours of 1800 and 2000 local time every Monday.
Position—29° 48' 28" South, 31° 02' 42" East.
Call Sign—ZSD.
Period—Five minutes.
Frequency—300 kcs (1000 metres).
Characteristics—Transmits "CC" for 5 minutes commencing at 5, 15, 25, 35, 45 and 55 minutes past the hour.

A BAMS ORGANIZATION

(a) *In the event of a breakdown of Durban North, Durban Aeradio Station will operate as follows.*

Position:—[illegible] South, [illegible] East.

Call Sign:—[illegible].

Period:—Five minutes every half hour.

Frequency:—[illegible]

Characteristics:—Transmits three "V's" followed by a [illegible] second dash for 5 minutes every half hour.

[illegible]

TABLE 33

COASTAL STATIONS

The stations given in this table maintain constant watch on 500 kcs. and are available for the transmission of "BAMS" messages on the working waves indicated.

Line No. (for reference only).	(Col. 1) Radio Station.	(Col. 2) Call Sign.	(Col. 3) Working Wave.	
			Frequency (kcs).	Wavelength (meters).
1	Algoa Bay	ZSQ	461	650
2	Ascension Is.	ZBI	400	750
3	Freetown	VPU	143	2,098
4	Lagos*	VPY	425	706
5	Simonstown	ZSC	353	850
6	Takoradi	VPG	385	779
7	Tristan da Cunha	ZHP	379	880
8	Walvis Bay	ZSV	425	706

* Does not maintain constant watch. See the Berne List for times of watch.

TABLE 34

"BAMS" ROUTINES

Line No. (for reference only).	(Col. 1) Radio Station from which messages will be sent.	(Col. 2) Call Sign.	(Col. 3) L/F		(Col. 4) H/F		(Col. 5) Time (G.M.T.).
			Frequency (kcs).	Wavelength (meters).	Frequency (kcs).	Wavelength (meters).	
1		GBR	16	18,750			
2		GKU4			4,805	74.53	
3	Rugby	GKU1			7,355	40.79	0050
4		GAY			8,910	33.67	
5		GKU	149	2,013			
6	Simonstown	ZSC	143	2,098	6,464	46.40	0145
7					8,333	36.00	
8	Simonstown	ZSC	143	2,098	8,333	36.00	0500
9					12,845	23.72	
10	Simonstown	ZSC	143	2,098	8,333	36.00	0900
11					16,666	18.00	
12		GBR	16	18,750			
13		GAY			8,910	33.67	
14		GID			13,555	22.13	
15	Rugby	GYC7			15,960	18.80	1200
16		GYB8			19,080	15.72	
17		GKU	149	2,013			
18	Simonstown	ZSC	143	2,098	8,333	36.00	1300
19					16,666	18.00	
20	Simonstown	ZSC	143	2,098	8,333	36.00	1700
21					12,845	23.72	
22		GBR	16	18,750			
23		GKU1			7,355	40.79	
24		GAY			8,910	33.67	
25	Rugby	GIH			10,650	28.17	2000
26		GID			13,555	22.13	
27		GYC7			15,960	18.80	
28		GKU	149	2,013			
29	Simonstown	ZSC	143	2,098	6,464	46.40	2100
30					8,333	36.00	

3-C

TABLE 35

COASTAL STATIONS

[illegible]

Line No. (for reference only).	(Col. 1) Radio Station	(Col. 2) Call Sign.	(Col. 3) [illegible]	
			Frequency [illegible]	Wavelength [illegible]
[illegible]	Algoa Bay	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TABLE 36

"BAMS" ROUTINES

Line No. (for reference only).	(Col. 1) Radio Station from which messages will be sent.	(Col. 2) Call Sign.	(Col. 3) L/F		(Col. 4) H/F		(Col. 5)
			Frequency (kcs).	Wave-length (meters).	Frequency (kcs).	Wave-length (meters).	Time (G.M.T.).
1		GBR	16	18,750			
2		GKU4			4,025	74.53	
3	Rugby	GKU1			7,355	40.79	0000
4		GAY			8,910	33.67	
5		GKU	140	2,013			
6	Durban	ZSD	138.25	2,170	4,500	66.67	0130
7					8,800	34.09	
8	Durban	ZSD	138.25	2,170	4,500	66.67	0530
9					8,800	34.09	
10	Durban	ZSD	138.25	2,170	8,800	34.09	0930
11					7,110	42.19	
12		GBR	16	18,750			
13		GAY			8,910	33.67	
14	Rugby	GID			13,555	22.13	
15		GYC7			15,960	18.80	1200
16		GYB8			19,080	15.72	
17		GKU	149	2,013			
18	Durban	ZSD	138.25	2,170	8,800	34.09	1330
19					7,110	42.19	
20	Durban	ZSD	138.25	2,170	8,800	34.09	1730
21					7,110	42.19	
22		GBR	16	18,750			
23		GKU1			7,355	40.79	
24		GAY			8,910	33.67	
25	Rugby	GIH			10,650	28.17	2000
26		GID			13,555	22.13	
27		GYC7			15,960	18.80	
28		GKU	140	2,013			
29	Durban	ZSD	138.25	2,170	4,500	66.67	2130
30					8,800	34.09	

AREA 4

LIMITS OF AREA 4

(a) The following are the limits of Area 4—

Northern limit—the parallel of 15 degrees South.
Southern limit—the South Pole.
Eastern limit—the meridian of 15 degrees West.
Western limit—the East coast of the South American continent, and thence down the meridian of 74 degrees West.

ZONE AND AREA STATIONS IN AREA 4

(a) The following are the Zone and Area Stations in Area 4—

Zone Station —Washington.
Area Stations—Rio de Janeiro and the Falkland Islands.

TABLE 41

COASTAL STATIONS

The stations given in this table maintain constant watch on 500 kcs, and are available for the transmission of "BAMS" messages on the working waves indicated.

Line No. (for reference only)	(Col. 1) Radio Station	(Col. 2) Call Sign	(Col. 3) Working Wave	
			Frequency (kc/s)	Wavelength (metres)
1	Falklands	[illegible]	[illegible]	721
2	Junction, Rio Grande do Sul........	[illegible]	[illegible]	721

BAMS ORGANIZATION

AREA 4

TABLE 43

"BAMS" ROUTINES

Line No. (for reference only).	(Col. 1) Radio Station from which messages will be sent.	(Col. 2) Call Sign.	(Col. 3) L/F		(Col. 4) H/F		(Col. 5) Time (G.M.T.).
			Frequency (kcs).	Wavelength (meters).	Frequency (kcs).	Wavelength (meters).	
1	Rio de Janeiro	PPR	408	735	8,335	35.99	0130
2					16,915	17.74	
3	Falklands	VPC	125	2,400			0400
4					4,700	63.85	
5					8,555	35.06	
6	Washington	NSS	122	2,459	4,390	68.34	0500
7					9,425	31.83	
8					12,630	23.75	
9	Rio de Janeiro	PPR	408	735	8,335	35.99	0630
10					16,915	17.74	
11	Washington	NSS	122	2,459	4,390	68.34	1100
12					9,425	31.83	
13					12,630	23.75	
14	Falklands	VPC	125	2,400			1230
15					8,555	35.06	
16					17,210	17.50	
17	Rio de Janeiro	PPR	408	735	8,335	35.99	1330
18					16,915	17.74	
19	Falklands	VPC	125	2,400			1600
20					8,555	35.06	
21					17,210	17.50	
22	Washington	NSS	122	2,459	4,390	68.34	1700
23					9,425	31.83	
24					12,630	23.75	
25	Rio de Janeiro	PPR	408	735	8,335	35.99	2030
26					16,915	17.74	
27	Washington	NSS	122	2,459	4,390	68.34	2300
28					9,425	31.83	
29					12,630	23.75	

AREA 5

LIMITS OF AREA 5

(a) Area 5 is divided into Areas 5A, 5B and 5C. The following are the limits of these areas:—

Area 5A Northern limit—the Equator.
Southern limit—the South Pole.
Eastern limit—the western portion of the Australian coastline, and thence down the meridian of 130 degrees East.
Western limit—the meridian of 100 degrees East.

Area 5B Northern limit—the parallel of 23 degrees South.
Southern limit—the South Pole.
Eastern limit—the meridian of 159 degrees East.
Western limit—the south-eastern portion of the Australian coastline, and thence down the meridian of 130 degrees East.

Area 5C Northern limit—the Equator.
Southern limit—the parallel of 23 degrees South.
Eastern limit—the meridian of 159 degrees East.
Western limit—the meridian of 130 degrees East from the Equator to the north coast of Australia, and thence round the northern and eastern coast of Australia.

(b) Coastal Radio Stations or Coastal Watching Stations in danger of capture by the enemy will make the signal "ZZZZ" before abandoning the station.

These stations may use the signal "AAAA" in the same way as "ZZZZ" to denote attack by enemy aircraft.

ZONE AND AREA STATIONS IN AREA 5

(a) The following are the Zone and Area Stations in Area 5:—

Area 5A Zone Station —Manila.
Area Station —Perth.

Area 5B Zone Station —Manila.
Area Station —Sydney.

Area 5C Zone Station —Manila.
Area Station —Townsville.

AREA 5-A

TABLE 51

COASTAL STATIONS

The [illegible] given in this table maintain constant watch on 500 kc, and are available for the trans[illegible] of "BAMS" messages on the working waves indicated.

Line No. (for reference only).	(Col. 1) Radio Station.	(Col. 2) Call Sign.	(Col. 3) Working Wave.	
			Frequency (kcs).	Wavelength (meters).
1	[illegible]	[illegible]	[illegible]	[illegible]
2	[illegible]	[illegible]	[illegible]	[illegible]
3	Esperance	[illegible]	[illegible]	[illegible]
4	Geraldton	[illegible]	[illegible]	[illegible]
5	Perth	[illegible]	[illegible] [illegible]	[illegible] [illegible]
6	Wyndham*	[illegible]	[illegible]	[illegible]

*[illegible] watch only from 0001 to [illegible] and from [illegible] to [illegible].

TABLE 52

"BAMS" ROUTINES

Line No. (for reference only).	(Col. 1) Radio Station from which messages will be sent.	(Col. 2) Call Sign.	(Col. 3) L/F Frequency (kcs).	(Col. 3) L/F Wave-length (meters).	(Col. 4) H/F Frequency (kcs).	(Col. 4) H/F Wave-length (meters).	(Col. 5) Time (G.M.T.).
1			115	1,935			
2	Manila	NPO			10,745	27.92	0100
3					14,360	20.89	
4					17,000	17.65	
5			115	2,400			
6	Perth	VIP			6,340	48.08	0400
7					12,375	24.24	
8			115	1,935			
9	Manila	NPO			10,745	27.92	0700
10					14,360	20.89	
11					17,000	17.65	
12			125	2,400			
13	Perth	VIP			6,340	48.08	1000
14					12,375	24.24	
15			125	2,400			
16	Perth	VIP			6,340	48.08	1300
17					12,375	24.24	
18			115	1,935			
19	Manila	NPO			5,185	57.86	1600
20					10,745	27.92	
21					14,360	20.89	
22			115	1,935			
23	Manila	NPO			5,185	57.86	1800
24					10,745	27.92	
25					14,360	20.89	
26			125	2,400			
27	Perth	VIP			6,240	48.08	2200
28					12,375	24.24	

TABLE II

COASTAL STATIONS

The stations given in this table maintain constant watch on 500 kcs. and are available for the transmission of "BAMS" messages on the working waves indicated.

Line No. (for reference only).	(Col. 1) Radio Station.	(Col. 2) Call Sign.	(Col. 3) Working Wave. Frequency (kcs).	(Col. 3) Working Wave. Wavelength (meters).
1	Adelaide	VIA	[illegible]	[illegible]
2	Brisbane	VIB	[illegible]	[illegible]
3	Flinders Island*	VIL	[illegible]	[illegible]
4	Hobart	VIH	[illegible]	[illegible]
5	King Island*	VIK	[illegible]	[illegible]
6	Melbourne	VIM	[illegible]	[illegible]
7	Sydney	VIS	[illegible]	[illegible]

*Maintains watch only during daylight hours.

TABLE III

"BAMS" ROUTINES

Line No. (for reference only).	(Col. 1) Radio Station from which messages will be sent.	(Col. 2) Call Sign.	(Col. 3) L/F Frequency (kcs).	(Col. 3) L/F Wavelength (meters).	(Col. 4) H/F Frequency (kcs).	(Col. 4) H/F Wavelength (meters).	(Col. 5) Time (G.M.T.).
1	Manila	NPO	155	1,935			
2					10,745	27.92	0100
3					14,360	20.89	
4					17,000	17.65	
5			125	2,400			
6	Sydney	VIS			6,245	48.04	0400
7					12,385	24.24	
8			155	1,935			
9	Manila	NPO			10,745	27.92	0700
10					14,360	20.89	
11					17,000	17.65	
12			125	2,400			
13	Sydney	VIS			6,245	48.04	1000
14					12,385	24.24	
15			125	2,400			
16	Sydney	VIS			6,245	48.04	1300
17					12,385	24.24	
18			155	1,935			
19	Manila	NPO			5,185	57.86	1600
20					10,745	27.92	
21					14,360	20.89	
22			155	1,935			
23	Manila	NPO			5,185	57.86	1900
24					10,745	27.92	
25					14,360	20.89	
26			125	2,400			
27	Sydney	VIS			6,245	48.04	2200
28					12,385	24.24	

AREA
5-B

TABLE [illegible]

R/T BROADCAST ROUTINES

Line No. (for reference only).	(Col. 1) R/T Station.	(Col. 2) Frequency (kcs).	Wavelength (meters).	(Col. 3) Time (G.M.T.).
1	Adelaide	[illegible]	[illegible]	[illegible]
2	Sydney			[illegible]
3	Adelaide			[illegible]
4	Sydney			[illegible]

TABLE 34

AREA
5-C

COASTAL STATIONS

The stations given in this table maintain constant watch on 500 kcs, and are available for the transmission of "BAMS" messages on the working waves indicated.

Line No. (for reference only).	(Col. 1) Radio Station.	(Col. 2) Call Sign.	(Col. 3) Working Wave. Frequency (kcs).	Wavelength (meters).
1	Bisk	NCE	468	641
2	Cooktown	VIC	405	741
3	Darwin	VID	417	719
4	Manus	NTF	468	641
5	Port Moresby	VIG	415	723
6	Thursday Island	VII	425 6,230	700 48
7	Townsville	VIT	430 6,225	698 48.19
8	Willis Island	VIQ	410	732

AREA 5-C

"BAMS" ROUTINES

Line No. (for reference only).	(Col. 1) Radio Station from which messages will be sent.	(Col. 2) Call Sign.	(Col. 3) L/F		(Col. 4) H/F		(Col. 5) Time (G.M.T.)
			Frequency (kcs).	Wavelength (meters).	Frequency (kcs).	Wavelength (meters).	
1			155	1,935			
2	Manila	NPO			10,745	27.92	
3					14,360	20.89	
4					17,000	17.65	
5			125	2,400			
6	Townsville	VIT			6,225	48.19	
7					12,355	24.24	
8			155	1,935			
9	Manila	NPO			10,745	27.92	
10					14,360	20.89	
11					17,000	17.65	
12			125	2,400			
13	Townsville	VIT			6,225	48.19	
14					12,355	24.24	
15			125	2,401			
16	Townsville	VIT			6,225	48.19	
17					12,355	24.24	
18			155	1,935			
19	Manila	NPO			5,185	57.86	
20					10,745	27.92	
21					14,360	20.89	
22			155	1,935			
23	Manila	NPO			5,185	57.86	
24					10,745	27.92	
25					14,360	20.89	
26			125	2,400			
27	Townsville	VIT			6,225	48.19	
28					12,355	24.24	

AREA 6

LIMITS OF AREA 6

(a) Area 6 is divided into Areas 6A, 6B, 6C and 6D. The following are the limits of these areas:—

Area 6A Northern limit—the North Pole.
Southern limit—the parallel of 42 degrees North.
Eastern limit—the North and West coast of the North American continent.
Western limit—the North and East coast of the continent of Asia.

Area 6B Northern limit—the parallel of 42 degrees North.
Southern limit—the Equator to 110 degrees West, thence from position 11 degrees North and 110 degrees West to the coast of the American continent at the border of Mexico and Guatemala.
Eastern limit—the West coast of the North American continent from 42 degrees North to the border of Mexico and Guatemala, and thence down the meridian of 110 degrees West.
Western limit—the meridian of 155 degrees East.

Area 6C Northern limit—the Equator.
Southern limit—the South Pole.
Eastern limit—the meridian of 110 degrees West.
Western limit—the meridian of 159 degrees East.

Area 6D Northern limit—the parallel of 42 degrees North.
Southern limit—the Equator.
Eastern limit—the meridian of 155 degrees East.
Western limit—the East coast of the continent of Asia to 15 degrees North; thence to a position latitude 5 degrees North and longitude 120 degrees East; and thence down the meridian of 120 degrees East.

ZONE AND AREA STATIONS IN AREA 6

(a) The following are the Zone and Area Stations in Area 6:—

Area 6A Zone Station—Oahu.
Area Stations—Oahu and San Francisco.

Area 6B Zone Station—Oahu.
Area Stations—Oahu and San Francisco.

Area 6C Zone Station—Oahu.
Area Station—Auckland.

Area 6D Zone Station—Manila.
Area Station—Manila.

(b) The organization in Area 6 varies slightly from the standard organization in that Oahu acts as an Area Station to both Areas 6A and 6B as well as being the Zone Station. In consequence, messages for ships in the area will not necessarily be broadcast at two consecutive routine periods from both Oahu and the other Area Station but may only be broadcast at two [illegible] in Tables 63 and 45.

AREA 6-A

DIRECTION FINDING ORGANIZATION

Areas 6A and 6B (U.S. D/F Stations only).

(a) Service is obtained by calling on 375 kcs (800 meters); stations will answer on the same frequency. All U. S. D/F stations are grouped with each group controlled by a Group Control Radio Station. Ships desiring service should ordinarily call the Group Control Station who will answer for any or all stations comprising the group. Requests may be directed to individual stations on occasions when service from those stations only is desired. The call is to be made in the usual manner followed by the abbreviation "QTE."

(b) Ships are to use their War Radio Call Signs.

(c) When instructed to transmit, the calling ship should transmit a 30-second dash followed by the ship's War Radio Call Sign. This may be repeated as necessary upon direction of the D/F station. Sharp transmitter tuning on 375 kcs is important. Signal should be of medium strength; if necessary, the station will direct the ship to increase or decrease the power used.

(d) Bearing information will be furnished in the following order:

1. Abbreviation "QTE" followed by:
2. True bearing in degrees from the D/F station. (Poor bearings will be reported as "doubtful".)
3. Time of observation (GCT).

(e) As soon as the ship has received the result of the observation, it shall repeat the message to the Group Control Station, or in the case of requests made to individual stations, the D/F station. The latter shall then confirm the accuracy of the repetition or, when necessary, shall correct it by again repeating the message.

(f) Sector of Calibration: The sector of calibration of a D/F station is the sector about the receiving coil of the station in which the deviation of radio bearings is known. Sectors are measured clockwise from 0° (true north) to 360° and are given looking from the station seaward. Bearings which do not fall within the sector of calibration of a station should be considered unreliable.

(g) U. S. D/F stations and their Group Control Stations guard the distress frequency (500 kcs/600 m) continuously.

TABLE 61

COASTAL STATIONS

The stations given in this table maintain constant watch where indicated in Col. 2, and/or are available for the transmission of "BAMS" messages using working waves and call signs shown in Col. 3.

Line No. (for reference only).	(Col. 1) Radio Station.	(Col. 2) Stations keeping constant watch on 500 kc/s. Call Sign.	(Col. 3) Stations transmitting "BAMS" messages. Call Sign.	Working Wave. Frequency (kcs).	Working Wave. Wavelength (meters).
1	Adak	NUD	NUD	468	641
2	Attu	NZL	NZL	468	641
3	Bull Harbour	VAG	VAG	470	638
4	Dutch Harbor	NPE	NPR	138	2,341
5	Estevan	VAX	VAE	474	633
6	Hillsboro, Oregon	KEK	—	—	—
7	Ketchikan, Alaska	NMJ	NMJ	425	706
8	Kodiak, Alaska	NHB	NHB	106	2,830
9	Prince Rupert	VAJ	VAJ	436	688
10	Seattle, Wash.	NMW	—	—	—
11	Victoria	VAK	VAK	441	680
12	Westport	NOV	NOV	480	625

TABLE 49

"BAMS" ROUTINES

Line No. (for reference only).	(Col. 1) Radio Station from which messages will be sent.	(Col. 2) Call Sign.	(Col. 3) L/F		(Col. 4) H/F		(Col. 5) Time (G.M.T.).
			Frequency (kcs).	Wavelength (meters).	Frequency (kcs).	Wavelength (meters).	
1	Oahu	NPM	16.68*	17,986	9,905	30.29	0100
2					14,390	20.85	
3					17,370	17.27	
4	San Francisco	NPG	115	2,609	9,255	32.41	0400
5					12,540	23.92	
6	Oahu	NPM	16.68	17,986	6,380	47.02	0700
7					9,905	30.29	
8					14,390	20.85	
9	San Francisco	NPG	115	2,609	9,255	32.41	1000
10					12,540	23.92	
11	San Francisco	NPG	115	2,609	9,255	32.41	1400
12					12,540	23.92	
13	Oahu	NPM	16.68	17,986	4,525	66.30	1600
14					6,380	47.02	
15					9,905	30.29	
16	Oahu	NPM	16.68	17,986	4,525	66.30	1800
17					6,380	47.02	
18					9,905	30.29	
19	San Francisco	NPG	115	2,609	9,255	32.41	2200
20					12,540	23.92	

* 56 kcs (5,360 meters) will replace 16.68 kcs on this schedule Thursdays only.

Note: In the event of failure on 16.68 kcs at any time, BAMS routines from Oahu (NPM) will automatically be transmitted on 56 kcs (5,360 meters).

TABLE 63

RIT BROADCAST ROUTINES

Line No. (for reference only).	(Col. 1) R/T Station.	(Col. 2)		(Col. 3) Time (G.M.T.).
		Frequency (kcs).	Wavelength (meters).	
1	Cape Lazo	1,826	164	0410
2	Alert Bay			[illegible]
3	Prince Rupert			0550
4	Vancouver			0710
5	Prince Rupert			1550
6	[illegible]			[illegible]
7	Cape Lazo			1650
8	Alert Bay			1700

APPENDIX

A

RAMS ORGANIZATION

AREA

6-A

TABLE 6A1

U. S. DIF STATIONS FROM WHICH BEARINGS MAY BE OBTAINED

Note: Bearings are obtained by calling on 315 kcs (960 meters).

Line No. (for reference only).	(Col. 1) D/F Station.	(Col. 2) Position of Receiving Loop.	(Col. 3) Call Sign.	(Col. 4) Sector of Calibration.
1	Westport, Wash. Group Control For:		NOV*	
2	Point St. George, Calif.	41° 47' 00" N. 124° 13' 06" W.	NYW	176° to 010°
3	Empire, Oregon	43° 22' 57" N. 124° 18' 31" W.	NPF	208° to 357°
4	Fort Stevens, Oregon	46° 11' 48" N. 123° 58' 29" W.	NZR	184° to 331°
5	Elpun Beach, Wash.	46° 27' 55" N. 124° 03' 14" W.	NZS	154° to 333°
6	Tatoosh Island, Wash.	48° 23' 18" N. 124° 44' 03" W.	NPD	178° to 086°

* *Note:* Group control stations answer for any or all stations of the group but are not themselves radio direction finder stations.

TABLE 6A2

CANADIAN DIF STATIONS FROM WHICH BEARINGS MAY BE OBTAINED

Note: The station keeps continuous watch on 500 kcs and will change to 375 kcs to give bearings after communication has been established on the former.

Line No. (for reference only).	(Col. 1) D/F Station.	(Col. 2) Position of Transmitting Aerial.	(Col. 3) Call Sign.	(Col. 4) Remarks.
1	Pachena, B. C.	48° 43' 21" N. 125° 05' 44" W.	VAD	Position of Transmitting and Receiving Aerial are so close together as to be considered identical.

TABLE 4a

COASTAL STATIONS

The Stations given in this table maintain constant watch where indicated in Col. 2, and/or are available for the transmission of "BAMS" messages using call signs and working waves shown in Col. 3.

Line No. (for reference only).	(Col. 1) Radio Station.	(Col. 2) Stations keeping constant watch on 500 kcs. Call sign.	(Col. 3) Stations transmitting "BAMS" messages. Call sign.	Working Wave. Frequency (kcs).	Working Wave. Wavelength (meters).
1	Eniwetok	WVNG	WVNG	468	641
2	Honolulu, T. H.	NMO	NMO	425	706
3	Johnston Island	NIQ	NIQ	468	641
4	Kwajalein	NDJ	NDJ	468	641
5	Long Beach	NMQ	NMQ	425 468	706 641
6	Majuro	WVNB	WVNB	468	641
7	Midway	NQM	NQM	468	641
8	Palmyra Island	NIX	NIX	468	641
9	Palo Alto	KFS	KFS	418	718
10	San Diego	NPL	—	—	—

TABLE 5a

"BAMS" ROUTINES

Line No. (for reference only).	(Col. 1) Radio Station from which messages will be sent.	(Col. 2) Call Sign.	(Col. 3) L/F Frequency (kcs).	(Col. 3) L/F Wavelength (meters).	(Col. 4) H/F Frequency (kcs).	(Col. 4) H/F Wavelength (meters).	(Col. 5) Time (G.M.T.).
1			16.68*	17,986	9,905	30.29	
2	Oahu	NPM			14,390	20.85	0100
3					17,370	17.27	
4	San Francisco	NPG	115	2,609	9,255	32.41	0400
5					12,540	23.92	
6			16.68	17,986	6,380	47.02	
7	Oahu	NPM			9,905	30.29	0700
8					14,390	20.85	
9	San Francisco	NPG	115	2,609	9,255	32.41	1000
10					12,540	23.92	
11	San Francisco	NPG	115	2,609	9,255	32.41	1400
12					12,540	23.92	
13			16.68	17,986	4,525	66.30	
14	Oahu	NPM			6,380	47.02	1600
15					9,905	30.29	
16			16.68	17,986	4,525	66.30	
17	Oahu	NPM			6,380	47.02	1800
18					9,905	30.29	
19	San Francisco	NPG	115	2,609	9,255	32.41	2200
20					12,540	23.92	

*56 kcs (5,360 meters) will replace 16.68 kcs on this schedule Thursdays only.

Note: In the event of failure on 16.68 kcs at any time, BAMS routines from Oahu (NPM) will automatically be transmitted on 56 kcs (5,360 meters).

APPENDIX

A

SAMS ORGANIZATION

AREA

6-B

TABLE 66

D/F STATIONS FROM WHICH BEARINGS MAY BE OBTAINED

Note: Bearings are obtained by calling on 375 kcs (800 meters)

Line No. (for reference only).	D/F Station.	Position of Receiving Loop	Call Sign.	Sector of Calibration.
1	Long Beach (Point Vicente), Calif.		NMQ*	
	Group Control For:			
2	Imperial Beach, Calif.	32° 35' 14" N. 117° 07' 54" W.	NPZ**	170° to 320°
3	Point Fermin, Calif.	33° 42' 18" N. 118° 17' 36" W.	NPX	110° to 290°
4	Point Hueneme, Calif.	34° 08' 42" N. 119° 12' 34" W.	NCA	128° to 318°
5	Point Arguello, Calif.	34° 34' 38" N. 120° 38' 31" W.	NPK	157° to 332°
6	San Francisco (Sweeny Ridge), Calif.		NMC*	
	Group Control For:			
7	Point Montara, Calif.	37° 32' 04" N. 122° 31' 03" W.	NLH**	Cannot be calibrated—all sectors doubtful.
8	Farallon Islands, Calif.	37° 41' 49" N. 123° 00' 02" W.	NPI**	000° to 360°
9	Point Reyes, Calif.	38° 03' 10" N. 122° 59' 33" W.	NLG**	212° to 359°

* Note: Group control stations answer for any or all stations of the group but are not themselves radio direction finder stations.

** Note: Calls to these stations will be answered by Group Control.

AREA

6-C

TABLE 67

COASTAL STATIONS

The Stations given in this table maintain constant watch on 500 kcs, and are available for the transmission of "SAMS" messages on the working waves indicated.

Line No. (for reference only).	(Col. 1) Radio Station.	(Col. 2) Call Sign.	(Col. 3) Working Wave.	
			Frequency (kcs).	Wavelength (meters).
1	Apia	ZMA	375	800
2	Auckland	ZLD	445	674
3	Awarua	ZLB	405	741
4	Rarotonga	ZKR	375	800
5	Suva	VRP2	441	680
6	Tutuila, Samoa	NPU	104	2,885
7	Wellington	ZLW	385	779
8	Noumea	NXZ	468	641
9	Espiritu Santo	NUB	468	641
10	Bora Bora	NXO	468	641
11	Pitcairn Island	ZKG	395	759
12	Funafuti	NJF	468	641
13	Guadalcanal	NGK	468	641

TABLE 6A

"BAMS" ROUTINES

Line No. (for reference only).	(Col. 1) Radio Station from which messages will be sent.	(Col. 2) Call Sign.	(Col. 3) L/F		(Col. 4) H/F		(Col. 5)
			Frequency (kcs).	Wavelength (meters).	Frequency (kcs).	Wavelength (meters).	Time (G.M.T.).
1	Oahu	NPM	16.68*	17,980	9,905	30.29	0130
2					14,390	20.85	
3					17,370	17.27	
4	Auckland	ZLD	445	674	7,850	38.22	0400
5					14,730	20.37	
6	Oahu	NPM	16.68	17,980	6,380	47.02	0730
7					9,905	30.29	
8					14,390	20.85	
9	Auckland	ZLD	445	674	7,850	38.22	1000
10					14,730	20.37	
11	Auckland	ZLD	445	674	7,850	38.22	1300
12					14,730	20.37	
13	Oahu	NPM	16.68	17,980	4,525	66.30	1600
14					6,380	47.02	
15					9,905	30.29	
16	Oahu	NPM	16.68	17,980	4,525	66.30	1830
17					6,380	47.02	
18					9,905	30.29	
19	Auckland	ZLD	445	674	7,850	38.22	2200
20					14,730	20.37	

*56 kcs (5,360 meters) will replace 16.68 kcs on this schedule Thursdays only.

Note: In the event of failure on 16.68 kcs on any time, BAMS routines from Oahu (NPM) will automatically be transmitted on 56 kcs (5,360 meters).

TABLE 6BA

R/T BROADCAST ROUTINES

Line No. (for reference only).	(Col. 1) R/T Station.	(Col. 2)		(Col. 3)
		Frequency (kcs).	Wavelength (meters).	Time (G.M.T.).
1	Wellington	5,130	58.50	In summer months: 0030, 0330, 2100 In winter months: 0100, 0400, 2130

APPENDIX

A

BAMS ORGANIZATION

AREA

6-D

TABLE 68

COASTAL STATIONS

The stations given in the table are to maintain constant watch where indicated in Col. 2, and/or are available for the transmission of "BAMS" messages using call signs and working waves shown in Col. 3.

Line No. (for reference only).	(Col. 1) Radio Station.	(Col. 2) Stations keeping constant watch on 500 kcs. Call Sign.	(Col. 3) Stations transmitting "BAMS" messages. Call Sign.	Working Wave. Frequency (kcs).	Working Wave. Wavelength (meters).
1	Guam	NPN	NPN	462	622
2	Leyte	NIEN	NIEN	468	641
3	Manila	NPO	NPO	468	641
4	Montai	NFA	NFA	468	641
5	Palawan	NHU	NHU	468	641
6	Pulilu	WVNC	WVNC	468	641
7	Zamboanga	NWO	NWO	468	641

TABLE 69A

"BAMS" ROUTINES

Line No. (for reference only).	(Col. 1) Radio Station from which messages will be sent.	(Col. 2) Call Sign.	(Col. 3) L/F Frequency (kcs).	(Col. 3) L/F Wavelength (meters).	(Col. 4) H/F Frequency (kcs).	(Col. 4) H/F Wavelength (meters).	(Col. 5) Time (G.M.T.).
1							
2	Manila	NPO	155	1,935			
3					10,745	27.92	0100
4					14,360	20.89	
5					17,000	17.65	
6	Manila	NPO	155	1,935			
7					10,745	27.92	0400
8					14,360	20.89	
9					17,000	17.65	
10	Manila	NPO	155	1,935			
11					10,745	27.92	0700
12					14,360	20.89	
13					17,000	17.65	
14	Manila	NPO	155	1,935			
15					5,185	57.86	1000
16					10,745	27.92	
17					14,360	20.89	
18	Manila	NPO	155	1,935			
19					5,185	57.86	1300
20					10,745	27.92	
21					14,360	20.89	
22	Manila	NPO	155	1,935			
23					5,185	57.86	1600
24					10,745	27.92	
25					14,360	20.89	
26	Manila	NPO	155	1,935			
27					5,185	57.86	1900
28					10,745	27.92	
29					14,360	20.89	
30	Manila	NPO	155	1,935			
31					10,745	27.92	2200
32					14,360	20.89	
33					17,000	17.65	

AREA 7

AREA 7

LIMITS OF AREA 7

(a) Area 7 is divided into Areas 7A, 7B, 7C, and 7D. The following are the limits of these areas:—

AREA 7A Northern limit—the South coast of the continent of Asia.
Southern limit—the parallel of 18 degrees South from the East coast of Africa to Madagascar; thence along the North coast of Madagascar to 12 degrees South; thence to 90 degrees East.
Eastern limit—the meridian of 90 degrees East.
Western limit—the East coast of Africa, as far West as the meridian of Aden.

AREA 7B Northern limit—the parallel of 12 degrees South.
Southern limit—the South Pole.
Eastern limit—the meridian of 80 degrees East.
Western limit—the East coast of Madagascar, and thence down the meridian of 45 degrees East.

AREA 7C Northern limit—the parallel of 12 degrees South to 90 degrees East; thence to the Equator at 90 degrees East; and thence along the Equator to 100 degrees East.
Southern limit—the South Pole.
Eastern limit—the meridian of 100 degrees East.
Western limit—the meridian of 80 degrees East.

AREA 7D Northern limit—the coast of India, Burma, Malaya, Siam, and French Indo China to 15 degrees North, and thence to a position latitude 5 degrees North and longitude 120 degrees East.
Southern limit—the Equator.
Eastern limit—the meridian of 120 degrees East.
Western limit—the meridian of 90 degrees East.

ZONE AND AREA STATIONS IN AREA 7

(a) The following are the Zone and Area Stations in Area 7:—

AREA 7A Zone Station—Rugby.
Area Station—Colombo (Bombay).

AREA 7B Zone Station—Rugby.
Area Station—Colombo (Mauritius).

AREA 7C Zone Station—Rugby.
Area Station—Colombo.

AREA 7D Zone Station—Rugby.
Area Station—Colombo.

APPENDIX A

BAMS ORGANIZATION

AREA 7

DIRECTION FINDING ORGANISATION

The following D/F facilities are available to merchant ships in Area 7:—

(a) *Bombay Radio Station (VWB).*—This station will take D/F bearings of ships upon request. The "QTE" procedure should be used, and the bearings will be passed to the ship in plain language or, if considered necessary, will be coded in "*WIMS, Vol. 2,*" recoded by the *General Recoding Table* (S.P. 02272 series). The "QTG" procedure may also be used, and Bombay Radio (VWB) will comply immediately upon receipt of the signal "QTG."

(b) *Khanderi Lighthouse Radio Beacon (VUK), Bombay Port.*—This radio beacon operates daily between 2130 and 1100 G.M.T., and will be operated on request outside these hours. Merchant vessels requiring the beacon should make a coded message to Bombay Radio Station (VWB), using "*WIMS, Vol. 2,*" recoded by the *General Recoding Table* (S.P. 02272 series), stating the times between which the Khanderi Radio Beacon is required. The details of the Radio Beacon are as follows:—

Position:—18° 42' 11" North, 72° 48' 51" East.
Frequency:—285.7 kcs (1,050 metres).
Period:—Four minutes.
Characteristics:—VUK operated 16 times = 48 seconds.
LONG DASH..... = 10 seconds.
VUK once..... = 2 seconds.
SILENT ..... = 180 seconds.
Total period (4 minutes) ... = 240 seconds.

(c) *Kilindini Beacon.*—This beacon will be operated on request to Mombasa Radio Station (VPQ). Particulars are as follows:—

Position:—04° 03' 09" South, 39° 37' 00" East.
Frequency:—310 kcs (968 metres).
Period:—Continuously or for first 10 minutes in each half hour.
Call sign:—MB.

(d) *Colombo.*—This beacon operates at routine periods, transmitting at each hour and at 30 minutes past each hour G.M.T. Particulars are as follows:—

Position:—06° 54' 14" North, 79° 52' 48" East.
Frequency:—410 kcs (667 metres).
Characteristics:—OZH repeated 3 times; followed by 15 seconds dash. The whole repeated 3 times.

(e) *Aden.*—This beacon operates continuously. Particulars are as follows:—

Position:—12° 52' 00" North, 45° 00' 00" East.
Frequency:—365 kcs (822 metres).
Call sign:—ADN

(f) *Perim.*—This beacon operates continuously. Particulars are as follows:—

Position:—12° 40' 00" North, 43° 24' 30" East.
Frequency:—270 kcs (1,111 metres).
Call sign:—PM

Note.—When making "QTE" or "QTG" signals, ships should use their War Radio Call Signs. When making a request to code for a radio beacon, the General Radio Call Sign procedure is to be used.

AIR RAID WARNING

(a) To indicate to merchant shipping in Area 7 that an attack by aircraft is imminent, a "RED" warning will be issued signifying that one or more hostile aircraft are approaching or are in the area mentioned, or that two or more unidentified aircraft are approaching the area simultaneously.

(b) WHITE messages will be issued to cancel a "RED" warning when the danger of attack appears to have passed.

(c) Both "RED" and "WHITE" messages will be broadcast in plain language and transmitted by coastal stations on 500 kcs radio telegraphy. They will also be transmitted by Naval radio stations on appropriate waves for H.M. ships.

(d) The wording will take the form "RED MADRAS" when the message originates as a warning to the port itself, or "RED APPROACHES MADRAS" when hostile or unidentified aircraft are known to be approaching.

(e) The approach areas are defined as follows—

(i) Approaches Calcutta ..... Between the coast of India and Burma and 18° North.

(ii) Approaches Visagapatam ..... Between 15° North and 18° North and the East coast of India to 85° East.

(iii) Approaches Madras ..... Between 10° North and 15° North and the East coast of India to 85° East.

(iv) Approaches Trincomalee ..... Between 5° North and 10° North to the Eastward of 81° to 85° East.

(v) Approaches Colombo ..... Between 5° North and 10° North and 70° East to 81° East.

(f) Other areas are not specifically defined but the place named in the warning, e.g., "RED APPROACHES KILINDINI" or "RED APPROACHES SEYCHELLES", will serve to indicate that hostile aircraft are in the sea area adjacent to the place mentioned.

TABLE (1)

COASTAL STATIONS

7-A

The stations given in this table undertake merchant watch on 500 kcs, and are available for the transmission of "BAMS" messages on the working waves indicated.

Line No. (for reference only).	(Col. 1) Radio Station.	(Col. 2) Call Sign.	(Col. 3) Working Wave.	
			Frequency (kcs).	Wavelength (metres).
1	Aden	EQX	500	600
2	Addu Atoll	MQJ	400	750
3	Aden	GZQ	465	645
4	Bahrein	VTE	460	652
5	Bombay	VWB	420	714
6	Calcutta	VWC	420	714
7	Colombo	GZH	445	674
8	Diego Suarez	MHP	450	667
9	Karachi	VWK	410	732
10	Khor Kuwai	MXZ3	445	674
11	Madras	VWM	475	632
12	Mombasa	VPQ	460	652
13	Seychelles	ZCQ	440	681

APPENDIX

A

BAMS ORGANIZATION

AREA

7-A

TABLE 71

"BAMS" ROUTINE

Line No. (for reference only).	(Col. 1) Radio Station from which messages will be sent.	(Col. 2) Call Sign.	(Col. 3) I./F		(Col. 4) H/F		(Col. 5) Time (G.M.T.).
			Frequency (kcs).	Wavelength (meters).	Frequency (kcs).	Wavelength (meters).	
1	Rugby	GBR	16	18,750			0000
2		GKU4			4,025	74.53	
3		GKU1			7,355	40.79	
4		GAY			8,910	33.67	
5		GKU	149	2,013			
6	Colombo	GZH2	123	2,439			0130
7		GZH822			8,220	36.50	
8		GZH133			12,330	24.33	
9		GZH164			16,440	18.25	
10	Colombo	GZH2	123	2,439			0500
11		GZH822			8,220	36.50	
12		GZH133			12,330	24.33	
13		GZH164			16,440	18.25	
14	Colombo	GZH2	123	2,439			0800
15		GZH822			8,220	36.50	
16		GZH133			12,330	24.33	
17		GZH164			16,440	18.25	
18	Rugby	GBR	16	18,750			1200
19		GAY			8,910	33.67	
20		GID			13,555	22.13	
21		GYC7			15,960	18.80	
22		GYB8			19,080	15.72	
23		GKU	149	2,013			
24	Colombo	GZH2	123	2,439			1300
25		GZH822			8,220	36.50	
26		GZH133			12,330	24.33	
27		GZH164			16,440	18.25	
28	Colombo	GZH2	123	2,439			1700
29		GZH822			8,220	36.50	
30		GZH133			12,330	24.33	
31		GZH164			16,440	18.25	
32	Rugby	GBR	16	18,750			2000
33		GKU1			7,355	40.79	
34		GAY			8,910	33.67	
35		GIH			10,650	28.17	
36		GID			13,555	22.13	
37		GYC7			15,960	18.80	
38		GKU	149	2,013			
39	Colombo	GZH2	123	2,439			2100
40		GZH41			4,110	72.99	
41		GZH822			8,220	36.50	
42		GZH133			12,330	24.33	

Note: BOMBAY (VWF) will repeat Colombo traffic for Area 7A on 135 kcs (2,222 meters) at 0030, 1400 and 2200 G.M.T. Ships in Area 7A are to read Bombay routines if reception of Colombo is unsatisfactory.

TABLE 7J

COASTAL STATIONS

The stations given in this table maintain constant watch on 500 kcs, and are available for the transmission of "BAMS" messages on the working waves indicated.

Line No. (for reference only).	(Col. 1) Radio Station.	(Col. 2) Call Sign.	(Col. 3) Working Wave.	
			Frequency (kcs).	Wavelength (meters).
1	Mauritius	VRS	468	641
2	Diego Suarez	[illegible]	450	667

TABLE 7K

"BAMS" ROUTINES

Line No. (for reference only).	(Col. 1) Radio Station from which messages will be sent.	(Col. 2) Call Sign.	(Col. 3) L/F Frequency (kcs).	(Col. 3) L/F Wave-length (meters).	(Col. 4) H/F Frequency (kcs).	(Col. 4) H/F Wave-length (meters).	(Col. 5) Time (G.M.T.).
1		GBR	16	18,750			
2		GKU4			4,095	74.53	
3	Rugby	GKU3			7,355	40.79	0000
4		GAY			8,910	33.67	
5		GKU	149	2,013			
6		GZH2	123	2,439			
7	Colombo	GZH822			8,220	36.50	0330
8		GZH123			12,330	24.33	
9		GZH164			16,440	18.25	
10		GZH2	123	2,439			
11	Colombo	GZH822			8,220	36.50	0500
12		GZH123			12,330	24.33	
13		GZH164			16,440	18.25	
14		GZH2	123	2,439			
15		GZH822			8,220	36.50	
16	Colombo	GZH123			12,330	24.33	0800
17		GZH164			16,440	18.25	
18		GBR	16	18,750			
19		GAY			8,910	33.67	
20	Rugby	GID			13,555	22.13	
21		GYC7			15,960	18.80	1200
22		GYB8			19,080	15.73	
23		GKU	149	2,013			
24		GZH2	123	2,439			
25		GZH822			8,220	36.50	
26	Colombo	GZH123			12,330	24.33	1300
27		GZH164			16,440	18.25	
28		GZH2	123	2,439			
29		GZH822			8,220	36.50	
30	Colombo	GZH123			12,330	24.33	1700
31		GZH164			16,440	18.25	
32		GBR	16	18,750			
33		GKU3			7,355	40.79	
34		GAY			8,910	33.67	
35	Rugby	GIH			10,650	28.17	2000
36		GID			13,555	22.13	
37		GYC7			15,960	18.80	
38		GKU	149	2,013			
39		GZH2	123	2,439			
40		GZH41			4,110	72.99	
41	Colombo	GZH822			8,220	36.50	2100
42		GZH123			12,330	24.33	

Note. MAURITIUS (VRS) will repeat Colombo traffic for Area 7B on [illegible] kcs ([illegible]) [illegible] at 0800, 1400 and 2300 G.M.T. Ships in Area 7B are to read Mauritius routines if reception of Colombo is unsatisfactory.

APPENDIX A

BAMS ORGANIZATION

AREA 7-C

TABLE VI

"BAMS" ROUTINES

Line No. (for reference only).	(Col. 1) Radio Station from which messages will be sent.	(Col. 2) Call Sign.	(Col. 3) I./F. Frequency (kcs).	(Col. 3) I./F. Wavelength (meters).	(Col. 4) H./F. Frequency (kcs).	(Col. 4) H./F. Wavelength (meters).	(Col. 5) Time (G.M.T.).
1		GBR	16	18,750			
2		GKU4			4,025	74.53	
3	Rugby	GKU1			7,355	40.79	0000
4		GAY			8,910	33.67	
5		GKU	149	2,013			
6		GZH2	123	2,439			
7		GZH822			8,230	36.50	
8	Colombo	GZH123			12,330	24.33	0130
9		GZH164			16,440	18.25	
10		GZH2	123	2,439			
11		GZH822			8,230	36.50	
12	Colombo	GZH123			12,330	24.33	0230
13		GZH164			16,440	18.25	
14		GZH2	123	2,439			
15		GZH822			8,220	36.50	
16	Colombo	GZH123			12,330	24.33	0800
17		GZH164			16,440	18.25	
18		GBR	16	18,750			
19		GAY			8,910	33.67	
20		GID			13,555	22.13	
21	Rugby	GYC7			15,060	19.89	1200
22		GVB8			15,600	19.22	
23		GKU	149	2,013			
24		GZH2	123	2,439			
25		GZH822			8,220	36.50	
26	Colombo	GZH123			12,330	24.33	1300
27		GZH164			16,440	18.25	
28		GZH2	123	2,439			
29		GZH822			8,220	36.50	
30	Colombo	GZH123			12,330	24.33	1700
31		GZH164			16,440	18.25	
32		GBR	16	18,750			
33		GKU1			7,355	40.79	
34		GAY			8,910	33.67	
35	Rugby	GID			10,630	28.17	2000
36		GID			13,555	22.13	
37		GYC7			15,960	18.80	
38		GKU	149	2,013			
39		GZH2	123	2,439			
40		GZH41			4,110	72.99	
41	Colombo	GZH822			8,220	36.50	2100
42		GZH123			12,330	24.33	

TABLE 76

COASTAL STATIONS

The stations given in this table maintain constant watch on 500 kcs. and are available for the transmission of "BAMS" messages on the working waves indicated.

Line No. (for reference only).	(Col. 1) Radio Station.	(Col. 2) Call Sign.	(Col. 3) Working Wave.	
			Frequency (kcs).	Wavelength (meters).
1	Akyab	VTO	[illegible]	[illegible]
2	Calcutta	VWC	420	[illegible]

TABLE 77

"BAMS" ROUTINES

Line No. (for reference only).	(Col. 1) Radio Station from which messages will be sent.	(Col. 2) Call Sign.	(Col. 3) L/F		(Col. 4) H/F		(Col. 5) Time (G.M.T.).
			Frequency (kcs).	Wavelength (meters).	Frequency (kcs).	Wavelength (meters).	
1		GBR	16	18,750			
2		GKU4			4,025	74.53	
3	Rugby	GKU3			7,355	40.79	0005
4		GAY			8,910	33.67	
5		GKU	149	2,013			
6		GZH2	123	2,439			
7	Colombo	GZH822			8,220	36.50	0135
8		GZH123			12,330	24.33	
9		GZH164			16,440	18.25	
10		GZH2	123	2,439			
11	Colombo	GZH822			8,220	36.50	0500
12		GZH123			12,330	24.33	
13		GZH164			16,440	18.25	
14		GZH2	123	2,439			
15		GZH822			8,220	36.50	
16	Colombo	GZH123			12,330	24.33	0800
17		GZH164			16,440	18.25	
18		GBR	16	18,750			
19		GAY			8,910	33.67	
20	Rugby	GID			13,555	22.13	
21		GYC7			15,960	18.80	1200
22		GYB8			19,080	15.72	
23		GKU	149	2,013			
24		GZH2	123	2,439			
25		GZH822			8,220	36.50	
26	Colombo	GZH123			12,330	24.33	1300
27		GZH164			16,440	18.25	
28		GZH2	123	2,439			
29		GZH822			8,220	36.50	
30	Colombo	GZH123			12,330	24.33	1700
31		GZH164			16,440	18.25	
32		GBR	16	18,750			
33		GKU3			7,355	40.79	
34		GAY			8,910	33.67	
35	Rugby	GIH			10,650	28.17	2000
36		GID			13,555	22.13	
37		GYC7			15,960	18.80	
38		GKU	149	2,013			
39		GZH2	123	2,439			
40		GZH43			4,110	72.99	
41	Colombo	GZH822			8,220	36.50	2100
42		GZH123			12,330	24.33	

AREA 8

LIMITS OF AREA 8

(a) The following are the limits of Area 8—

Northern limit—a straight line joining position 11 degrees North and 110 degrees West to the coast of the American portion of the border of Mexico and Guatemala.

Southern limit—the South Pole.

Eastern limit—the West coast of the South American continent, and thence down the meridian of 74 degrees West.

Western limit—the meridian of 110 degrees West.

ZONE AND AREA STATIONS IN AREA 8

(b) The following are the Zone and Area Stations in Area 8—

Zone Station—Washington.

Area Stations: Balboa and the Falkland Islands.

TABLE 81

COASTAL STATIONS

The stations given in this table maintain constant watch on 500 kcs and, where indicated, are available for the transmission of "BAMS" messages using call signs and working waves shown in Col. 3.

Line No. (for reference only).	(Col. 1) Radio Station.	(Col. 2) Stations keeping constant watch on 500 kcs Call Sign.	(Col. 3) Stations transmitting "BAMS" messages. Call Sign.	Working Wave. Frequency (kcs).	Working Wave. Wavelength (meters).
1	Arica	CCA	CCA	150	2,000
2	Balboa, C.Z.	NBA	—	—	—
3	Talcahuano	CCT	CCT	150	2,000
4	Valparaiso	CCL	CCL	150	2,000

APPENDIX

A

BAMS ORGANIZATION

AREA

8

"BAMS" ROUTINES

Line No. (for reference only).	(Col. 1) Radio Station from which messages will be sent.	(Col. 2) Call Sign.	(Col. 3) L/F		(Col. 4) H/F		(Col. 5) Time (G.M.T.).
			Frequency (kcs).	Wavelength (meters).	Frequency (kcs).	Wavelength (meters).	
1	Balboa	NBA	148	2,027	17,090	16.96	0200
2					11,080	27.08	
3					5,515	54.40	
4	Falklands	VPC	125	2,400			0400
5					4,700	63.85	
6					8,555	35.06	
7	Washington	NSS	122	2,459	4,300	68.34	0500
8					9,425	31.83	
9					12,650	23.75	
10	Balboa	NBA	148	2,027	17,090	16.96	0800
11					11,080	27.08	
12					5,515	54.40	
13	Washington	NSS	122	2,459	4,300	68.34	1100
14					9,425	31.83	
15					12,650	23.75	
16	Falklands	VPC	125	2,400			1230
17					8,555	35.06	
18					17,110	17.50	
19	Balboa	NBA	148	2,027	17,090	16.96	1400
20					11,080	27.08	
21					5,515	54.40	
22	Falklands	VPC	125	2,400			1600
23					8,555	35.06	
24					17,110	17.50	
25	Washington	NSS	122	2,459	4,300	68.34	1700
26					9,425	31.83	
27					12,650	23.75	
28	Balboa	NBA	148	2,027	17,090	16.96	2200
29					11,080	27.08	
30					5,515	54.40	
31	Washington	NSS	122	2,459	4,300	68.34	2300
32					9,425	31.83	
33					12,650	23.75	

AREA 9

AREA 9

LIMITS OF AREA 9

(a) The following are limits of Area 9

AREA 9A—Mediterranean Sea, bounded by the Suez Canal and the meridian of Gibraltar.

AREA 9B—Red Sea bounded by the Suez Canal and the meridian of Aden.

ZONE AND AREA STATIONS IN AREA 9

(a) The following are the Zone and Area Stations in Area 9:—

AREA 9A Zone Station —Rugby.

Area Station —Malta.

AREA 9B Zone Station —Rugby

DIRECTION FINDING ORGANIZATION

The following D/F facilities are available to Merchant Ships in Area 9B.—

(a) *Aden*—The beacon operates continuously. Particulars are as follows—
Position—12° 55' 00" North, 44° 58' 01" East.
Frequency—[illegible] kcs [[illegible] metres].
Call sign—A D

(b) *Perim*—The beacon operates continuously. Particulars are as follows—
Position—[illegible]
Frequency—270 kcs [1,111 metres].
Call sign—P M

D/F [illegible]

(A)	Alexandria D/F Station (MSA)	Position two degrees NNE El Pin Light 490 feet. Application should be made through Alexandria. Radio Call Sign MSA on 500 kc/s. Ships are to be prepared to transmit on 405 kc/s.
(B)	Borge Piave D/F Station	Latitude 40 degrees 24 minutes 52 seconds N. Longitude 18 degs. 13 mins. 11 secs. E. Latitude 39 degs. 01 mins 25 secs. N. Longitude 17 degs 12 mins 10 secs. E. Application [illegible] Taranto Radio

APPENDIX

A

BAMS ORGANIZATION

AREA

9-A

TABLE 91

COASTAL STATIONS

The stations given in this table maintain constant watch on 500 kcs, and are available for the transmission of "BAMS" messages on the working waves indicated.

Line No. (for reference only).	(Col. 1) Radio Station.	(Col. 2) Call Sign.	(Col. 3) Working Wave.	
			Frequency (kcs).	Wavelength (meters).
1	Alexandria	MSA	490	610
2	Algiers	FUG	418	718
3	Beirut	FFD	495.8	605
4	Bizerta	FUX	464	647
5	Brindisi	ICE	482	694
6	Cagliari	IAJ	473	634
7	Constanza***	YQI	483.8	620
8	Gibraltar	GYW	470	638
9	Ismailia*	SUQ	400	750
10	Istanbul	TAH	439	683
11	Larnaca†	ZFE	447	671
12	Leghorn**	MJD	——	——
13	Maddalena	IBL	447	671
14	Malta	VPT	458	655
15	Marseilles	FFM	433	684.5
16	Naples	IQH	461	651
17	Odessa	AGC	——	——
18	Oran	FUK	460	652
19	Piraeus	GBV	——	——
20	Sevastopol	SWD	——	——
21	Taranto	ICT	484	647
22	Toulon	FUO	——	——

* Receives on 425.5 kcs (705 meters) or 411 kcs (730 meters).
** Keeps watch on 500 kcs (600 meters) when ships are due.
*** Receives on 454.5 kcs (660 meters).
† Does not maintain constant watch. See the Items List for times of watch.

TABLE 92

"BAMS" ROUTINES

Line No. (for reference only).	(Col. 1) Radio Station from which messages will be sent.	(Col. 2) Call Sign.	(Col. 3) L/F		(Col. 4) H/F		(Col. 5) Time (G.M.T.).
			Frequency (kcs).	Wavelength (meters).	Frequency (kcs.)	Wavelength (meters.	
1		GBR	16	18,750			
2		GKU4			4,025	74.53	
3	Rugby	GKU1			7,355	40.79	0000
4		GAY			8,910	33.67	
5		GKU	149	2,013			
6		GYZ2	128	2,344			
7	Malta	GYZ5			5,340	56.18	0600
8		GYZ10			10,620	28.25	
9		GBR	16	18,750			
10		GAY			8,910	33.67	
11		GID			13,555	22.13	
12	Rugby	GYC7			15,960	18.80	1200
13		GYB8			19,080	15.72	
14		GKU	149	2,013			
15		GYZ2	128	2,344			
16	Malta	GYZ5			5,340	56.18	1700
17		GYZ10			10,620	28.25	
18		GBR	16	18,750			
19		GKU1			7,355	40.79	
20		GAY			8,910	33.67	
21	Rugby	GIH			10,650	28.17	1000
22		GID			13,555	22.13	
23		GYC7			15,960	18.80	
24		GKU	149	2,013			

AREA 9-B

TABLE 93

COASTAL STATIONS

The stations given in this table maintain constant watch on 500 kcs, and are available for the transmission of "BAMS" messages on the working waves indicated.

Line No. (for reference only).	(Col. 1) Radio Station.	(Col. 2) Call Sign.	(Col. 3) Working Wave.	
			Frequency (kcs).	Wavelength (meters).
1	Aden	GZO	[illegible]	624
2	Alexandria	MSA	480	625
3	Ismailia*	SUQ	[illegible]	[illegible]
4	Kuwait	[illegible]	[illegible]	[illegible]
5	Port Sudan	[illegible]	433	700

* Receives on [illegible] kcs (385 m.) or 433 kcs (730 m.).
[illegible]

TABLE 94

"BAMS" ROUTINES

Line No. (for reference only).	(Col. 1) Radio Station from which messages will be sent.	(Col. 2) Call Sign.	(Col. 3) L/F		(Col. 4) H/F		(Col. 5) Time (G.M.T.).
			Frequency (kcs).	Wavelength (meters).	Frequency (kcs).	Wavelength (meters).	
1	Rugby	GBR	16	18,750			0000
2		GKU4			4,025	74.53	
3		GKU1			7,355	40.79	
4		GAY			8,910	33.67	
5		GKU	149	2,013			
6	Rugby	GBR	16	18,750			1100
7		GAY			8,910	33.67	
8		GID			13,555	22.13	
9		GYC7			15,960	18.80	
10		GYH8			19,080	15.72	
11		GKU	149	2,013			
12	Rugby	GBR	16	18,750			2000
13		GKU1			7,355	40.79	
14		GAY			8,910	33.67	
15		GIH			10,650	28.17	
16		GID			13,555	22.13	
17		GYC7			15,960	18.80	
18		GKU	149	2,013			

Note: All traffic for ships in Area 9B will be transmitted via Rugby or Coastal Stations in Table 93.

WATCHKEEPING PERIODS FOR SHIPS WITH ONE OR TWO RADIO OPERATORS

(ALL TIMES G.M.T.)

SAMS Area	Single Operator	Two Operator
1A	0600 — 0700 1000 — 1100 1300 — 1400 1500 — 1600 1800 — 2100 2200 — 2300	2200 — 0300 0600 — 0900 1000 — 1300 1400 — 1600 1800 — 2100
1B	Same as 1A	Same as 1A
2A	0100 — 0200 0830 — 1200 1300 — 1400 1700 — 1800 2130 — 2400	0300 — 0700 0900 — 1500 1700 — 1900 2100 — 0300
2B	0800 — 1000 1100 — 1300 1400 — 1500 1700 — 1900 2200 — 2400	0300 — 0400 0500 — 0700 0800 — 1030 1100 — 1300 1400 — 1600 1700 — 2000 2200 — 0100
3A	0730 — 0830 1030 — 1300 1600 — 1700 1900 — 2130 2230 — 2330	2330 — 0330 0430 — 0600 0730 — 0930 1030 — 1430 1600 — 1800 1900 — 2130
3B	0600 — 0130 0900 — 1030 1200 — 1400 1700 — 1800 2000 — 2200	0000 — 0300 0500 — 0800 0900 — 1100 1200 — 1500 1700 — 1900 2000 — 2300
3C	0000 — 0130 0530 — 1030 1200 — 1300 1330 — 1430 1730 — 1830 2000 — 2130	0000 — 0300 0530 — 0830 0930 — 1130 1200 — 1500 1730 — 1930 2000 — 2300
4	0630 — 0730 1100 — 1200 1300 — 1430 1600 — 1800 2030 — 2130 2300 — 0030	2000 — 0300 0400 — 0800 1100 — 1400 1600 — 1800
5A	0100 — 0200 0400 — 0500 0700 — 0800 1600 — 2000 2200 — 2300	0100 — 0300 0400 — 0600 0700 — 0900 1000 — 1200 1500 — 1600 1600 — 2000 2200 — 0000
5B	Same as 5A	Same as 5A
5C	Same as 5A	Same as 5A
6A	Same as 5A	Same as 5A
6B	Same as 5A	Same as 5A
6C	Same as 5A	Same as 5A
6D	Same as 5A	Same as 5A
7A	0500 — 0630 0800 — 0900 1200 — 1430 1700 — 1800 2000 — 2200	0000 — 0400 0500 — 0700 0800 — 1000 1200 — 1500 1700 — 1900 2000 — 2300
7B	Same as 7A	Same as 7A
7C	Same as 7A and 7B	Same as 7A and 7B
8	0200 — 0300 1100 — 1300 1400 — 1500 1600 — 1800 2200 — 2400	0200 — 0500 0600 — 1000 1100 — 1500 1600 — 1900 2200 — 0100
9A	0600 — 0700 0800 — 1000 1200 — 1400 1600 — 1800 2000 — 2200	0400 — 0700 0800 — 1100 1200 — 1500 1700 — 1900 2000 — 0200
9B	0600 — 0200 0800 — 1000 1200 — 1400 1900 — 2200	0000 — 0300 0400 — 0700 0900 — 1100 1200 — 1500 1600 — 1900 2000 — 2200

RADIO TIME SIGNALS

TABLE 1

British Radio Station Rugby transmits time signals as follows:

Time (G.M.T.)	Call Sign	Frequency (kcs)	Wavelength (metres)
	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	16,750
	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]

(a) The period of each transmission extends from 5 min. 45 sec. preceding the above time. The preparatory signals, commencing at approximately 0954 and 1754 G.M.T. respectively, consist of the call sign (made four times) followed by a continuous dash of 50 to 60 seconds' duration (tuning signal).

(b) The Modified Rhythmic System is used. This comprises a series of 300 signals emitted in 300 seconds of Mean Time, the concluding signal being the exact minute. In each series, signals Nos. 1, 11, 121, 181, 241 and 301 are single dashes (–) of 0·4 sec. duration and commence at the exact minute. Each dash is followed by 99 dots (.) of 0.1 sec. duration.

Example of procedure:—

0955 G.M.T. Signal No. 1.	A dash (–) followed by 59 dots (. . . etc.).
56 G.M.T. Signal No. 61.	A dash (–) followed by 59 dots (. . . etc.).
57 G.M.T. Signal No. 121.	A dash (–) followed by 59 dots (. . . etc.).
58 G.M.T. Signal No. 181.	A dash (–) followed by 59 dots (. . . etc.).
59 G.M.T. Signal No. 241.	A dash (–) followed by 59 dots (. . . etc.).
1000 G.M.T. Signal No. 301.	A dash (–).

(c) For ordinary navigational purposes, a comparison obtained by disregarding the dots and using the commencements of the dashes only (given at the exact minute) will be sufficiently accurate.

TIME SIGNALS

TABLE 2

U. S. Navy Radio Stations transmit time signals as follows:

Time (G.M.T.).	STATION.	Call Sign.	Frequency (kcs).	Wavelength (meters).
0055 to 0100	San Francisco, Calif.	NPG	115	2,608
			9,255	32.42
			12,540	23.92
0355 to 0400	Washington, D. C.	NSS	122	2,458
			4,390	68.34
			9,425	31.83
			12,630	23.75
	Oahu, T. H.	NPM	16.68*	17,974
			9,090	33.00
			14,380	17.27
			17,370	20.86
0455 to 0500	Balboa, C. Z.	NBA	148	2,027
			5,515	54.40
			11,080	27.08
0755 to 0800	San Francisco, Calif.**	NPG	115	2,608
			9,255	32.42
			12,540	23.92
0955 to 1000	Washington, D. C.	NSS	122	2,458
			4,390	68.34
			9,425	31.83
			12,630	23.75
1455 to 1500	San Francisco, Calif.	NPG	115	2,608
			9,255	32.42
			12,540	23.92
1555 to 1600	Washington, D. C.	NSS	122	2,458
			4,390	68.34
			9,425	31.83
			12,630	23.75
	Oahu, T. H.	NPM	16.68*	17,974
			4,525	66.30
			9,090	33.00
			14,380	20.86
1655 to 1700	Balboa, C. Z.	NBA	148	2,027
			2,170	138.2
			5,515	54.40
			11,080	27.08
	San Francisco, Calif.**	NPG	115	2,608
1955 to 2000	Oahu, T. H.**	NPM	16.68*	17,974
			9,090	33.00
			14,380	20.86
			17,370	17.27
	San Francisco, Calif.**	NPG	115	2,608
2155 to 2200	Washington, D. C.	NSS	122	2,458
			4,390	68.34
			9,425	31.83
			12,630	23.75
2355 to 2400	San Francisco, Calif.**	NPG	115	2,608

*56 kcs is standby frequency for 16.68 kcs. In the event of failure of the latter frequency 56 kcs will automatically substitute therefor. To provide for necessary servicing, 16.68 kcs transmitter is secured from 2200 Wednesdays to 0300 Thursdays; during this period 56 kcs will be utilized.

All time signals are first-order time signals except those marked by a double asterisk which are second order. First-order time signals are precision time signals for chronometer rating and scientific use, normally correct as broadcast to less than one-tenth of a second.

The average error of the Washington time signals has been reduced to less than .02 of a second.

**Second-order time signal.—These are time signals for chronometer rating and ordinary use, normally correct as broadcast to less than five-tenths of a second, having a generally constant lag.

In the event of a failure or an error occurring in any of the time signals, except the rebroadcast of Washington time signals at San Francisco and Pearl Harbor, T. H., another time signal will be transmitted a few minutes later on the same frequency. San Francisco, in the event of a failure or error occurring in the Washington time signal, will transmit a time signal from the clock at that point.

TABLE 1

TIME SIGNALS FROM COASTAL STATIONS

The following Coastal Stations now transmit a Time Signal on a frequency of 500 kcs:—

(Col. 1) BAMS Area	(Col. 2) W/T Station	(Col. 3) Times of Emission	
		(B.S.T., or B.D.S.T.)	
1A	Wick	0850*	0950
	Cullercoats	1350	1850
	North Foreland	0850*	1750
	Niton	1350	1850
	Lands End	0850*	0950
	Portpatrick	1350	1750
		(G.M.T.)	
2A	Amagansett	0450	1650
	Charleston	0450	1650
	Bermuda	0450	1650
	Miami	0450	1650
	San Juan	0550	1750
2B	Trinidad	0550	1750
	Barbados	0350	1650
	Balboa	0550	1750
	Georgetown	1150	2350
	Ascension	1350	1850
3A	Freetown	1150	1950
	Lagos	0850	1250
3B	Simonstown	0950	1850
3C	Durban	1350	2250
	Diego Suarez	0250	1850
5A	Darwin	0950	2250
5B	Perth, Bunbury, Sydney, Melbourne, Hobart, Adelaide	0950	2250
5C	Townsville, Thursday Island, Darwin	0950	2250
5D	Darwin	0950	2250
6A	Hillsboro	0350	1350
6B	Palo Alto	0350	1350
6C	Auckland, Suva, Wellington	0350	2250
7A	Aden	0850	1350
	Bahrein	0350	2350
	Bombay	0450	1750
	Calcutta	0450	1250
	Colombo	0250	1350
	Diego Suarez	0250	1850
	Karachi	0750	1550
	Khindia	1150	2050
	Madras	1050	2250
7B	Diego Suarez	0250	1850
	Mauritius	0050	1450
8	Belboa	0550	1750

Note: Approximately two minutes before the transmission of a time signal, the Coastal Station will transmit a preamble en clair. The time signals which follow this preamble should be accurate to approximately one second but should not be used for checking chronometers, etc., if standard time signals are available.

*0950 on Sundays.

RECEIVER COMBINATIONS APPROVED

1. The following receiver combinations have been approved by Admiralty

RECEIVER COMBINATIONS APPROVED FOR USE ON MERCHANT SHIPS

COMMUNICATION RECEIVERS

Manufacturers	Type No.	Additional Units required (if any)	Frequency range (kcs)	Remarks
Marconi Co.	325A	Buffer unit 763	15-25,000	
Marconi Co.	352	Buffer unit 763 and H.F. unit 740	15-20,000	
Marconi Co.	352A	Buffer unit 763 and H.F. unit 740	15-20,000	Additional coil extends to 25,000 kcs.
Marconi Co.	560	Buffer unit 763	15-25,500	
Marconi Co.	596	Buffer unit 763	15-20,000	
Marconi Co.	730	Buffer unit 763 and 763 N. Y.	15-25,000	
Marconi Co.	732	Buffer unit 763	15-26,000	
Marconi Co.	394	None	150- 3,000	
Marconi Co.	394A	None	160- 2,750	
Marconi Co.	394F	None	100- 4,500	
Marconi Co.	521	None	3,700-22,000	
Marconi Co.	950	None	150- 3,333	
Marconi Co.	C. R. 100	None	60- 420 500-30,000	Usually fitted in Admiralty ships.
Marconi Co.	C.R. 300	None	15-25,500	
Marconi Co.	C.N.Y.1.	None	400- 1,000 1,500- 9,000	
Marconi Co.	C.N.S.1.	None	8,000-30,000	
Marconi Co.	711	Marconi Buffer Type 771	150- 3,333	
Marconi Co.	394E	None	150- 3,160	
Marconi Co.	394G	None	100- 8,500	
Marconi Co.	T.V.5	Special Buffer Unit 869	400- 3,000	
Marconi Co.	R.C. 64	None	3,000-24,000	Accepted provided the receiver is not operated while at sea with the back open and the screening removed.
Marconi Co.	R.B.5E	S.A.I.T. Buffer Unit 35/E (modified)	150-25,000	
Marconi Co.	T.V. 5/883	None	400- 1,000 1,500- 4,000 4,000-10,000	
Norsk Marconi Co.	374A	Buffer Unit 763	15- 3,750 6,000-15,000	
Norsk Marconi Co.	374A	Suppressor S.R.1	15- 3,750 6,000-15,000	
Norsk Marconi Co.	367	Suppressor S.R.1	3,727-20,000	
Siemens Bros.	83	Marconi Buffer 763 and Marconi H.F. Unit 740	15-20,000	
Siemens Bros.	173A	Marconi Buffer 763 or Siemens Buffer 174	15-25,000	
Siemens Bros.	173AB	Siemens Buffer 174	3,727-25,000	
Siemens Bros.	183	Siemens Buffer 174	2,700-25,000	
Siemens Bros.	S.B.133B (with or without preselector) S.B.134B	None	75- 750	
Siemens Bros.	S.B.135C	None	13- 100	
Siemens Bros.	S.B.183	Siemens Buffer 174 or 174A	2,700-25,000	

RECEIVER COMBINATIONS APPROVED FOR USE ON MERCHANT SHIPS (continued)

COMMUNICATION RECEIVERS (continued)

Manufacturers	Type No.	Additional Units required (if any)	Frequency range (kcs)	Remarks
Siemens Bros.	S.R.181	Marconi Buffer 763	2,706-25,000	
Siemens Bros.	S.R.321	None.	1,154- 3,000	
			166- 1,000	
Siemens Bros.	S.R.421	None	166- 3,000	
Siemens Bros.	S.R.371	None	166- 3,000	
			Spot 16 kcs	
Int. Marine Radio Co.	R.M.5	Suppressor S.R.1	15-20,000	
Int. Marine Radio Co.	R.M.5B	Suppressor S.R.1	15-20,000	
Int. Marine Radio Co.	R.M.15	Suppressor S.R.1	15-21,500	
Int. Marine Radio Co.	R.M.15C	Suppressor S.R.1	15-21,500	
Int. Marine Radio Co.	R.M.4	None	150- 2,500	
Int. Marine Radio Co.	R.M.14	None	150- 2,732	
Int. Marine Radio Co.	S.C.R.30	None	143- 3,000	
Int. Marine Radio Co.	R.5.1	None	13- 8,108	
Int. Marine Radio Co.	R.M.Y.	None	75- 1,200	
Int. Marine Radio Co.	R.M.Z.	None	135- 1,250	
Int. Marine Radio Co.	R.M.3	S.R.1	3,530-20,000	
Int. Marine Radio Co.	R.M.15B	Suppressor S.R.1	15-20,000	
Int. Marine Radio Co.	R.M.X.	Suppressor Unit S.R. 1 and S.R. 2	1,200- 23,000	
Int. Marine Radio Co.	R.M.15D	Suppressor Unit Type S.R.1	15-25,000	
Int. Marine Radio Co.	R.M.10	Suppressor Unit Type S.R.2	540- 2,250	
Brocklehank	H.P.3	Brocklehank Buffer H.P.1	1,000-25,000 300- 600	
Brocklehank	1939	Buffer H.P.1	1,000-25,000 300- 600	
Brocklehank	1940	None	15- 143 100- 1,000	
Brocklehank	A.C.1940	None	10- 1,010	
Brocklehank	A.C.1944	None	1,000-20,000	
Gambrell	525	Brocklehank Buffer H.P.1 or Marconi Buffer 763 or Redifussion Buffer Type 3	15-22,000	
Gambrell	579	Buffer H.P.1	3,000-30,000	
S.A.I.T.	35C/D	Marconi Buffer 763 or S.A.I.T. Buffer 35K	15-25,000	
S.A.I.T.	35B	S.A.I.T. Buffer 35E	15-25,000	
S.A.I.T.	35C	S.A.I.T. Buffer 35E	15-25,000	
S.A.I.T.	R.O.M. 30	None	100- 3,333	
S.A.I.T.	R.O.C. 20	Marconi Buffer 771A	1,500-25,000	
S.A.I.T.	R.O.C. 20	S.A.I.T. Buffer 35E	1,500-25,000	
S.A.I.T.	R.U.W.	None	15-25,000	
C.R.M. (French)	C.R.M.8B	None	.....	
Rediffusion, Ltd.	661	None	160- 3,400	
Rediffusion, Ltd.	667	Rediffusion Buffer Unit, Type 1	150- 333.3 565- 1,500 4,360-25,077	
Radio Holland	U.O.H.L.7K	Marconi Buffer 763	15-21,000	
Radio Holland	U.O.H.L.7	Marconi Buffer 763	14.3-20,000	
*Telefunken	E.381S	None	14.6-20,000	When used with Telefunken valves, type R.E.(S) 054 (Met.) and R.E.084.
*Telefunken	E.381S	Marconi Buffer unit, Type 763	14.6-20,000	When used with Marconi valves S.410 and H.L.410.

*These acceptances have been given subject to the tubes (valves) in use being all Telefunken or all Marconi. A mixture of both is not admissible.

RECEIVER COMBINATIONS APPROVED FOR USE ON MERCHANT SHIPS (continued)

COMMUNICATION RECEIVERS (continued)

Manufacturers	Type No.	Additional Units required (if any)	Frequency range (kcs)	Remarks
*Telefunken	E.381H	None	14.6-30,000	When used with Telefunken valves, types R.E.(S)094, and R.E. 084.
*Telefunken	E.381H	Marconi Buffer unit, Type 763	14.6-30,000	When used with Marconi valves, S.410 and H.L.410.
Norwegian Receiver	S.S.M./4	Marconi Buffer 771A	14.28-30,000	
Norsk Telefunken	U.M.1	Buffer Unit 763	15- 1,111 1,765-30,000	
Svenska Telefunken	M.K. 31	Suppressor S.R.1	1,500-30,000	
Svenska Telefunken	M.L.37	None	15- 345 375- 1,270 1,470- 1,970	
Norwegian Receiver Lehmkuhl	L.M. 8	None	14-31,000	

RECEIVERS USED FOR SECOND CHANNEL RECEPTION

Marconi Co.	763	None	470- 530	Identical with Siemens S.193 and I. M. R. D.B.D. R.R.21, R.R. 21, Radio Holland 600 M.
Marconi Co.	763B	None	470- 530	
Marconi Co.	763C	None	470- 530	
Marconi Co.	784	None	470- 530	
Marconi Co.	552	None	1,300- 3,727 384-7-500	Without goniometer.
Marconi Co.	Auto-Alarm M.	None	488- 513	
Marconi Co.	All types D.F.	None		When associated with loops and normal sense aerial.
Siemens Bros.	S.193	None	470- 530	Identical with Marconi 763 and 784 I.M.R. D.B.D. R.R.21, R.R. 21 and Radio Holland 600 M.
Siemens Bros.	S.B.138	None	500	
Siemens Bros.	S.B.138A	None	500	
Siemens Bros.	D.F.109			
Siemens Bros.	109A			
Siemens Bros.	119	None	250- 600	When used with associated loops.
Siemens Bros.	139			
Siemens Bros.	149			
Siemens Bros.	1403			
Siemens Bros.	Receiver Selector S.B. 218	None	500	Auto-alarm.
Siemens Bros.	S.B. 85	Siemens Buffer S.B. 174		May be used for second channel reception on frequencies not higher than 1,500 kcs, provided that coil C.T. 4 only is used.

APPENDIX

D

RECEIVER COMBINATIONS APPROVED

RECEIVER COMBINATIONS APPROVED FOR USE ON MERCHANT SHIPS (continued)

RECEIVERS USED FOR SECOND CHANNEL RECEPTION (continued)

Manufacturers	Type No.	Additional Units required (if any)	Frequency range (kcs)	Remarks
~~Siemens Bros.~~	Selector or S.B. 210	~~None~~	~~500~~	
Int. Marine Radio Co.	R.C. 2B	None	380- 600	D/F.
Int. Marine Radio Co.	D.B.D.	None	470- 550	Identical with Marconi 765 and Siemens S.193.
Int. Marine Radio Co.	A.A. 1	None	500	Auto Alarm.
Int. Marine Radio Co.	Auto-alarm, Type A.A. 2B	None	500	
Int. Marine Radio Co.	R.C. 2C	None	272- 667	D/F.
Radio Holland	Type 600 M.	None	470- 550	Identical with Marconi 765 and 784 I.M.R. D.B.D. and Siemens S. 193, except that a loudspeaker has been incorporated in the same receiver case.
Inter. Marine Radio Co.	Type R.R.21	None	470- 530	
Inter. Marine Radio Co.	Type R.R.22	None	470- 530	
Pedersen	B.39	None	300-500	D/F.

BROADCAST RECEIVERS

Marconi Co.	365	Marconi Buffer, Type 771	545-23,070 150-375
Marconi Co.	367	Marconi Buffer, Type 771	545-23,070 150-375
Marconi Co.	368	Marconi Buffer, Type 771	545-23,070 150-375
Marconi Co.	397	Marconi Buffer, Type 771	5,350-28,040 400-2,400 100-250
Marconi Co.	712	Marconi Buffer, Type 771	5,357-28,037
Marconi Co.	713	Marconi Buffer, Type 771	400-2,542 100-250
Siemens Bros.	R.R.14	Marconi anti-static aerial, Type 72	3,333-20,690 545.5-1,500 187.5-375
Rees Mace	M.N.100A	None	7,000-22,200 2,100-7,200 550-1,700
Electrical & Musical Instruments	827	None	3,333-23,077 526- 1,578

RECEIVER COMBINATIONS APPROVED FOR USE ON MERCHANT SHIPS (continued)

2. The following receiver combinations have been approved by the Federal Communications Commission, Washington, under United States regulations, and have been accepted as meeting the requirements of S.R. & Os. 1284/41 and 265/45. This approval was given upon the condition that normal circumstances of operation, including applied voltages and electron tubes, will be maintained whenever the equipment is in use or operation.

COMMUNICATION RECEIVERS

Manufacturers.	Type or Model Number.	Frequency Range (kcs).
Ameseen Electric Company	841LW	80-550
Federal Telephone & Radio Corp. (Formerly Federal Telegraph Co.)	Mackay Radio & Telegraph Co.	16-40
	117-C	100-200 300-530
	128-A	16-650
	128-AX	15-650
	130-A	300-500
	138-A	80-500 1,000-25,000
Globe Wireless or Heintz & Kaufman	530	70-210 350-515
Hallicrafters, Inc.	SX-28A**	540-40,000
National Company	D.C. SW-3RM	100-600
Radiation Products Corporation	R-98-SR	100-500 1,500-12,000
Radio Corporation of America	AR-88	535-32,000
	AR-87-X	75-1,500
	CR-91	75-550 1,500-30,000
Radiomarine Corporation of America	AR-8503	15-600
	AR-8507	70-515
	AR-8519	15-650
	AR-8506-A	210-550 1,000-25,000
	AR-8506-B	90-550 1,000-25,000
E. M. Sargent	AH-10X	34-550
E. H. Scott Radio Labs.	SLR-C	80-530 3,000-24,000
	SLR-D	500-24,000
	SLR-F	80-550 1,000-24,000
	SLR-H	530-15,600
Technical Radio Company	LRR-4	1,500-18,000
Western Electric Company	Standard receivers incorporated in radio-telephone equipment types	
	224-A	2,100-2,800
	*224-B	2,100-2,800
	226-A	2,100-2,800
	226-B	2,100-2,800
	226-C	2,100-2,800
	226-D	2,100-2,800

* When modified in accordance with manufacturer's instructions and such modification is designated by the addition of the letter "M" to the serial number of the modified receiver.

** When used with radiation suppressor unit No. 12381.

RECEIVER COMBINATIONS APPROVED FOR USE ON MERCHANT SHIPS
(continued)

BROADCAST RECEIVERS

Manufacturers	Type or Model Number	Frequency Range (kc).
Mohawk and Radiomes Corporation	AR-93	540-1,600
	AR-93A	540-1,600
Maritime Radio Corporation	MA-1	500-1,500
	*MA1-A	500-1,500
	*MA1-B	500-1,500
Radio Corporation of America	[illegible]	535-32,000
E. H. Scott Radio Labs.	[illegible]	540-1,600
	[illegible]	1,550-15,000
	[illegible]	540-1,600
		1,550-15,000

DIRECTION FINDERS

[illegible]	Standard Pioneer	
	DF-1009	[illegible]
	DF-1011	[illegible]
	DF-1012	[illegible]
	DF-1013	[illegible]
	DF-1014	[illegible]
	DF-1015	[illegible]
	DF-1016	[illegible]
	DF-1017	[illegible]
	DF-1018	[illegible]
	DF-1019	280-520
	DF-1020	280-520
	[illegible]	280-520
	[illegible]	280-520
	DF-1025	[illegible]
[illegible]	Morkay Radio & Tele., Co.	
	101-A & B	[illegible]
	103-A & B	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]
	AM-[illegible]-EM	[illegible]
	AM-[illegible]-F	[illegible]
[illegible]	ER-1443-A	280-525
	ER-1443-B	280-525
	ER-1443-B	280-525
	AR-[illegible]	[illegible]
	AR-6701	270-520
	AR-6702	270-520
	AR-6707-A	270-520
	AR-[illegible]	270-520
	AR-6704	270-520
	AR-[illegible]	270-520
	AR-[illegible]-ASX	270-520
	AR-[illegible]-AX	270-520
	AR-[illegible]-AX	270-520
	AR-[illegible]-BX	270-520
	AR-[illegible]-BX	270-520
	AR-6707-X	[illegible]
	AR-6707-X1	[illegible]

*Identical to electrical design to model MA-1.

RECEIVER COMBINATIONS APPROVED FOR USE ON MERCHANT SHIPS (continued)

AUTO-ALARMS

Federal Telephone & Radio Corp. (Formerly Federal Telegraph Co.)	Mackay Radio & Telegr. Co.	
Radiomarine Corporation of America	AR-8606-X AR-8601	500 500

3. Canadian Receiver Combinations.—The following types of receiver equipment have been approved by the Canadian authorities as complying with their requirements regarding the limitation of radiation, and have been accepted by the Admiralty as meeting the requirements of S.R. & Os. 1284/41 and 265/45.

Manufacturers	Type Number	Frequency Range (kcs)	Remarks
Canadian Marconi			Also based on U.K.
Canadian Marconi		1,500-30,000	
Canadian Marconi			
Canadian Marconi			

4. Receiver Combinations Approved by the Australian Commonwealth Naval Board.—The following Communication Receivers have been approved by the Australian Commonwealth Naval Board as complying with their requirements as regards the limitation of radiation, and have been accepted by the Admiralty as meeting the requirements of S.R. & Os. 1284/41 and 265/45.

Manufacturers	Type Number	Additional Units Required (if any)	Frequency Range (kcs)	Remarks
Amalgamated Wireless (Australasia) Ltd.	C99	Tuned Buffer	488–513	Auto-Alarm Receiver
	C83	None	100–1,000	T.R.F.
	C143	None	176–2,000	D.F. Receiver R.F. stage.
	C143A	None	166–2,000	D.F. Receiver R.F. stage.
	C143B	None	176–2,000	D.F. Receiver R.F. stage.

APPENDIX

D RECEIVER COMBINATIONS APPROVED

RECEIVER COMBINATIONS APPROVED FOR USE ON MERCHANT SHIPS (continued)

Manufacturers	Type Number	Additional Units Required (if any)	Frequency Range (kcs)	Remarks
Amalgamated Wireless (Australasia), Ltd. —contd.	C146	See remarks	100–20,000	T.R.F. No buffer unit required when used without long wave converters M.R.4B or C.173.
	C160	None	150–1,100	T.R.F.
	C164	Tuned Buffer	150–1,100	T.R.F.
	C167, C168, C168A	None	200–2,000	Superheterodyne R.F. stage.
	C171A	None	100–1,622	T.R.F.
	C173	Tuned Buffer	10–120	Long-wave converter.
	CD375	Tuned Buffer	375–3,000	Reinartz circuit (Regenerative)
	397T	None	185–1,600	D.F. receiver.
	C.D.1184	Tuned Buffer	300–3,000	T.R.F. (first stage regenerative).
	C.1485	None	1,500–30,000	Superheterodyne H.F. stage.
	C.1459	Tuned Buffer	15–100	Long-wave converter.
	C.2130	None	250–1,500	7-valve superheterodyne R.F. stage.
	C.3487	None	200–515 and 2,855–27,000	Superheterodyne R.F. stage.
	1.C.3487	None	100–1,700	6-valve superheterodyne R.F. stage.
	2.C.3487	None	100–1,700	6-valve superheterodyne.
	3.C.3487	None	Not known	6-valve superheterodyne R.F. stage.
	4.C.3487, 5.C.3487, 6.C.3487, 7.C.3487	None	Not known	6-valve superheterodyne R.F. stage.
	4874	None	Not known	6-valve superheterodyne R.F. stage.
	1.C.4874	None	100–1,700	6-valve superheterodyne R.F. stage. Also tested in U.K.
	2.C.4874	None	1,500–25,000	6-valve superheterodyne R.F. stage. Also tested in U.K.
	3.C.4874	None	200–8,571	6-valve superheterodyne R.F. stage.
	4.C.4874	None	1,100–1,700	6-valve superheterodyne R.F. stage.
	5.C.4874	None	Not known	6-valve superheterodyne R.F. stage.
	6.C.4874	None	Not known	5-valve superheterodyne R.F. stage incorporated.
	C.5439	None	100–18,750	Superheterodyne R.F. stage.
	J.5483	None	1,570	Transceiver combination.
	C.6940	Tuned Buffer	15–117	Single channel superheterodyne. R.F. stage incorporated. This receiver covers the range in two sections, but the H.F. valve is used in one section only.
	1.C.6940	None	100–3,000	Superheterodyne R.F. stage.
	2.C.6940	None	1,500–25,000	Superheterodyne R.F. stage.
	M.R.4B	Tuned Buffer	Unknown	Long-wave converter. Regenerative single valve.
Collier and Beale (New Zealand).	S.N.31/37	None	100–1,000	T.R.F.
	38	None	100–1,000	T.R.F.

RECEIVER COMBINATIONS APPROVED FOR USE ON MERCHANT SHIPS (continued)

5. Receiver Combinations Approved by the New Zealand Naval Board.—The following types of receiver equipment have been notified to the Admiralty as complying with the New Zealand Naval Board's requirements regarding the limitation of radiation:—

Manufacturers	Type Number	Frequency Range (kcs)	Remarks
Radio Corporation (N.Z.), Ltd.	M.1 M.2	8,000–15,000 4,000–15,000	
Collard & Beale, Ltd., Wellington, N.Z.	641 M.W.B.1 641 M.W.B.2	220–980 220–980	
Radio 1934 Ltd. (N.Z.)	Auckland S.M.V.L.	[illegible]–1,600	

Although these receivers have been notified, it is understood that the New Zealand authorities test and accept each individual installation as regards radiation, and usually associate with each receiver a certificate stating that it conforms with the Admiralty requirements in respect of radiation.

D/F CALIBRATION FACILITIES

A. BRITISH

BAMS AREA	PORT	PARTICULARS
1A	Greenock Barrow Devonport	Application should be made to the N.C.S.O., giving 24 hours' notice.
	Humber Rosyth	Application should be made to the N.C.S.O., giving three days' notice.
	Oban	Application should be made to the N.C.S.O., giving as much notice as possible. Ships proceeding to Oban from Methil should make application to N.C.S.O., Methil, who will make the necessary arrangements with N.C.S.O., Oban.
	Bristol Channel Ports	Application should be made to the N.C.S.O. of the port concerned giving at least 24 hours' notice.
	Belfast Lough	Application should be made to the N.C.S.O., Belfast, giving 48 hours' notice.
	Methil	Application should be made to the N.C.S.O., giving at least six hours' notice.
	Southampton	Application should be made to the N.C.S.O., giving at least 24 hours' notice.
1B		
1A	Halifax (N.S.) Sydney (N.S.) St. John (N.B.) St. John's (Nfld.)	Application should be made to the N.C.S.O.
1B	Bermuda	Application should be made to the British Routing Liaison Officer giving 24 hours' notice. Calibration is carried out by Cables and Wireless, Ltd. A beacon, sending characteristic dashes on 333 kcs for three seconds followed by one second's silence in position 32° 22' 57" N., 64° 40' 08" W., is available for calibration checks by ships' Radio Officers.
	Jamaica	Application should be made through the shipping agents. Calibration is carried out by Cables and Wireless, Ltd. Only limited facilities exist.
3B	Freetown	Application should be made to the N.C.S.O.
	(i) Capetown	Application should be made to the N.C.S.O., Capetown, for use of the transmitter at the Port War Signal Station. The signal "UD" hoisted inferior to the Code Pendant, when flown by a ship in Table Bay, means "Am calibrating Radio Direction Finder."
	(ii) Capetown Broadcasting Station	Position of mast, 33° 52' 35.5" S., 18° 30' 31.4" E. Ships in Table Bay can use this station at any time on 600 kcs. The signal "UD" hoisted inferior to the Code Pendant, when flown by a ship in Table Bay, means "Am calibrating Radio Direction Finder."
	Simonstown	Application should be made to the Commodore-in-Charge, Simonstown. Ships calibrated in False Bay, using Simonstown Radio Station.
3C	Durban	Application should be made to the N.C.S.O., Durban, for use of the transmitter at the Port War Signal Station Bluff (Call Sign ZKV—frequency 350 kcs).
4	Montevideo	Application should be made to the British Routing Liaison Officer—at Buenos Aires or Montevideo. Position of Station.....Lat. 34° 54' 45" S. Long. 56° 12' 43" W. Call Sign.....CWM Frequency.....311 kcs (965 meters).

A. BRITISH—(Continued)

BASE AREA	PORT	PARTICULARS
5A	Fremantle	Application should be made to the N.C.S.O., giving 48 hours' notice and stating the type of D/F to be calibrated, and the date and time the ship will be available.
5B	Melbourne Sydney	Application should be made to the N.C.S.O., giving 48 hours' notice and stating the type of D/F to be calibrated and the date and time the ship will be available.
5C		
6A	Esquimalt (B.C.) Prince Rupert (B.C.) Vancouver (B.C.)	Facilities for calibration will shortly be available, when the necessary procedure will be promulgated.
6B		
6C	Auckland (N.Z.) Wellington (N.Z.)	Application should be made to the N.C.S.O. at the base. Calibration is effected by use of Radio Beacons.
6D		
7A	Bombay	Application should be made to the N.O.I.C., Bombay, giving not less than 48 hours' notice.
	Colombo	Application should be made to the N.C.S.O., giving as much notice as possible. The station will transmit call sign GZHO on 450 or 500 kcs. Use of the signals should normally be made on entering or leaving harbor. Ships calibrating or checking D/F should swing to a position from two to three miles due west of the Port War Signal Station from which visual bearings should be taken. Ships are not to close the station to less than two miles.
	Kilindini Diego Suarez Khor Kuwai	Calibration can only be undertaken by special arrangements made with the Naval Authorities at these bases.
7B		
8		
8A	Alexandria Suez Malta	Application should be made to the N.C.S.O. At Alexandria, the N.C.S.O. will make arrangements with the Naval Authorities concerned.
8B	Aden	Application should be made to the N.C.S.O., Aden, giving 24 hours' notice.

B. U. S.—Detailed arrangements for the use of the following direction-finder calibrating facilities shall be made in advance with the Commandant of the Naval District concerned or his local representative.

(1) All stations on this list can furnish service for calibrating D/F on frequencies from about 150 to 1500 kcs. Stations marked with an asterisk can furnish service for calibrating on high frequencies. Additional stations in this list will be equipped for high-frequency service.

B. U. S.—(Continued)

NAMS AREA	Target Location	Target Description
2A	Argentia, NFLD. (HZ) Lat. 47° 17' 55.4" north. Long. 53° 59' 35.3" west.	Base Signal Station tower.
	Narragansett Bay, R. I. (NAFS) Lat. 41° 30' 27.3" north. Long. 71° 19' 51" west.	Signal Tower, Coasters Harbor Island. Adjacent Naval War College. Steel self-supporting tower with observation room at top.
	Deer Island, Mass. (1HZ) Lat. 42° 21' 00" north. Long. 70° 57' 27" west.	Harbor Entrance Control Post. 75-foot signal mast with yardarm and masthead light located on highest point of land.
	Staten Island, N. Y. (HZ) Lat. 40° 36' 18" north. Long. 74° 03' 18" west.	Harbor Entrance Control Post, Fort Wadsworth. Absolute target is a point 20 feet east of signal tower.
	Stratford Shoals, N. Y. (NNFX) Lat. 41° 03' 36" north. Long. 73° 06' 06" west.	Coast Guard lookout tower on top of Middleground Lighthouse.
	Cape May, N. J. (NCR)* Lat. 38° 56' 09" north. Long. 74° 57' 40" west.	Cape May Point Lighthouse.
	Cape Charles City, Va. (NAM4) Lat. 37° 16' 30.02" north. Long. 76° 01' 14.35" west.	A special light, consisting of a cluster of four (4) 1000 Watt lamps with reflectors and covering an arc of approximately 150 degrees bayward (westward) is mounted on the station building at a height of approximately 30 feet.
	Charleston, S. C. (NAO) Lat. 32° 46' 49" north. Long. 79° 55' 30" west.	6-foot square white visual marker on steel pole mounted 35 feet above roof of Fleet Landing Building.
2B	Key West, Fla. (NAR) Lat. 24° 33' 22" north. Long. 81° 48' 25" west.	300-foot steel masts 450 feet apart. Absolute target flying FIVE flag during daylight hours. FIVE flag is flying from the North mast.
	Guantanamo Bay, Cuba (NAW) Lat. 19° 58' 38.1" north. Long. 75° 08' 35" west.	Center flat top antenna between supporting towers.
	Trinidad, B. W. I. (NYB) Lat. 10° 40' 02" north. Long. 61° 37' 48" west.	Red and white wind charger tower near Pt. Gourde Signal tower.
	Coco Solo, C. Z. (NBA1) Lat. 09° 22' 27.1" north. Long. 79° 53' 00.5" west.	Signal tower on elevated water tank, NOB, Coco Solo, C. Z.
	San Juan, P. R. (NAU)* Lat. 18° 28' 03.9" north. Long. 66° 05' 38.8" west.	Center of NAU flat top antenna between supporting towers.

APPENDIX

E

DF CALIBRATION FACILITIES

B U. S.—(Continued)

BAMS AREA	Target Location	Target Description
6A	New Dungeness, Wash. (NNYT) Lat. 48° 10' 55" north. Long. 123° 06' 31" west.	3 80-foot wooden masts, set at the corners of an equilateral triangle. Target is center of triangle.
	Port Angeles, Wash. (NOW) Lat. 48° 08' 03" north. Long. 123° 24' 48" west.	Small red brick building located between a yellow barracks building to the east and a green barracks building to the west.
	Point No Point, Wash. (NNYX) Lat. 47° 54' 07" north. Long. 122° 31' 05" west.	Coast Guard Lighthouse.
	Alki Point, Wash. (NNAV) Lat. 47° 34' 06" north. Long. 122° 25' 02" west.	Coast Guard Lighthouse.
	West Point, Wash. (NNAU) Lat. 47° 38' 02" north. Long. 122° 26' 01" west.	Coast Guard Lighthouse.
6B	San Diego, Calif. (NPL) Lat. 32° 42' 22.000" north. Long. 117° 14' 46.510" west.	Elevated water tank southeasterly portion of Point Loma Radio Station reservation.
	San Clemente, Calif. (NGA) Lat. 33° 00' 09.663" north. Long. 118° 33' 8.223" west.	Transmitter building located on side hill above Wilson Cove. Absolute target 4-foot diamond on top of east wall of transmitter building.
	Terminal Is., Calif. (NWF) Lat. 33° 45' 24.05" north. Long. 118° 14' 01.59" west.	150-foot standard steel radio tower on Roosevelt Base. Absolute target is 12-inch flood light on top of tower facing seaward.
	Hunter's Point, Calif. (NPG1)* Lat. 37° 43' 41" north. Long. 122° 21' 26.3" west.	White mast just to south of Signal Tower on same building, No. 231.
	Honolulu, T. H. (NMO) Lat. 21° 15' 32" north. Long. 157° 48' 44" west.	Coast Guard Lighthouse on Diamond Head, Oahu, T. H.
8	Taboguilla Is., Gulf of Panama (NBA4) Lat. 08° 48' 39" north. Long. 79° 31' 30" west.	Lookout tower atop Taboguilla Island. Absolute target (visible only from seaward side during calibration) is horizontal white panel on left hand side of tower's base.

(2) The following locations are provided with mobile calibrating facilities in small boats and can furnish service from 1500 kc to 20,000 kc.

Casco Bay*	Norfolk	New Orleans
Boston	Bermuda**	Galveston
New York	Charleston	San Juan

* Arrangements to be made with COMINCHLANT.
** Arrangements to be made with COMLANT.

British and U. S. Stations Keeping H/F Watches

TABLE 1

BRITISH STATIONS KEEPING H/F WATCH FOR SHIPS

For full details of stations and times of watch see M. 320 Frequency Guide Supplements and [illegible]

Note: Call signs are radiated by shore stations as shown below. The selection by a ship of the best frequency to use for transmission will be assisted by listening to these transmissions, and by reference to the currently effective M. 320 Frequency Guide Supplements.

Call signs will be made not more than five times except on 16,845 kcs when transmissions will not exceed one minute.

Radio Stations	6,300 kcs (47.62 m.)-8,290 kcs (36.19 m.)	12,685 kcs (23.66 m.)-16,845 kcs (17.81 m.)
United Kingdom	at 00 minutes past each hour	at 00 and 30 minutes past each hour
Mediterranean	at 30, 90 and 105 minutes past each even hour	at 25 and 55 minutes past each hour
West Africa	at 45 minutes past each even hour	at 50 minutes past each hour
South Africa	at 10, 50 and 85 minutes past each even hour	at 20 and 40 minutes past each hour
Canada	at 15 and 75 minutes past each even hour	at 35 and 45 minutes past each hour
East Indies:	Minutes past each even hour	Minutes past each hour
Aden	70	—
Bombay	40	35
Calcutta	55	55
Ceylon	05	04
Kilindini	80	—
Mauritius	30	10

TABLE 2

U. S. STATIONS KEEPING H/F WATCH FOR SHIPS

(a) The following shore stations maintain a listening watch on 4,140, 8,280, 12,420, and 16,560 kcs as indicated in the table:

Line No. (for Reference only)	(Col. 1) Radio Station	(Col. 2) Call Sign	(Col. 3) 4,140 kcs	(Col. 4) 8,280 kcs.	(Col. 5) [illegible] kcs.	(Col. 6) [illegible] kcs.
	Atlantic Stations					
1	Amagansett, N. Y	WSL	Continuous	Continuous	[illegible]	[illegible]
2	Miami, Fla	WAX	Continuous	Continuous	[illegible]	1200-2000
3	New Orleans, La	WNU	Continuous	Continuous	[illegible]	1200-1400
	Pacific Stations					
4	Balboa, C. Z.	NBA	Continuous	Continuous	Continuous	Continuous
5	Guam, Marianas	NPN	Continuous	Continuous	Continuous	Continuous
6	Hillsboro, Oreg.	KEK	Continuous	Continuous	1800-0700	
7	Honolulu, T. H.	NMO	Continuous	Continuous	Continuous	Continuous
8	Manila, P. I.	NPO	1000-2200	Continuous	2200-0600	
9	Palo Alto, Calif	KPS	Continuous	Continuous	1200-1600 [illegible]	[illegible]

APPENDIX

F STATIONS KEEPING H/F WATCHES

(b) Ships shall call on that frequency, consistent with transmission characteristics, which is appropriate for communications between their own position and the shore station called. Pacific stations listed above will use the frequency on which called for answering and working. Atlantic stations will answer and work on frequencies in the applicable high frequency band as follows:

WBL	5555		8390	11115	12585	16850
WAX			8450	11250		16980
WNU		6308		11235		16980

(c) Atlantic stations will indicate working frequencies by the transmission of marker signals consisting of the station call sign and a series of test characters. In like manner, Pacific stations will transmit their calls at frequent intervals on the calling frequencies listed above. This marking will indicate which band would be most satisfactory for making contact and will permit ships to tune their transmitters and receivers for instant use.

TABLE 3

H/F SHIP TO SHORE COMMUNICATION IN THE PACIFIC

(a) Merchant ships in the Pacific, if unable to establish communication on H/F with the appropriate stations listed in currently effective M. 250 Frequency Guide Supplement and Table 2, may pass messages through the Naval Radio shore stations given in the following tables.

(b) The call signs "NQO" (any or all U. S. Naval shore radio stations) and "VHK" (any Australian Radio station) as appropriate, are to be used to establish communication. The station will answer on the calling frequency, using its own call sign.

(c) The following shore stations keep listening watch on 4,235 kcs, 8,470 kcs, 12,705 kcs, and 16,940 kcs as indicated in the table:—

Line No. (for reference only).	(Col. 1.) Radio Station.	(Col. 2.) Call Sign.	(Col. 3.) 4,235 kcs.	(Col. 4.) 8,470 kcs.	(Col. 5.) 12,705 kcs.	(Col. 6.) 16,940 kcs.
1	Auckland (U. S.)	NWX	0600–1800	Continuous	Continuous	1800–0600
2	Guam (U. S.)	NPN	Continuous	Continuous	Continuous	Continuous
3	Honolulu (U. S.)	NPM	Continuous	Continuous	Continuous	Continuous
4	Manila (U. S.)	NPO	Continuous	Continuous	Continuous	Continuous
5	Manus (U. S.)	NTP	Continuous	Continuous	Continuous	Continuous
6	Noumea (U. S.)	NXZ	Continuous	Continuous	Continuous	Continuous
7	San Francisco	NPG	Continuous	Continuous	Continuous	Continuous
8	Wakuya	ZLO	Continuous	Continuous	Continuous	

(d) The following shore stations keep listening watch on 4,740 kcs, 6,360 kcs, 8,990 kcs, 12,685 kcs, and 16,845 kcs as indicated in the table:—

Line No. (for ref. only).	(Col. 1.) Radio Station.	(Col. 2.) Call Sign.	(Col. 3.) 4,740 kcs.	(Col. 4.) 6,360 kcs.	(Col. 5.) 8,990 kcs.	(Col. 6.) 12,685 kcs.	(Col. 7.) 16,845 kcs.
1	Brisbane	VHC	0800–2200	0800–2200	Continuous	Continuous	2200–0800
2	Coonawarra	VHM	1400–2300		Continuous		2300–1400
3	Darwin	VID		1000–2400		2400–1000	
4	Madang	VKM	1400–2100		2100–1400		
5	Perth	VIP	1200–2400	1200–2400	Continuous	2400–1200	2400–1200
6	Thursday Is.	VLM	1000–2200		Continuous		
7	Townsville	VIF	1000–2200		Continuous		

COMBINED PHONETIC ALPHABET

	Alphabet		Numerals
A	Able	0	Zero
B	Baker	1	Wun
C	Charlie	2	Too
D	Dog	3	Thuh-ree
E	Easy	4	Fo-wer
F	Fox	5	Fi-yiv
G	George	6	Six
H	How	7	Seven
I	Item	8	Ate
J	Jig	9	Niner
K	King		
L	Love		
M	Mike		
N	Nan		
O	Oboe		
P	Peter		
Q	Queen		
R	Roger		
S	Sugar		
T	Tare		
U	Uncle		
V	Victor		
W	William		
X	X-ray		
Y	Yoke		
Z	Zebra		

USE OF RADIO STATIONS ON MERCHANT SHIPS IN U. S. PORTS

Instructions governing the use, control, supervision, inspection or closure of radio stations on merchant vessels in U. S. Controlled Ports

A. 1. *Authority:* The instructions herein contained are promulgated pursuant to Title 50, Chapter I, Part 10, Code of U. S. Regulations, (see B following).

2 *Additional definitions:*

(a) As used herein, the term "inland waters" means inland waters subject to the jurisdiction of the United States and includes the Great Lakes.

(b) As used herein, the term "radiating receiver" means any receiving apparatus prohibited by Sec. 8.139 (b) of the Rules and Regulations of the Federal Communications Commission (see D below).

3 *Supervision and security of radio transmitters:*

(a) Radio transmitters (except lifeboat transmitters) aboard any vessel shall be kept within a room or compartment capable of being locked. Only two keys shall be provided, one for the master and one for the radio operator. Normally the radio room will be kept locked in the absence of the operator. When no radio operator is aboard, both keys will be retained by the master or his designated representative. Portable lifeboat transmitters must be stored in the radio room while the vessel is in port.

(b) No person, other than military personnel assigned to communications duties, may enter the radio room except in the presence of the master, his authorized representative or the radio operator, except for the purpose of inspection or service as provided for by paragraph 1 of these instructions.

4 *Permissible transmissions:* All radio transmissions from vessels are prohibited except:

(a) Vessels may make transmissions of distress and enemy sighting messages.

(b) Vessels may make tests in strict accordance with paragraph 6 of these instructions.

(c) Non-commercial vessels and small craft (such as small coastal vessels, tugs and fishing craft) may make such special transmissions as may be authorized by Local Naval Authorities but then only upon direction of the master.

(d) Commercial vessels on arriving from sea or if operating exclusively in inland waters may make transmissions of messages relating to navigation and business of the ship.

(e) Merchant vessels proceeding in convoy or independently as are shall follow "Wartime Instructions for Merchant Ships Vol. 5."

5. *Use of receiving apparatus:*

(a) Radiating receivers shall not be used. Prior to sailing, the master shall ascertain that no such receiver is aboard** in the possession of passengers, officers or crew. If any be found, it shall be placed in the custody of the master pending its removal from the ship.

(b) Nothing contained in paragraph 5 (a) shall prevent the deradiating, on merchant vessels proceeding independently or in convoy, of the radio guards required by "Wartime Instructions for Merchant Ships, Vol. 5" in any instance where such guards would be otherwise impossible.

(c) On vessels proceeding in convoy, the use of receiving apparatus will be governed entirely by the instructions of the Convoy Commodore.

6. *Tests of transmitting apparatus:*

(a) The transmitting apparatus aboard U. S. vessels (except lifeboat transmitters) shall be tested daily while at sea in a manner which will produce an actual emission of signals.

(b) On each occasion of vessels arriving from sea in inland waters intermediate frequency test emissions, using code, emergency and lifeboat transmitters shall be made on 500 kc. In addition, if the ship is equipped with high frequency transmitters, test emissions shall be made on any of the high frequencies authorized for calling.

*The Federal Communications Commission, from time to time publishes lists, by model and manufacturer, of "non-radiating" receivers. Current information is available from the Commission's inspectors. Attention is invited to the fact that the Commission's prohibition is not applicable in certain inland waters.

**Note: This does not require the removal of the ship's receiver where its use is required by paragraph 3 (b) or 5 (c).

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(c) While vessels remain in inland waters test emissions shall be made as often as may be required to insure that the transmitting apparatus is functioning properly. In principle, transmitters should not be tested as a preliminary to getting to sea.

(d) Transmitters may be tested at any time while vessels are in inland waters if an artificial antenna is connected in lieu of any antenna capable of emitting signals.

(e) All of the above tests whether conducted by U. S. vessels or by foreign vessels in waters under the jurisdiction of the U. S. may be conducted only in accordance with "Standard Procedure for Testing Transmitters" (see C following). The duration of any test must be kept to a minimum.

(f) *Any defect* in the radio installation which cannot be or is not permanently repaired by the radio operator shall be reported in writing to the master, the nearest Federal Communications Commission Radio Inspection office, and the appropriate radio operating company immediately the vessel docks.

7. *Inspection and Service:*

(a) *Access* may be had to the radio room for inspection of the equipment by Inspectors of the Federal Communications Commission and for service of the equipment by authorized servicemen, but no such person shall be given unattended access to the equipment unless he displays a special card issued by the Captain of the Port* of the District in which the work is to be performed. Such special card shall set forth complete identifying data as well as the purpose for which it is issued, and shall not be issued by the Captain of the Port until he has submitted the data contained therein to the District Intelligence Officer and received a report thereon.

(b) In case of men to be identified as authorized to perform service on radiotelegraph transmitters, the Captain of the Port shall satisfy himself that the subject person is qualified to copy 16 code groups per minute. Possession of a valid Federal Communications Commission radiotelegraph operator's license (or radiotelephone license endorsed for radiotelegraph operation) or permit other than amateur shall be evidence of such qualification. Where the subject person is considered qualified to perform service on radiotelephone transmitters only, the special card described in subparagraph (a) above shall so state.

8. *Removal of radio apparatus:* The removal of radio apparatus by Naval authority is authorized where retention on board is deemed prejudicial to the national security and defense and the successful conduct of the war. This power of removal should not be arbitrarily exercised but should be exercised only in cases where radio apparatus has been willfully used in violation of the regulations or any instructions issued under them or where there is reasonable cause to believe that it will be so used. Where radio apparatus is removed, it must be stored and safeguarded and the Federal Communications Commission and the owner of the apparatus notified of the action taken. If the owner of the apparatus is innocent of participation in the violation, the apparatus should be surrendered to him on demand.

9. *Enforcement:* The enforcement of these instructions shall be the responsibility of the Commandants of the several naval districts, utilizing Coast Guard personnel if available. Masters of vessels shall be directly responsible to Naval authority for compliance with these instructions aboard their vessels and, to this end, naval authorities shall undertake that the masters are fully apprised of the nature and purport of these instructions and that all necessary explanation is given.

10. *Dissemination:* Addressees shall furnish copies of these instructions to masters of vessels, shipping agencies, radio companies and others concerned and shall disseminate as necessary any authorizations for special transmissions which are issued pursuant to paragraph 4(c).

*Note. Where no U.S. Coast Guard Captain of the Port is present special card shall be issued by the Naval Authority having cognizance of port security matters.

■ Excerpt from Federal Register, Vol. 7, January 10, 1942.

TITLE 34—NAVY

CHAPTER I—DEPARTMENT OF THE NAVY

PART 16—USE, CONTROL, SUPERVISION, INSPECTION OR CLOSURE OF RADIO STATIONS ON ALL VESSELS UNDER THE JURISDICTION OF THE UNITED STATES.

Pursuant to the authority conferred upon the Secretary of the Navy by Order No. 1 of the Defense Communications Board, issued December 24, 1941, under the authority of the Executive Order of December 10, 1941, promulgated under the power vested in the President by section 606 of the Communications Act

USE OF RADIO STATIONS ON MERCHANT SHIPS IN U. S. PORTS

of 1934, as amended, and by virtue of the authority residing in the Secretary of the Navy to ensure the protection of shipping and to promote the successful conduct of the war; I hereby prescribe that from and after this date the use, control, supervision, inspection, or closure of radio stations on all vessels as defined in Title 1, section 3, of the United States Code, domestic and foreign, under the jurisdiction of the United States shall be subject to the following regulations:

§ 16.1. *Prohibition in harbors, ports, etc.:* Radio and signal apparatus (including broadcast receivers), on board all vessels as defined in Title 1, section 3, of the United States Code, domestic and foreign, shall not be used in the harbors, ports, roadsteads, or waters subject to the jurisdiction of the United States, except in accordance with such instructions as may be issued from time to time by naval authority.

§ 16.2. *Prohibition against use by vessels subject to the jurisdiction of the United States, wherever located:* Radio and signal apparatus (including broadcast receivers), on board all vessels as defined in Title 1, section 3, of the United States Code, operating under the laws of the United States and all foreign vessels, owned or operated by citizens of the United States, wherever they may be, shall not be used, except in accordance with such instructions as may be issued from time to time by naval authority. Radio receiving equipment required for the operation of a vessel which complies with the rules of the Federal Communications Commission limiting receiver radiation may, however, be operated under the direction of the master. Foreign vessels which are routed or protected by armed forces of the United States must comply with this regulation.

§ 16.3. *Sealing of radio:* The radio apparatus, of any vessel as defined in Title 1, section 3, of the United States Code, domestic or foreign, may, while in the harbors, ports, roadsteads or waters subject to the jurisdiction of the United States, be sealed by naval authority, and such seals shall not be broken within the jurisdiction of the United States except when authorized by naval authority.

§ 16.4. *Removal of radio apparatus:* The radio and signal apparatus, of any vessel as defined in Title 1, section 3, of the United States Code, operating under the laws of the United States or of any foreign vessel, owned or operated by a citizen of the United States, may be removed by naval authority when retention on board is deemed prejudicial to the national security and defense and the successful conduct of the war.

§ 16.5. *Exceptions, when granted:* Exceptions to any of the provisions of these regulations, may be made by naval authority in cases where it may be found that the use of radio and signal apparatus will not endanger the national security and defense or the successful conduct of the war.

§ 16.6. *Public vessels exempted.* These regulations have no application to vessels operated by the Navy Department or other departments or agencies of the United States Government. The use of radio by such vessels is regulated by instructions issued by proper authority in each such case.

§ 16.7. *Applicability of rules and regulations of Federal Communications Commission:* These regulations and such instructions as may be issued by naval authority under them shall, until amended or revoked, be effective in lieu of any rules or regulations of the Federal Communications Commission inconsistent therewith. Nothing in these regulations or any instructions as may have been issued under them shall be construed as to render ineffective such rules or regulations of the Federal Communications Commission as are not inconsistent therewith.

§ 16.8. *Effective date:* These regulations shall take effect immediately and shall continue in effect until the termination of the present conflict, unless sooner modified or revoked by proper authority.

Issued this 8th day of January 1942.

FRANK KNOX.

[F. R. Doc. 42-[illegible]; Filed, January [illegible], 1942; [illegible] p. m.]

Enclosure (A)

C STANDARD PROCEDURE FOR TESTING TRANSMITTERS

PART I—PROCEDURE GOVERNING THE CONDUCT OF ALL TEST EMISSIONS

A. Radiotelegraph tests

1. Ascertain that there is no traffic in progress on the testing frequency. In addition, when tests are to be made on frequencies between 375 kcs. and 500 kcs., determine that no traffic is in progress on the latter frequency. No tests shall be conducted on 500 kcs. during international silent periods.

2. Transmit the (Morse) character "C" (- . - .)

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3. If a Coastal Station transmits the character "AS" (.– . . .) request testing. When a Coastal Station transmits the character "K" (–.–) or makes no response proceed as below establishing a continuous listening watch on 500 kcs. when testing on intermediate frequencies and on the test frequency when testing on high frequencies.

4. Transmit appropriate call sign (See C below).

5. Transmit a series of "V's" for periods not to exceed 30 seconds, carefully correct not to transmit the four second dashes which actuate auto-alarm devices. In arranging the dash of the "V" do not sustain it longer than 10 seconds.

6. Transmit appropriate call sign (See C below)

7. Enter test in log.

B. *Radiotelephone tests*

1. Ascertain that there is no traffic in progress on the testing frequency.

2. Transmit appropriate call sign (See C below).

3. Repeat the spoken words "test" for periods not exceeding 30 seconds.

4. Transmit the appropriate call sign (See C below).

5. Enter test in log.

C. *Call Signs used for identification purposes*

1. On all vessels, except those navigated exclusively on inland waters, ship radio operators shall begin and conclude all tests with the radiotelephone call sign NUMS (Any United Nations Merchant Ship) followed by an arbitrary selected numeral from 1 to 9 (for example NUMS 8). On vessels navigated occasionally on inland waters ship radio operators shall begin and conclude all tests with the vessel's international call sign.

2. Federal Communications Commission inspectors and radio service personnel shall begin and conclude all tests with a five character signal composed in the following manner:

The first and second characters shall be the initials of the letter's first and last names. The third and fourth characters shall be figures which will represent the Naval District within which tests are being conducted. (Example 1 for First District). The final character being a letter to indicate the name of the radio service company involved. "M" for Mackay Radio, "R" Radiomarine, "T"—Tropical Radio, etc., or, in case of Federal Communications Commission inspectors, the letter "X".

These five character signals shall be registered at the office of the District Commandant who shall forward the Chief of Naval Operations with a complete record thereof together with subsequent changes.

PART II: PROCEDURES GOVERNING THE CONDUCT OF ALL TESTS WHEN NO ACTUAL EMISSION IS PRODUCED.

A. *At once*

1. Disconnect the antenna so as to preclude the possibility of any radiation.

2. Light tube filaments and let them remain lighted for one minute.

3. Start rotating machinery and let it run for two minutes.

4. Operate wave change switches.

5. Make certain that the transmitting key is not depressed at any time during the test.

6. Enter test in log.

7. Reopen connection to ship's antenna

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B. In port

1. Connect the transmitter to the artificial antenna.*

2. Make certain ship or antenna capable of radiation is connected or coupled to the transmitter.

3. Test as the circuit desired, either to establish the functioning of the equipment or to familiarize the operator with it.

4. Enter test in log.

5. Remove connection to ship's antenna

*Note: As specified in Sec. 8.110 (1), Rules and Regulations, Federal Communications Commission, Washington (D)

D

RULES AND REGULATIONS

FEDERAL COMMUNICATIONS COMMISSION

Section 8.110

(a) The use or operation of the following types of receiving equipment is prohibited on board any ship of the United States (other than a ship of less than 1600 gross tons) which departs from, or has departed from, any harbor or port of the continental United States on or after January 15, 1941, for a voyage in the open sea:

(1) Radio receiving equipment which, when used or operated on any frequency in connection with an actual antenna system or its electrical equivalent as to electrical constants to the average receiving antenna(s) used on shipboard, creates an electromagnetic field of more than 0.1 microvolt per meter at a distance over seawater of more than one nautical mile from the receiver.

(2) Radio receiving equipment which, when operated on any frequency, is capable of delivering more than 100 micromicrowatts of power to an antenna having effective [illegible] by the Commission as equivalent to that of the average receiving antenna(s) used on shipboard.

Provided, That this regulation shall not apply to any ship which is navigated solely on the Great Lakes, or on any bays, sounds, rivers, or inland waters within the jurisdiction of the United States, nor to radio receiving equipment which is used solely in connection with a loop antenna, upon the condition that exemplary compliance with the limitation of subparagraph (2) is satisfactorily demonstrated to the Commission.

*An artificial antenna having a capacitance of 200 micromicrofarads and an effective resistance of 4 ohms at a frequency of 550 kilocycles shall be employed for the measurement of the power output of receiving equipment at frequencies between 550 kilocycles and 315 kilocycles. The constants of artificial antennas for tests at other frequencies will be supplied upon request to the Commission.

STATUTORY RULES AND ORDERS FOR BRITISH CONTROLLED SHIPS

STATUTORY RULES AND ORDERS ISSUED BY THE ADMIRALTY AND MINISTRY OF WAR TRANSPORT CONCERNING RADIO APPARATUS AND WATCHKEEPING

Year of Issue	S.R. & O. No.	Issued by	Title.	Subject Matter.
1939	1118	Admiralty	The Wireless Telegraphy (Ships) Order, 1939	Prohibits the use of transmitting apparatus in territorial waters round the U.K.
1940	211	Admiralty	The Wireless Operators and Watches (Merchant Ships) Order, 1940.	Orders the hours of watch to be kept by merchant ships at sea.
1940	[illegible]	Admiralty	The Wireless Operators and Watches (Merchant Ships) Orders, 1940, Amendment Order, 1940.	Orders the carrying of 3 operators if so required by the Admiralty.
1941	1884	Admiralty	The Wireless Telegraphy Receiving Apparatus and Watches (Merchant Ships) Order, 1941.	Limits the degree of radiation permissible from all ships' receivers except broadcast receivers, and gives further orders about W/T watch.
1942	[illegible]	Admiralty	The Wireless Telegraphy Apparatus and Watches (Small Vessels) Order, 1942.	Orders the carrying of at least one Wireless Operator and certain W/T apparatus in all British foreign-going ships of under 1,600 tons.
1942	376	M.O.W.T.	The Merchant Shipping (Wireless Telegraphy) Rules, 1942.	Orders the carrying of D/F apparatus in certain classes of ocean-going merchant ships in which the installation had previously been optional.
1942	[illegible]	Admiralty	The Wireless Telegraphy (Ships) No. 2 Order, 1942	Provides for the safe custody of all wireless transmitting apparatus and orders the lowering of wireless aerials on all merchant ships while in U.K. ports.
1942	1519	M.O.W.T.	The Merchant Shipping (Life-Saving Appliances) Emergency Rules, 1942.	Orders the carrying of portable transmitting and receiving apparatus in certain classes of ships.
1942	2202	Admiralty	The Wireless Telegraphy Emergency Apparatus (Merchant Ships) Order, 1942.	Orders the carrying of an additional Emergency Wireless Apparatus in a compartment remote from the main W/T office in all ocean-going British merchant ships.
1945	265	Admiralty	The Wireless Receivers (Ships) Order, 1945.	Restricts the possession and use of broadcast receivers on ocean-going merchant ships and limits the degree of radiation permissible on such receivers.

APPENDIX

1 STATUTORY RULES AND ORDERS FOR BRITISH CONTROLLED SHIPS

STATUTORY RULES AND ORDERS

1939 No. 1158

THE WIRELESS TELEGRAPHY (SHIPS) ORDER, 1939.

In pursuance of the powers conferred on them by Regulation 8 of the Defence Regulations, 1939, the Lords Commissioners of the Admiralty hereby make the following Order:—

1. All persons on board any [illegible] ship, or in any vessel in any tidal water of Great Britain and Northern Ireland (including tidal waters in any harbour, river or inland waterway), are forbidden to use any wireless transmitting apparatus.

2. All persons on board any merchant vessel within the territorial waters of Great Britain and Northern Ireland, other than the waters covered by clause 1, and all persons on board any British merchant vessel (except a Dominion vessel) on the high seas or wherever they may be (except as provided in clause 1), are to conform to the directions issued by or on behalf of the Admiralty regarding the use of wireless transmitting apparatus.

3. This Order shall come into force forthwith and may be cited as the Wireless Telegraphy (Ships) Order, 1939.

By Command of Their Lordships.

R. H. A. Carter.

Admiralty, S.W.1.

29th August, 1939.

STATUTORY RULES AND ORDERS

1940 No. 331

THE WIRELESS OPERATORS AND WATCHES (MERCHANT SHIPS) ORDER, 1940.

In pursuance of Regulation 45 of the Defence Regulations, 1939, the Lords Commissioners of the Admiralty hereby make the following Order:—

1. Every British ship to which the Merchant Shipping (Wireless Telegraphy) Rules, 1938, apply, whose [illegible], not being a ship of war or a Dominion ship, shall be provided with not less than two operators if so required by the Admiralty or a person authorised by the Admiralty.

2. Every British ship to which the Merchant Shipping (Wireless Telegraphy) Rules, 1938, apply, not being a ship of war or a Dominion ship, shall, when at sea, maintain such wireless watches as may be ordered by the Admiralty or a person authorised by the Admiralty, and in the absence of other instructions from such authority shall, when at sea, maintain wireless watches as follows:—

(a) When three or more operators are carried, a continuous watch.

(b) When two operators are carried, [illegible] watch, and (ii) if the hours of [illegible], for not less than [illegible] hours a day, including the hours specified in the last column of the Schedule to this Order.

(c) When one operator only is available, then for not less than eight hours a day, including the hours specified in the [illegible] column of the Schedule to this Order, provided that, if the [illegible], wireless watch shall be kept during the whole time that the ship is at sea.

3. Wireless watches in accordance with this Order shall be maintained by an operator, [illegible] that the ship [illegible].

4. For the purpose of this Order the persons authorised by the Admiralty include the Senior Naval Officer of any port, the Officer in charge of any Convoy, any Officer appointed for Naval Control Service Duties and any Officer appointed by any of the aforesaid Officers or by the Admiralty to act in these matters.

5. The Wireless Operators and Watches (Merchant Ships) Order, 1939, is hereby [illegible].

6. This Order shall come into force forthwith and may be cited as the Wireless Operators and Watches (Merchant Ships) Order, 1940.

By Command of their Lordships.

R. H. A. Carter.

Admiralty, S.W.1.

7th March, 1940.

STATUTORY RULES AND ORDERS

1940 No. 1831

THE WIRELESS OPERATORS AND WATCHES (MERCHANT SHIPS) ORDER, 1940, AMENDMENT ORDER, 1940.

In pursuance of Regulation 45 of the Defence (General) Regulations, 1939, the Lords Commissioners of the Admiralty hereby make the following Order:—

1. Paragraph 1 of the Wireless Operators and Watches (Merchant Ships Order, 1940(*), shall be amended and take effect as follows:—

"1. Every British ship to which the Merchant Shipping (Wireless Telegraphy) Rules, 1938, apply, whose hours at sea exceed eight, not being a ship of war or a Dominion ship, shall be provided with not less than three operators if so required by the Admiralty or a person authorised by the Admiralty."

2. This Order shall come into force forthwith and may be cited as the Wireless Operators and Watches (Merchant Ships) Order, 1940, Amendment Order, 1940.

By Command of Their Lordships,
R. H. A. Carter.

Admiralty, S.W.1.
3rd October, 1940.

*S.R. & O. 1940 No. 331.

APPENDIX

I

STATUTORY RULES AND ORDERS FOR BRITISH CONTROLLED SHIPS

STATUTORY RULES AND ORDERS

1941 No. 1281

THE WIRELESS TELEGRAPHY RECEIVING APPARATUS AND WATCHES (MERCHANT SHIPS) ORDER, 1941.

In pursuance of Regulation 41 of the Defence (General) Regulations, 1939, the Lords Commissioners of the Admiralty hereby make the following Order:—

1. This Order shall apply to every British ship to which the Merchant Shipping (Wireless Telegraphy) Rules, 1938 apply, not being a ship of war, or a Dominion ship.

2. Every ship to which the provisions of this Order apply shall, in addition to the main aerial forming part of the installation required under the Merchant Shipping (Wireless Telegraphy) Rules, 1938, be fitted with an auxiliary aerial for emergency use which shall be carried in a different place from the main aerial. Where the ship is fitted, both main and auxiliary aerials shall, at all times, be capable of immediate connection with the main wireless transmitting set by means of a switch or like. A spare length of aerial wire shall also be carried on board for use in the event of the main and emergency aerials being destroyed or otherwise rendered useless.

3. Every ship to which the provisions of this Order apply, and which is required under the Wireless Operators and Watches (Merchant Ships) Order, 1941, or the Wireless Operators and Watches (Merchant Ships) Order, 1940, Amendment Order, 1941,† to carry two or more operators, shall be provided with wireless telegraphy receiving apparatus as follows, including any such apparatus carried in compliance with any Statute or Statutory regulations:—

(i) A wireless receiver capable of receiving waves of types A1, A2 and B on frequencies from 6,000 kilocycles per second to 25,000 kilocycles per second. Provided that until such apparatus is readily available, ships shall be deemed to comply with these requirements if the receiver is capable of receiving on frequencies from 6,000 to 20,000 kc/s.

(ii) A wireless receiver capable of receiving waves of types A1, A2 and B on frequencies from 15 kc/s to 1,000 kc/s.

(iii) Alternatively to the receivers mentioned in the foregoing sub-paragraphs (i) and (ii) hereof, a single receiver capable of receiving waves of types A1, A2 and B on all frequencies from the higher frequency stipulated in sub-paragraph (i) hereof to the lower frequency stipulated in sub-paragraph (ii) hereof.

(iv) A receiver capable of receiving waves on frequencies from 488 to 512 kilocycles per second. This receiver shall be separate from the receivers required by sub-paragraphs (i) and (ii) or by the sub-paragraph (iii) hereof.

(v) Sufficient batteries to operate the receivers and to provide for the recharging of the batteries while maintaining continuous reception on one receiver.

(vi) In addition to the wireless receiving apparatus required to be provided by sub-paragraphs (i) and (iv) hereof, ships to which the provisions of this Order apply may be fitted with, or carry the following wireless receiving apparatus:—

(a) One set of direction finding purposes apparatus.

(b) One set of auto alarm apparatus.

(c) One set of radio telephony equipment.

(d) One set for use in emergency.

(e) Sets fitted in lifeboats or specially provided for use in lifeboats.

4.—(i) All wireless receivers fitted after the date of this Order in British ships to which the provisions of this Order apply shall be such that the radiation from them shall not exceed 0.1 microwatts per metre on any of the frequencies for which they are capable of being used measured as a distance of 1 nautical mile when attached to an approved aerial.

(ii) Any existing receivers to which the provisions of this Order apply and which do not comply with the requirements as to radiation laid down in sub-paragraph (i) hereof shall either be brought into compliance therewith or be replaced at the earliest opportunity.

5.—(i) Every British ship which carries three Radio Officers shall, in addition to keeping continuous watch as required under the Wireless Operators and Watches (Merchant Ships) Order, 1940,* or a frequency of 500 kilocycles per second (or long a second and independent watch on such frequencies and at such times as may be notified from time to time by the Admiralty or a duly authorised officer on their behalf.

(ii) On every British ship which carries only two Radio Officers a continuous watch shall be kept unless an officer duly authorised on behalf of the Admiralty shall approve otherwise. This continuous watch shall be on a frequency of 500 kilocycles per second. In addition, a second and independent watch shall be kept on such frequency and at such times as may from time to time be notified by the Admiralty or a duly authorised officer on their behalf.

6. Wireless watches in accordance with this Order shall be maintained by a Radio Officer notwithstanding that the ship may be provided with an auto-alarm or similar device except that ships with only two Radio Officers shall, on the 500 kilocycles per second frequency, employ an auto-alarm or other receiver operating a loud speaker during those periods when the Radio Officer on duty is also required to keep a watch on another frequency, as prescribed in paragraph 5, sub-paragraph (ii). Any such loud speaker shall be situated close to the Radio Officer on duty.

7. The Admiralty or an Officer duly authorised on their behalf, may exempt, subject to such conditions as may be imposed, any ship for the period of any voyage or voyages, from compliance with any of the requirements of this Order.

8. For the purpose of this Order, the Officers authorised by the Admiralty include the Flag or Naval Officer-in-Charge of any port, the Officer-in-Charge of any Convoy, any Officer appointed for Naval Control Service duties and any Officer appointed by any of the aforesaid officers or by the Admiralty to act in these matters.

9. This Order shall come into force forthwith and may be cited as the Wireless Telegraphy Apparatus and Watches (Merchant Ships) Order, 1941.

By Command of their Lordships,
H. V. Markham.

Admiralty, S.W.1.

28th July, 1941.

* S.R. & O. 1940, No. 331.
† S.R. & O. 1940, No. 1811.

STATUTORY RULES AND ORDERS

1942 No. 333

THE WIRELESS TELEGRAPHY APPARATUS AND WATCHES (SMALL VESSELS) ORDER, 1942.

In pursuance of Regulation 43 of the Defence (General) Regulations, 1939, The Lords Commissioners of the Admiralty hereby make the following Order:—

1. This Order shall apply to every British foreign going ship under 1,600 gross registered tons not being a passenger ship, ship of war, or Dominion ship.

2. The expression "foreign going ship" in this Order shall have the same meaning as the expression "foreign going ship" in the Merchant Shipping Act, 1894.

3. No ship to which the provisions of this Order apply shall, except under permission granted by or on behalf of the Admiralty, proceed to sea from any port (whether within or outside the U.K.) unless she is equipped with a wireless telegraph installation (hereinafter referred to as the "installation") of a type approved by the Postmaster-General and which complies with the provisions of paragraphs 4, 5, 6 and 7 hereof.

4. (i) All dangerous parts of the installation shall be either screened or effectively isolated.

(ii) Suitable arrangements are to be made to the satisfaction of the Minister of War Transport for housing the installation which shall secure that there will be no interference by extraneous noises or otherwise with the efficient reception of wireless signals. The housing shall include provision for efficient means of communication with the bridge of the ship and the equipment shall include all necessary tools and spares, together with a spare aerial for emergency use. Where the installation is fitted in a separate compartment the equipment shall include an emergency lighting installation unless other arrangements for such lighting have been made.

5. The installation shall be so constructed as to be capable of transmitting on waves of type A2 or B on a frequency of 500 kilocycles per second and of receiving clearly on all frequencies from 1,000 kilocycles per second to 1½ kilocycles per second and of allowing changes from transmission to reception and vice versa when communication is established to be made rapidly.

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6. (i) Sufficient power shall be provided by means of batteries for the working of the installation and means shall be provided for charging the batteries.

(ii) Batteries shall be maintained in a fully charged condition. A statement that this requirement has been fulfilled shall be inserted in the official log book each day.

(iii) A record of batteries shall be kept by the operator in the form shown in the *Fifth Schedule* to the Merchant Shipping (Wireless Telegraphy) Rules, 1938. These records shall be open to the inspection of any officer authorised for that purpose by the Minister of War Transport or the Postmaster-General.

7. The normal range of the transmitter shall not be less than 75 nautical miles by day, which will be considered as equivalent to 25 metre amperes.

8. Every ship to which the provisions of this Order apply shall carry at least one Wireless operator who shall possess the Postmaster General's Special Certificate of Proficiency in Radio Telegraphy or a certificate of a higher grade and who shall have had at least six months' experience as Wireless operator at sea.

9. Wireless watches shall be maintained on board for not less than eight hours a day including the times specified in the penultimate column of the schedule to the Wireless Operators and Watches (Merchant Ships) Order 1940,* or for such other period or periods as may be required by the Admiralty.

10. A Wireless log shall be carried on board and kept as near as possible to the installation. It shall be available for inspection by any Officer authorised for that purpose by the Minister of War Transport or the Postmaster-General. Every operator shall enter in the wireless log his name, the times at which he goes on and off watch, and all incidents occurring during his watch connected with the wireless telegraphy service which may appear to be of importance to the safety of life at sea. In particular there shall be entered in the wireless log where practicable all distress messages and distress traffic in full.

11. The Master of every ship to which the provisions of this Order apply shall take all necessary steps to ensure that the wireless telegraphy service of the ship is maintained in accordance with the provisions of this Order (and with the conditions of the licence granted by the Postmaster-General under the Wireless Telegraphy Acts 1904 to 1926).

12. All wireless telegraphy receiving apparatus on board shall comply with the Wireless Receivers (Ships) (No. 2) Order, 1941,† and as regards radiation shall comply with the Wireless Telegraphy Receiving Apparatus and Watches (Merchant Ships) Order, 1941.‡

By Command of their Lordships,
H. V. Markham.

Admiralty, S.W.1.
7th February, 1942.

* S.R. & O. 1940 No. 331.
† S.R. & O. 1941 No. 1385
‡ S.R. & O. 1941 No. 1281.

393/2738

STATUTORY RULES AND ORDERS

1942 No. [illegible]

THE MERCHANT SHIPPING (WIRELESS TELEGRAPHY) RULES, 1942.

The Minister of War Transport (hereinafter referred to as "the Minister") in exercise of the powers conferred upon the Board of Trade by the Merchant Shipping (Wireless Telegraphy) Act, 1919 (9 & 10 Geo. 5, c. 38), and the Merchant Shipping (Safety and Load Line Conventions) Act, 1932 (22 & 23 Geo. 5, c. 9), and now vested in him by virtue of the Minister of Shipping (Transfer of Functions) Order, 1939, and the Ministers of the Crown (Minister of War Transport) Order, 1941, and of all other powers enabling him in that behalf and after consultation with the Postmaster General hereby makes the following Rules:—

1. (i) These Rules are supplemental to the Merchant Shipping (Wireless Telegraphy) Rules, 1938 (hereinafter referred to as "the principal Rules").

(ii) These Rules may be cited as the Merchant Shipping (Wireless Telegraphy) Rules, 1942, and shall come into force on the 2nd day of March, 1942.

(iii) In these Rules "approved" means approved by the Minister and the Postmaster-General.

(iv) The Interpretation Act, 1889 (52 & 53 Vict., c. 63), shall apply to the interpretation of these Rules as it applies to the interpretation of an Act of Parliament.

STATUTORY RULES AND ORDERS FOR BRITISH CONTROLLED SHIPS

2. These Rules shall apply to ships in respect of which a certificate issued by the competent authority under Regulation 47BBB of the Defence (General) Regulations, 1939, is in force.

3. Ships to which these Rules apply shall, for the purposes of the principal Rules, be deemed not to be passenger ships, and the principal Rules shall apply to such ships as they apply to cargo ships.

4. Notwithstanding the foregoing provisions of these Rules, every ship of 5,000 tons gross tonnage and upwards to which these Rules apply shall be provided with a direction finding apparatus (in the principal Rules referred to as "the direction finder") of an approved type, and such of the principal Rules as relate to the direction finder shall apply accordingly.

5. The Minister or any Surveyor of ships or other person duly authorised in that behalf by the Minister may exempt, subject to such conditions as he thinks fit to impose, any ship, for the period of any voyage or voyages, from compliance with any requirements of these Rules, if he is satisfied that the requirement is either impracticable or unreasonable having regard to all the circumstances of the case.

Signed by authority of the Minister of War Transport this 2nd day of March, 1942.

E. J. Foley,
A Deputy Director General of the Ministry of War Transport.

STATUTORY RULES AND ORDERS

1942 No. 688

THE WIRELESS TELEGRAPHY (SHIPS) NO. 2 ORDER, 1942.

Revoked 27 Dec 45 by AFO 250 6/45 Revocation order AO 2/1946

In pursuance of the powers conferred on them by Regulation 8 of the Defence (General) Regulations, 1939, the Lords Commissioners of the Admiralty hereby make the following Order:—

1. All wireless transmitting apparatus on board any ship or vessel (not being a ship of war) within the territorial waters of the United Kingdom of Great Britain and Northern Ireland, shall be contained in a compartment or receptacle capable of being locked.

2. Such compartment or receptacle shall be kept locked while such ship or vessel is within any port in Great Britain or Northern Ireland (including any harbour, river or inland waterway) except when under way or when specially authorised to be opened as hereinafter provided.

3. The key of the said compartment or receptacle shall be retained in the personal custody of the Senior Deck Officer on board such ship or vessel (the expression "Senior Deck Officer" shall mean the officer in executive charge of the ship or vessel for the time being).

4. The Senior Deck Officer is authorised to unlock the said compartment or receptacle to enable the apparatus to be inspected or tested by a person duly authorised in that behalf by the Admiralty, by the Minister of War Transport, or by the Postmaster-General, or for any other lawful purpose.

5. All wireless aerials installed in any ship or vessel to which the provisions of this Order apply shall (except when such ship is underway or testing or will stay in port for a period of less than 24 hours duration) be lowered and disconnected whilst such ships or vessels are in port as aforesaid, provided always that the following receiving aerials may be used to enable the crew to listen to wireless broadcast programmes whilst such ships are in port, namely one aerial not exceeding 40 feet in length for each receiver fitted in the ship or vessel in accordance with the requirements of the Wireless Receivers (Ships) No. 2 Order, 1941.*

6. This Order shall come into force forthwith and may be cited as the Wireless Telegraphy (Ships) No. 2 Order, 1942.

By Command of their Lordships,
H. V. Markham.

Admiralty, S.W.1.
9th April, 1942.

*S.R. & O. 1941 No. 1285.

APPENDIX

I STATUTORY RULES AND ORDERS FOR BRITISH CONTROLLED SHIPS

STATUTORY RULES AND ORDERS

1942 No. 1228

THE MERCHANT SHIPPING (LIFE-SAVING APPLIANCES) EMERGENCY RULES, 1942

The Minister of War Transport (hereinafter referred to as "the Minister") in exercise of the powers conferred upon the Board of Trade by section 427 of the Merchant Shipping Act, 1894 (57 & 58 Vict. c. 60), and now vested in him by virtue of the Minister of Shipping (Transfer of Functions) Order, 1939, and the Ministers of the Crown (Minister of War Transport) Order, 1941, and of all other powers enabling him in that behalf hereby makes the following Rules:—

1. (1) These Rules are supplemental to the Merchant Shipping (Life-Saving Appliances) Rules, 1930 (hereinafter referred to as "the principal Rules").

(2) These Rules may be cited as the Merchant Shipping (Life-Saving Appliances) Emergency Rules, 1942, and shall come into operation on the tenth day of August, 1942.

(3) In these Rules unless the context otherwise requires—

"Approved" means approved by the Minister.

.....

30. (1) Every ship of Classes I, II, XI and XVIII shall be provided with—

(a) two approved aerial masts, of which, one shall be kept in a lifeboat on the port side and the other in a lifeboat on the starboard side of the ship, together with a length of aerial wire to be kept with the apparatus mentioned in paragraph (1) (b) of this Rule;

(b) an approved portable wireless transmitting apparatus and an approved portable wireless receiving apparatus, both of which shall be kept together in the chart room or other approved room ready to be placed in one or other of the lifeboats mentioned in paragraph (1) (a) of this Rule for immediate use in the event of an emergency;

(c) approved means, which shall be kept in the same room as the transmitting and receiving apparatus, of charging the batteries of the apparatus.

The above requirements of this Rule shall not apply to ships which, in pursuance of the principal Rules, carry two radio lifeboats fitted with an approved wireless installation.

(2) All batteries supplied with the apparatus shall be fully charged once a fortnight. The Master shall cause a record of all such chargings to be kept by the Chief Radio Officer.....

34. The Minister or any Surveyor of Ships or other person duly authorised in that behalf by the Minister may exempt, subject to such conditions as he thinks fit to impose, any ship, for the period of any voyage or voyages, from compliance with any requirements of these Rules, if he is satisfied that the requirement is either impracticable or unreasonable having regard to all the circumstances of the case.

Signed by authority of the Minister of War Transport this twenty-seventh day of July, 1942.

E. J. Foley,
A Deputy Director-General of the
Ministry of War Transport.

STATUTORY RULES AND ORDERS

1942 No. 1091

THE WIRELESS TELEGRAPHY EMERGENCY APPARATUS (MERCHANT SHIPS) ORDER, 1942.

In pursuance of Regulation 45 of the Defence (General) Regulations, 1939, the Lords Commissioners of the Admiralty hereby make the following Order:—

1. This Order shall apply to every British ship to which the Merchant Shipping (Wireless Telegraphy) Rules, 1938, apply, not being a ship of war or a Dominion ship.

APPENDIX

STATUTORY RULES AND ORDERS FOR BRITISH CONTROLLED SHIPS

I

2. Notwithstanding anything which may be laid down in the Wireless Telegraphy Receiving Apparatus and Watches (Merchant Ships) Order, 1941 *, and the Wireless Receivers (Ships) (No. 2) Order, 1941 †, no ship to which this Order applies shall, except under permission granted by or on behalf of the Admiralty, proceed to sea from any port (whether within or outside the United Kingdom) unless it is fitted with an additional Emergency Wireless Apparatus as follows:—

(a) In a compartment remote from the main wireless office there shall be fitted a battery operated emergency transmitting and receiving apparatus capable of operating on 500 kc/s.

(b) Arrangements shall be provided in the compartment mentioned in paragraph 2 (a) hereof—

(i) For charging the batteries used to supply the emergency transmitter and receiver fitted in the compartment.

(ii) For the electric lighting of the compartment in emergency.

(c) The apparatus referred to in sub-paragraph (b) above shall be connected to an aerial separate from those to which the main wireless set can be connected.

(d) The foregoing apparatus shall be of a type and pattern approved by H.M. Postmaster General.

3. This Order shall come into force forthwith and may be cited as the "Wireless Telegraphy Emergency Apparatus (Merchant Ships) Order, 1942."

By Command of their Lordships.
H. V. Markham.

Admiralty, S.W.1.
14th October, 1942.

S.R. & O. 1941 No. 1384.
S.R. & O. 1941 No. 1385.

STATUTORY RULES AND ORDERS

1941 No. 865

WIRELESS TELEGRAPHY (SHIPS) ORDER, 1941

In pursuance of powers conferred on them by Regulation 45 of the Defence (General) Regulations, 1939, the Lords Commissioners of the Admiralty hereby make the following Order:—

1. (1) This Order shall apply to every British foreign going ship being a ship to which the Merchant Shipping (Wireless Telegraphy) Rules, 1938, or the Wireless Telegraphy (Apparatus and Watches) (Small Vessels) Order, 1942*, apply and not being a ship of war or a Dominion ship.

(2) The expression "Receiver" in this Order means an apparatus for receiving wireless broadcast transmissions other than that required or permitted to be carried by the Merchant Shipping (Wireless Telegraphy) Rules, 1938, and the Wireless Telegraphy (Receiving Apparatus and Watches) (Merchant Ships) Order, 1941†.

(3) No person shall, on board any vessel to which the provisions of this Order apply, have in his possession or use a receiver except under permission granted by or on behalf of the Admiralty:—

Provided that this paragraph shall not apply—

(a) while the vessel is in port; or

(b) so as to prevent the Master having in his possession any receiver entrusted to him for safe custody before the vessel proceeds to sea (or found on board the vessel in contravention of this Order while at sea); or

(c) to receivers carried as cargo properly consigned and stowed; or

(d) to a receiver lawfully fitted under the next following paragraph.

(4) No vessel to which the provisions of this Order apply shall, except under permission granted by or on behalf of the Admiralty, be fitted with more than one receiver which shall be of a type approved by the Admiralty with extension loud-speakers as required for the use of the Master, Officers, passengers and crew.

(5) Any receiver installed under paragraph (4) hereof shall be fitted in a position approved by an officer duly authorised on behalf of the Admiralty or the Minister of War Transport and shall be secured in such manner that it cannot be removed by an unauthorised person.

(6) All switches controlling the electrical supply to any such receiver shall be capable of being locked.

(7) The radiation from any such receiver when attached to an aerial suitable for receiving any of the frequencies for which it is capable of being used shall not exceed 0.1 micro-volts per metre when measured at a distance of one nautical mile.

(8) No aerial shall be used in connection with any such receiver:—

(a) within a radius of 50 feet of the aerials of a direction finder; or

(b) if it is liable to set up electrical interference with any other of the ship's wireless installations; provided that this sub-paragraph shall not apply to any aerial fitted in a permanent manner and which has been approved by an officer duly authorised by the Admiralty or the Minister of War Transport.

(9) The keys of the switches referred to in paragraph (6) hereof shall be retained in the custody of or under the direct control of the Master.

(10) For the purpose of this Order officers authorised by the Admiralty include the Flag or Naval Officer-in-Charge of any port, the Officer-in-Charge of any convoy and any officer appointed by any of the aforesaid officers.

(11) Nothing in this Order shall authorise the use of any receiver in respect of which a licence is required by the Wireless Telegraphy Act, 1904, or the Wireless Telegraphy Order, 1908, or any other enactment, without such licence having been obtained.

(12) The Wireless Receivers (Ships) Order No. 2, 1941‡ is hereby cancelled.

2. This Order shall come into force on the 1st day of April, 1945, and may be cited as the Wireless Receivers (Ships) Order, 1945.

By Command of their Lordships,
H. V. Markham.

Admiralty, S.W.1.
8th March, 1945.

*S.R. & O. 1942 No. 223.
†S.R. & O. 1941 No. 1284.
‡S.R. & O. 1941 No. 1285.

Definition of Non-Combat Areas

SECTION 1

(a) On 29 May 1945, the Navy Department and the Admiralty designated certain areas of the world as "Non-Combat Areas". Merchant ships of the United Nations are to continue to follow instructions in WIMS, but such instructions may be modified from time to time by special instructions for merchant vessels operating in the Non-Combat Areas. These special instructions may be promulgated through BAMS messages, and will be included in this Appendix and in a similar Appendix to WIMS 1.

(b) The following are designated as Non-Combat Areas:

(1) North Atlantic Ocean including Caribbean Sea and Gulf of Mexico.
(2) South Atlantic Ocean east of 74° West to longitude of Capetown.
(3) Mediterranean.
(4) Baltic and North Seas.
(5) Arctic Ocean.
(6) Black and Red Seas.
(7) North and South Pacific Oceans east of 82° West.

All other waters are Combat Areas. The ports of Capetown, Aden and Balboa are considered as being in the Combat Areas.

BAMS War Zone and Non-Combat Message Series

SECTION 2

(a) General messages intended for all merchant ships in the Non-Combat Areas are divided into two series:

(1) British BAMS Non-Combat Area Lettered Messages. These are originated by the Admiralty and are allocated prefix letters NC followed by an additional letter or letters in strict alphabetical sequence, e.g., NCA, NCB, etc.

(2) U.S. BAMS Non-Combat Area Numbered Messages. These are originated by the U. S. Navy Department and are allocated prefix letters NC followed by numerals in strict numeral sequence beginning with one, e.g., NC1, NC2, etc.

(b) General messages intended for all merchant ships in Combat Areas are divided into two series:

(1) British BAMS War Zone Lettered Messages. These are originated by the Admiralty and are allocated prefix letters WZ followed by an additional letter or letters in strict alphabetical sequence, e.g., WZA, WZB, etc.

(2) U. S. BAMS War Zone Numbered Messages. These are originated by the U. S. Navy Department and are allocated prefix letters WZ followed by numerals in strict numerical sequence beginning with one, e.g., WZ1, WZ2, etc.

(c) Merchant ships are to read and hold the worldwide Numbered and Lettered series (see Article 67), plus the appropriate U. S. and British Non-Combat Area and War Zone series for areas in which they are operating.

(d) U. S. and British Routing Authorities at Port Said, Aden, Balboa, Capetown and Punta Arenas hold all series and will bring ships' sets up to date when proceeding from Combat–Non-Combat Areas, or vice versa.

SECTION 3 Radio communications

(a) While ships are in Non-Combat Areas, ship-to-shore and shore-to-ship radio communications are permitted under the following conditions:

(1) All ship-to-shore or shore-to-ship radio communications shall be routed through Naval operated or controlled channels *except as noted in Section 9 below*. All coastal stations listed in Appendix A, and also all U. S. commercial coastal and marine relay stations, are considered to be Naval controlled.

(2) Messages may be sent in plain language, using International Call Signs, except that no plain language messages may be sent which will disclose information to the enemy concerning impending movements into Combat Areas. For this purpose, Aden, Capetown and Balboa shall be considered as coming within the Combat Area.

(3) No private messages, i.e., messages other than those concerning ships' business, are permitted.

(4) Coastal radio stations will revert to the direct method of communicating with merchant ships (see Article 10).

(5) No direct inter-ship messages are allowed except in an emergency.

(6) Enciphered messages shall employ General Call Signs (see Article 55).

(7) Ships shall transmit messages addressed to Naval Authorities only through coastal stations listed in Appendix A or in effective British BAMS Lettered Messages and U. S. BAMS Numbered Messages of all series.

Radio Watchkeeping

SECTION 4

(a) Ships shall continue to guard BAMS schedules from Zone and Area Stations.

(b) Special single and two-operator watchkeeping periods (see Appendix B) will remain in force for all ships except those operating exclusively in United Kingdom or continental European coastal trade; the latter shall revert to International Watchkeeping Periods.

(c) *British*-managed ships in Non-Combat Areas may keep a loudspeaker watch instead of a second and independent watch (see Article 120d).

Message Charges

SECTION 5

(a) All radio messages except those described in (d) below and those intended for or originated by Naval Authorities will be charged at normal commercial rates.

(b) Ship and coastal station charges will be those appropriate to the country concerned.

(c) Onward transmission charges from a coastal station may be ascertained from that station (British Naval H/F stations will not be able to give any information concerning telegraphic charges).

(d) Messages not permitted in plain language (i.e., those messages which disclose to the enemy information of impending movements in the Combat Areas) shall be sent in the appropriate code recoded by the General Recoding Table in force and addressed to a Naval Authority. No charge will be made for these messages.

APPENDIX

J NON-COMBAT AREAS

SECTION 6

Non-approved Receivers

(a) *U. S.-managed* ships and ships of Canadian registry operating in Non-Combat Areas may use non-approved broadcast receivers. Ten hours prior to entering Combat Areas, Masters shall have all non-approved radio broadcast receivers collected and stowed until the vessel again enters Non-Combat Areas.

(1) No antennae shall be erected in a position where they may cause interference with any of the ships other installations.

SECTION 7

Diversion Messages

(a) Merchant ships coming within range of Gibraltar may expect to receive diversion messages either by V/S or by radio on 500 kcs.

SECTION 8

ETA Reports

(a) Ships sailing in Non-Combat Areas shall always send required ETA reports *in plain language* unless given specific instructions to do otherwise (see Article 135).

SECTION 9

Additional Coastal Stations

(a) Official U. S. War Department traffic only, to and from U. S. Army transports bound for certain U. S. ports, may be handled through the following U. S. Army Coastal radio stations. No traffic is to be transmitted while BAMS zone and area broadcasts are in progress.

(1) *New York WVP* Medium frequencies—calls on 500 kcs and shifts to working frequency of 428 kcs. High frequencies—calls and receives at times indicated on following high frequencies:

1200Z–2200Z	8510 or 12765 kcs
2200Z–0000Z	4255 or 8510 kcs
0000Z–1200Z	8510 kcs

(b) Commercial traffic concerning ship's business, such as ETA reports to agents and operators, may be handled through the following radio stations which are *not* Naval-controlled (see Section 3 (a) (1) above). Consult Berne List for working frequencies and times of watch.

(1) *Netherlands West Indies*

Aruba – PJA
Curacao - PJC

(2) *Venezuela*

Maiquetia – YVG
Maricaibo – YVJ
Puerto Cabello – YVL

APPENDIX

K

APPENDIX K was assigned at personal [illegible]

CONVERSION TABLE
KILOCYCLES PER SECOND—WAVELENGTH

Kilocycles (per second.)	Wavelength (in meters.)	Kilocycles (per second.)	Wavelength (in meters.)	Kilocycles (per second.)	Wavelength (in meters.)
300,000	1	3,750	80	222.2	1,350
150,000	2	3,529	85	214.3	1,400
100,000	3	3,333	90	211.8	1,410
75,000	4	3,158	95	206.9	1,450
60,000	5	3,000	100	201.7	1,480
50,000	6	2,857	105	200.0	1,500
42,855	7	2,727	110	193.5	1,550
37,500	8	2,609	115	187.5	1,600
33,333	9	2,500	120	181.8	1,650
30,000	10	2,410	124.5	176.5	1,700
27,273	11	2,308	130	175.4	1,740
25,000	12	2,143	140	171.4	1,750
23,077	13	2,000	150	166.7	1,800
21,429	14	1,875	160	162.2	1,850
20,000	15	1,765	170	157.9	1,900
19,048	15.37	1,667	180	153.8	1,950
18,480	15.40	1,579	190	151.5	1,980
18,750	16	1,500	200	150.0	2,000
17,647	17	1,429	210	149.0	2,013
17,110	17.53	1,364	220	142.9	2,100
16,941	17.81	1,304	230	138.25	2,170
16,666	18	1,250	240	136.4	2,200
15,789	19	1,200	250	133.3	2,250
15,000	20	1,154	260	130.4	2,300
14,630	20.51	1,111	270	128.0	2,344
14,285	21	1,071	280	125.0	2,400
13,636	22	1,034	290	120.0	2,500
13,555	22.13	1,000	300	115.4	2,600
13,043	23	967.7	310	113.0	2,655
12,685	23.65	937.5	320	111.1	2,700
12,500	24	909.1	330	107.1	2,800
12,400	24.19	882.3	340	103.4	2,900
12,000	25	857.1	350	100.0	3,000
11,538	26	833.3	360	96.77	3,100
11,111	27	810.8	370	93.75	3,200
10,714	28	789.5	380	90.91	3,300
10,690	28.17	769.2	390	88.24	3,400
10,345	29	750.0	400	85.71	3,500
10,000	30	731.7	410	80.09	3,750
9,677	31	714.3	420	78.95	3,800
9,375	32	697.7	430	76.92	3,900
9,250	32.43	681.8	440	75.00	4,000
9,091	33	667.7	450	71.34	4,200
8,910	33.67	652.2	460	70.59	4,250
8,823	34	638.3	470	66.67	4,500
8,571	35	625.0	480	63.83	4,700
8,556	35.06	612.2	490	63.16	4,750
8,333	36	600.0	500	60.00	5,000
8,290	36.19	588.3	510	54.54	5,500
8,108	37	576.9	520	50.00	6,000
7,895	38	566.0	530	46.15	6,500
7,692	39	555.8	540	42.86	7,000
7,500	40	545.4	550	40.00	7,500
7,317	41	535.7	560	37.50	8,000
7,143	42	526.3	570	35.29	8,500
6,985	42.95	517.1	580	34.29	8,750
6,977	43	508.5	590	33.33	9,000
6,818	44	500.0	600	31.58	9,500
6,667	45	461.5	650	30.00	10,000
6,521	46	428.6	700	27.27	11,000
6,383	47	400.0	750	25.00	12,000
6,309	47.62	375.0	800	24.19	12,400
6,250	48	352.9	850	23.08	13,000
6,122	49	333.3	900	21.43	14,000
6,000	50	315.8	950	20.00	15,000
5,454	55	300.0	1,000	18.75	16,000
5,000	60	285.7	1,050	17.65	17,000
4,700	64.85	272.7	1,100	16.67	18,000
4,615	65	260.9	1,150	16.00	18,750
4,390	68.33	250.0	1,200	15.79	19,000
4,286	70	240.0	1,250	15.00	20,000
4,000	75	232.6	1,290	12.00	25,000
		230.8	1,300	10.00	30,000

TABLE OF LETTERS THAT ARE ADDED AFTER DATE AND TIME GROUPS BY U. S. AND BRITISH NAVAL AUTHORITIES TO INDICATE TIME ZONE

Note: TIME OF ORIGIN OF ALL MESSAGES TO AND FROM UNITED NATIONS MERCHANT SHIPS WILL BE EXPRESSED IN GREENWICH MEAN (CIVIL) TIME; this is indicated by the suffix letter "Z" added to date and hour of origin.

Messages passed between military authorities may utilize any of the time zone suffixes appearing on the following table, which is included for information only.

Zone	Hours ahead of G.M.T.	Suffix
7½° W to 7½° E	0	Z
7½° E to 22½° E	1	A
22½° E to 37½° E	2	B
37½° E to 52½° E	3	C
52½° E to 67½° E	4	D
67½° E to 82½° E	5	E
82½° E to 97½° E	6	F
97½° E to 112½° E	7	G
112½° E to 127½° E	8	H
127½° E to 142½° E	9	I
142½° E to 157½° E	10	K
157½° E to 172½° E	11	L
172½° E to 180°	12	M

Zone	Hours behind G.M.T.	Suffix
7½° W to 22½° W	1	N*
22½° W to 37½° W	2	O
37½° W to 52½° W	3	P
52½° W to 67½° W	4	Q
67½° W to 82½° W	5	R
82½° W to 97½° W	6	S
97½° W to 112½° W	7	T
112½° W to 127½° W	8	U
127½° W to 142½° W	9	V
142½° W to 157½° W	10	W
157½° W to 172½° W	11	X
173½° W to 180°	12	Y

* The letter N is also used to designate 13 hours ahead of G.M.T. This is to provide for a ship near the meridian of 180° keeping Summer Time.

Example: 162014Z indicates a time of 8:14 p.m., Greenwich Mean (Civil) Time on the 16th of the month.

RESTRICTED

Frequency Guide

IRPL—M5

AUGUST, SEPTEMBER, OCTOBER, 1945

PREPARED BY INTERSERVICE RADIO PROPAGATION LABORATORY
National Bureau of Standards
Washington, D. C.

RESTRICTED

PL—M6

FREQUENCY GUIDE

AUGUST, SEPTEMBER, OCTOBER, 1945

PREPARED BY INTERSERVICE RADIO PROPAGATION LABORATORY

National Bureau of Standards

Washington, D. C.

These tables show frequency bands recommended for use under normal conditions for communication with locations at distances between 250 and 2500 nautical miles from the ship. (One nautical mile = 1.152 ordinary or "statute" miles = 1.852 kilometers.) The frequency bands listed as 4, 6, 8, 12, and 16 megacycles in the table cover frequencies approximately as follows:

Designated band:	Extension
4	4.0 to 4.4 Mc
6	6.0 to 6.6 Mc
8	8.0 to 8.8 Mc
12	12.0 to 13.2 Mc
16	16.0 to 17.6 Mc

Separate tables are furnished for use by ships located at each 10° of latitude as follows:

Latitude:	Page
70° N	3
60° N	4
50° N	5
40° N	6
30° N	7
20° N	8
10° N	9
0°	10
10° S	11
20° S	12
30° S	13
40° S	14
50° S	15

The tables herewith are for August, September, and October, 1945; tables for subsequent months will be forwarded periodically. The tables are for alternate hours of the day, local time at the ship, for the four principal directions (North, East, South, West) *from the ship*, and for transmission distances between 250 and 2500 nautical miles. When any frequency band shown in the table is not available, preference should be given to the next lower of the available bands. Dashes indicate times when the recommended frequency is lower than the 4-Mc band.

Recommended frequencies vary somewhat with longitude, particularly in temperate and tropical latitudes. The frequencies given here are for average conditions in the eastern hemisphere (mid-longitude 110° E) at latitudes north of the equator, frequencies will at times be somewhat higher than those given; at southern latitudes they will at times be somewhat lower. The reverse is true for the western hemisphere (mid-longitude 70° W), where at north latitudes frequencies will be at times somewhat lower, and at south latitudes somewhat higher than those given.

INSTRUCTIONS FOR USE

A. *When ship is not at exact latitude given in tables:*

The frequency listed for a given latitude is ordinarily usable within 5° of the given latitude.

> Example: A frequency listed for 20° N latitude will ordinarily be usable between 15° N and 25° N. South of 15° N the 10° N value should be used, and north of 25° N the 30° N value should be used

B. *When time of use does not coincide with hour given in tables:*

The frequency listed for a given hour local time is ordinarily usable within an hour of the given time.

> Example. A frequency listed for 0800 local time will be usable from 0700 and 0900 local time; before 0700 local time the 0600 local time value should be used, and after 0900 local time the 1000 local time value should be used

C. *When direction of transmission is not exactly N, E, S or W:*

The directions given in the column headings N, E, S, W, are the directions of transmission *from* the ship. For directions of transmission in the quadrants between any two of the directions given, the frequency used should be the *lower* of the two.

> Example: Ship at 10° N latitude, at 0400 local time, September 1945. Transmission is 1700 miles to the southeast. From the table, the frequency for transmission to the east is 6 Mc and for transmission to the south is 8 Mc. The frequency to be used is thus in the 6-Mc band.

D. *General example of use:*

> Ship at 22° S latitude, at 1925 local time, September 1945. Transmission is 800 miles to the northeast. 800 miles is between 500 and 1000 nautical miles. From the table for 20° S latitude, the frequency for this distance is 6 Mc for transmission north and 4 Mc for transmission east, at 2000 local time. The frequency to be used is thus in the 4-Mc band

Frequency Bands, in Megacycles Recommended for Radio Communication

70° N — AUGUST 1945

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,400				1,400–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	8	8	8	8	12	16	12	16	8	16	12	16	8	16	12	16	8	12	8	12	00
02	8	8	8	8	12	16	12	16	8	16	12	16	8	16	12	16	8	12	8	12	02
04	8	8	8	8	12	16	12	16	8	16	12	16	8	16	12	16	8	12	8	12	04
06	8	8	8	8	12	16	12	16	8	16	12	16	8	16	12	16	8	12	8	12	06
08	8	8	8	8	12	16	12	16	8	16	12	16	8	16	12	16	8	12	8	12	08
10	8	8	8	8	12	16	12	16	8	16	12	16	8	16	12	16	8	12	8	12	10
12	8	8	8	8	12	16	12	16	8	16	12	16	8	16	12	16	8	12	8	12	12
14	8	8	8	8	12	16	12	16	8	16	12	16	8	16	12	16	8	12	8	12	14
16	8	8	8	8	12	16	12	16	8	16	12	16	8	16	12	16	8	12	8	12	16
18	8	8	8	8	12	16	12	16	8	16	12	16	8	16	12	16	8	12	8	12	18
20	8	8	8	8	12	16	12	16	8	16	12	16	8	16	12	16	8	12	8	12	20
22	8	8	8	8	12	16	12	16	8	16	12	16	8	16	12	16	8	12	8	12	22

Frequency Bands, in Megacycles Recommended for Radio Communication

70° N — SEPTEMBER 1945

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,400				1,400–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	8	8	8	8	12	12	12	16	8	16	12	16	8	16	8	16	8	12	8	12	00
02	8	8	8	8	12	12	8	12	8	12	8	16	8	12	8	16	8	8	8	12	02
04	8	8	8	8	8	8	8	12	8	12	8	16	8	12	8	16	8	8	8	12	04
06	8	8	8	8	8	8	8	8	8	12	8	12	8	8	8	12	8	8	8	12	06
08	8	8	8	8	8	8	8	8	8	8	8	12	8	8	8	12	8	12	12	8	08
10	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	12	12	8	10
12	8	8	8	8	8	8	8	8	8	8	8	8	8	8	12	8	8	12	12	12	12
14	8	8	8	8	8	8	8	8	8	8	8	8	8	8	12	8	8	12	12	12	14
16	8	8	8	8	8	8	8	8	8	8	8	8	8	8	12	8	8	12	12	12	16
18	8	8	8	8	8	8	8	8	8	12	8	8	8	16	8	8	8	12	12	12	18
20	8	8	8	8	8	12	8	8	8	16	8	12	8	16	8	8	8	12	8	12	20
22	8	8	8	8	8	16	12	12	8	16	12	16	8	16	8	12	8	12	8	12	22

Frequency Bands, in Megacycles Recommended for Radio Communication

70° N — OCTOBER 1945

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,400				1,400–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	8	8	8	8	8	12	12	16	8	16	12	16	8	16	12	16	8	12	12	16	00
02	8	8	8	8	8	8	12	12	8	12	12	16	8	12	12	16	8	12	12	16	02
04	—	8	8	8	8	8	8	8	8	12	12	12	8	12	12	16	8	12	8	16	04
06	—	8	8	8	8	8	8	8	8	8	12	12	8	8	12	12	8	12	12	12	06
08	—	8	8	8	8	8	8	8	8	8	12	12	8	8	12	12	8	12	12	12	08
10	8	8	8	8	8	8	8	8	8	8	8	8	8	8	12	12	8	12	16	12	10
12	8	8	8	8	8	8	8	8	8	8	8	8	8	8	12	8	8	12	16	12	12
14	8	8	8	8	8	8	8	8	8	8	8	8	8	8	12	8	8	12	16	12	14
16	8	8	8	8	8	8	8	8	8	8	8	8	8	12	12	8	8	12	16	12	16
18	8	8	8	8	8	8	8	8	8	16	8	8	8	16	8	8	8	16	16	12	18
20	8	8	8	8	8	12	8	8	8	16	12	12	8	16	8	8	8	16	8	12	20
22	8	8	8	8	8	16	16	12	8	16	16	16	8	16	12	12	8	16	8	12	22

AUGUST 1945

Frequency Bands, in Megacycles Recommended for Radio Communication

60° N

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	8	6	6	6	16	12	8	12	16	12	8	16	16	12	8	12	8	12	8	8	00
02	6	4	4	6	12	8	8	8	16	12	8	12	16	12	8	12	12	8	8	12	02
04	8	4	4	4	8	8	8	8	16	8	8	12	12	8	8	12	8	8	8	12	04
06	4	4	4	4	8	6	6	8	12	8	6	8	12	8	8	8	8	12	8	8	06
08	4	4	4	4	8	8	8	6	12	12	12	8	8	12	12	8	8	12	16	8	08
10	6	6	6	6	8	8	8	8	12	12	16	12	8	12	16	12	8	12	16	8	10
12	6	6	6	6	8	8	8	8	8	12	16	12	8	12	16	12	8	12	16	12	12
14	6	6	4	6	6	8	8	8	8	8	12	12	8	8	12	12	8	12	16	12	14
16	6	6	4	4	6	6	6	6	8	8	12	8	8	8	12	8	8	12	12	12	16
18	6	6	4	4	6	6	6	6	8	8	8	8	8	8	12	8	8	12	12	12	18
20	6	6	4	4	8	6	6	6	16	12	8	8	12	12	8	8	8	8	12	12	20
22	6	6	4	4	16	12	6	8	16	16	6	6	16	12	8	8	8	12	8	12	22

SEPTEMBER 1945

Frequency Bands, in Megacycles Recommended for Radio Communication

60° N

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	4	4	---	4	8	6	4	6	16	8	6	8	16	8	6	8	12	6	6	8	00
02	4	4	---	4	8	6	6	6	16	8	6	8	16	8	4	8	12	6	6	6	02
04	---	---	---	---	6	6	4	6	12	8	6	8	12	8	4	8	8	8	6	6	04
06	---	---	---	---	6	6	6	6	12	8	6	8	12	8	8	8	8	12	8	6	06
08	4	6	4	4	6	6	6	6	8	8	8	8	8	8	8	8	8	12	12	8	08
10	4	6	4	4	6	6	6	6	8	8	12	8	8	12	12	8	12	12	16	12	10
12	4	4	4	4	6	6	8	6	8	8	12	8	8	12	12	8	12	12	16	12	12
14	4	4	4	4	6	6	6	6	8	8	12	8	8	12	12	12	8	12	16	12	14
16	4	4	4	4	6	6	6	6	8	8	8	8	8	12	12	12	8	12	16	12	16
18	4	4	4	4	6	6	6	6	8	8	8	8	8	8	12	12	8	8	12	12	18
20	4	4	4	4	8	6	6	6	16	8	8	8	8	8	8	8	8	8	12	12	20
22	4	4	---	4	8	6	6	6	16	8	8	8	16	8	8	8	8	6	8	6	22

OCTOBER 1945

Frequency Bands, in Megacycles Recommended for Radio Communication

60° N

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	6	6	4	6	12	8	8	8	16	12	8	12	16	12	8	12	8	12	8	12	00
02	6	4	4	4	8	8	8	8	16	12	8	12	12	12	8	12	12	12	8	12	02
04	6	6	4	4	8	8	6	8	12	12	8	12	8	12	8	12	8	12	8	12	04
06	6	6	6	6	8	8	8	8	12	12	12	12	8	12	8	12	8	12	8	12	06
08	6	6	6	6	8	8	8	8	8	12	12	12	8	12	12	12	8	12	16	12	08
10	4	4	6	4	6	6	8	8	8	8	12	12	8	12	12	12	8	16	16	12	10
12	4	4	4	4	6	6	6	6	8	8	12	8	8	12	16	12	8	16	16	12	12
14	4	4	6	4	6	6	6	6	8	8	12	8	8	12	16	12	8	12	16	16	14
16	4	4	4	4	6	6	6	6	8	8	8	8	8	8	12	12	8	12	16	16	16
18	4	4	4	6	8	6	6	6	12	8	8	8	8	8	12	12	8	8	12	12	18
20	4	4	4	6	8	8	6	8	16	12	8	8	12	12	8	8	8	12	8	12	20
22	6	6	4	6	12	8	8	8	16	12	8	12	12	12	8	12	8	12	8	8	22

Frequency Bands, in Megacycles Recommended for Radio Communication

50° N — AUGUST 1945

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00		4			8	6	6	6	12	8	8	8	16	8	6	8	16	8	8	8	00
02	4	4			8	6	6	6	12	8	8	8	12	8	6	8	16	8	8	8	02
04	4	4	4	4	6	6	6	6	12	8	6	8	12	8	6	8	12	8	6	8	04
06					6	6	6	4	8	8	8	8	12	12	8	8	12	12	8	8	06
08	4	6	6	4	8	8	8	8	12	16	16	8	12	16	12	8	12	16	12	8	08
10	6	6	6	6	8	12	12	12	12	16	16	16	12	16	16	16	12	16	16	16	10
12	6	6	6	6	8	8	12	12	12	16	16	16	12	12	16	16	12	12	16	16	12
14	4	4	6	4	8	8	8	8	12	12	16	12	8	12	12	16	8	12	16	16	14
16	6	4	4	4	8	8	8	8	8	12	12	12	8	12	12	12	8	12	16	12	16
18	4	4	4	4	6	6	8	8	8	8	12	12	8	12	12	12	8	12	16	12	18
20	4	4	4	4	6	6	6	6	8	8	8	8	12	8	12	12	16	8	12	12	20
22					6	6	6	6	12	8	8	8	16	8	8	8	16	8	8	12	22

Frequency Bands, in Megacycles Recommended for Radio Communication

50° N — SEPTEMBER 1945

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00					4				8	4	6	6	12	4	6	6	16	6	8	6	00
02					4				8	4	4	6	12	4	6	4	16	6	8	6	02
04					4	4			8	6	4	6	8	6	4	4	12	6	6	6	04
06					4	4	6	4	8	8	6	6	8	8	8	4	12	12	8	6	06
08	4	4	4	4	6	6	6	6	8	8	8	8	8	12	12	8	8	12	16	8	08
10	4	4	4	4	8	8	8	8	8	12	12	8	8	12	12	12	12	16	16	12	10
12	4	6	6	6	8	8	8	8	8	12	12	12	8	12	16	12	12	16	16	16	12
14	6	6	6	6	6	8	8	8	8	8	12	12	8	12	16	12	12	16	16	16	14
16	6	6	6	6	6	6	6	6	8	8	12	8	8	12	16	12	12	12	16	16	16
18	4	4	4	4	6	6	6	6	8	8	8	8	8	8	12	12	8	12	16	16	18
20	4	4	4	4	6	6	6	6	8	8	8	8	12	8	8	12	16	8	12	12	20
22					6	4	6	6	8	6	6	8	12	6	6	8	16	6	8	8	22

Frequency Bands, in Megacycles Recommended for Radio Communication

50° N — OCTOBER 1945

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	4	4	4	4	6	6	6	6	12	8	8	8	16	8	8	8	16	8	8	8	00
02	4	4	4	4	6	6	6	6	12	8	8	8	12	8	6	8	16	8	8	8	02
04	4	4	4	4	6	6	6	6	12	8	8	8	12	8	6	8	12	8	6	8	04
06	4	4	4	4	6	6	6	6	12	8	6	8	12	8	6	8	12	12	8	8	06
08	6	6	6	4	8	8	8	8	12	12	8	8	12	12	12	8	8	12	16	8	08
10	6	6	6	6	8	12	12	12	12	16	16	12	12	16	16	12	12	16	16	16	10
12	6	6	6	6	8	12	12	12	12	16	16	16	12	16	16	16	12	16	16	16	12
14	6	6	6	6	8	12	12	12	12	16	16	16	12	16	16	16	12	16	16	16	14
16	6	6	6	6	8	8	12	12	12	12	16	12	12	12	16	12	12	8	16	12	16
18	4	4	4	4	6	6	8	8	8	8	12	12	8	8	12	12	8	8	12	12	18
20	4	4	4	4	6	6	6	6	8	8	8	8	12	8	8	12	16	8	12	12	20
22					6	4	6	6	8	6	6	8	12	6	6	8	16	6	8	8	22

AUGUST 1945

Frequency Bands, in Megacycles Recommended for Radio Communication

40° N

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	---	---	---	---	6	6	---	4	8	8	6	6	8	6	8	6	12	8	8	6	00
02	4	---	---	---	6	6	---	6	8	8	6	6	8	8	8	8	12	8	8	8	02
04	---	---	---	---	4	6	---	4	8	8	4	6	8	8	6	8	12	8	8	6	04
06	---	---	---	---	6	6	4	4	8	6	6	6	8	8	8	8	8	12	12	6	06
08	6	6	4	6	12	12	8	8	12	16	12	12	12	16	12	8	12	16	12	8	08
10	8	6	6	6	12	12	12	12	16	16	16	12	16	16	16	16	12	16	16	16	10
12	8	6	6	6	12	12	12	12	16	16	16	16	16	16	16	16	12	16	16	16	12
14	6	6	4	6	8	8	8	12	12	12	12	16	12	12	16	16	12	12	16	16	14
16	6	6	6	6	8	8	6	8	12	12	12	12	12	12	16	12	12	16	16	12	16
18	4	4	6	6	8	8	6	6	12	8	12	12	8	12	16	12	12	12	16	16	18
20	4	6	6	4	6	6	6	6	8	8	8	8	8	8	12	12	12	8	12	12	20
22	---	---	---	---	6	6	6	6	8	6	6	6	8	6	8	8	8	8	8	12	22

SEPTEMBER 1945

Frequency Bands, in Megacycles Recommended for Radio Communication

40° N

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	---	---	---	---	---	---	---	---	6	4	6	4	6	6	8	6	8	6	8	8	00
02	---	---	---	---	---	---	---	---	4	4	4	4	6	4	8	6	8	6	8	6	02
04	---	---	---	---	---	---	---	---	4	4	4	4	6	4	6	6	6	6	8	6	04
06	---	---	---	---	4	4	4	---	6	8	6	4	8	8	8	4	8	12	12	6	06
08	4	4	6	6	8	8	6	6	8	12	12	8	8	12	16	8	8	16	16	12	08
10	6	6	6	6	8	8	8	8	12	12	12	12	12	12	16	12	12	16	16	16	10
12	6	6	6	6	8	8	8	8	12	12	12	12	12	16	16	12	12	16	16	16	12
14	6	6	6	6	8	8	8	8	12	12	12	12	12	16	16	16	12	16	16	16	14
16	6	6	6	6	6	8	8	8	8	12	12	12	12	12	16	16	12	16	16	16	16
18	6	6	6	6	6	6	6	6	8	8	12	12	12	12	16	12	12	12	16	16	18
20	4	4	4	4	6	6	4	6	8	8	8	8	8	8	12	12	8	8	16	12	20
22	---	---	---	---	6	---	---	4	8	4	6	6	8	6	8	8	8	6	12	8	22

OCTOBER 1945

Frequency Bands, in Megacycles Recommended for Radio Communication

40° N

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	---	4	---	4	6	6	4	6	8	8	6	8	8	8	6	8	12	8	8	6	00
02	---	4	---	4	6	6	---	6	8	8	4	8	8	8	6	8	12	6	8	6	02
04	---	---	---	4	6	6	---	6	8	8	4	8	8	8	6	8	12	8	8	6	04
06	4	---	---	---	6	6	4	6	8	8	6	6	12	12	8	6	12	16	8	6	06
08	6	6	6	6	8	8	8	6	12	12	12	8	12	16	16	12	12	16	16	12	08
10	6	6	6	6	8	8	8	8	12	12	16	12	12	16	16	16	12	16	16	16	10
12	6	6	8	6	8	8	8	8	12	12	16	12	12	16	16	16	16	16	16	16	12
14	6	6	8	6	8	8	8	8	12	12	16	12	12	16	16	16	16	16	16	16	14
16	6	6	6	6	8	8	8	8	12	12	16	12	12	12	16	16	12	16	16	16	16
18	4	4	4	4	6	6	6	6	8	8	8	8	8	8	12	12	12	8	16	16	18
20	---	4	---	6	6	6	4	6	8	8	6	8	8	8	8	8	8	6	12	12	20
22	---	4	---	4	6	6	---	6	8	8	6	8	8	8	8	8	12	8	8	8	22

Frequency Bands, in Megacycles Recommended for Radio Communication

30° N — AUGUST 1945

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00					4	4	4	4	6	6	8	6	8	8	6	8	8	8	12	8	00
02						4	4	4	6	6	6	6	8	8	8	8	8	8	12	8	02
04									6	4	6	6	8	6	8	6	8	8	8	8	04
06		4	4		4	4	4	4	6	8	8	6	8	12	8	6	8	12	8	8	06
08	6	6	6	4	8	8	8	6	12	12	12	8	16	12	12	12	12	16	12	12	08
10	6	6	6	6	8	12	12	8	16	16	16	16	16	16	16	16	16	16	16	16	10
12	6	6	6	6	8	8	12	12	16	16	16	16	16	16	16	16	16	16	16	16	12
14	6	6	6	6	8	8	8	8	12	12	12	12	16	16	16	16	12	16	16	16	14
16	6	6	6	6	6	6	8	8	12	12	16	12	12	16	16	16	12	16	16	16	16
18	6	6	6	6	6	6	8	8	8	8	12	12	12	12	16	16	12	12	16	16	18
20	4	4	4	4	6	4	6	6	8	8	8	8	12	8	16	12	12	8	16	16	20
22					4	4	4	4	6	6	8	6	8	8	12	8	8	8	12	12	22

Frequency Bands, in Megacycles Recommended for Radio Communication

30° N — SEPTEMBER 1945

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00							4			8	8		8	8	8		8	8	12	8	00
02										8	8		8	8	8		8	8	12	8	02
04										8	8		8	8	8		8	8	8	8	04
06		4	4		4	4	4	4	6	8	8	6	8	12	8	6	8	12	8	8	06
08	6	6	6	4	8	8	8	6	12	12	12	8	16	12	12	12	12	16	12	12	08
10	6	6	6	6	8	12	12	8	16	16	16	16	16	16	16	16	16	16	16	16	10
12	6	6	6	6	8	8	12	12	16	16	16	16	16	16	16	16	16	16	16	16	12
14	6	6	6	6	8	8	8	8	12	12	12	12	16	16	16	16	12	16	16	16	14
16	6	6	6	6	6	6	8	8	12	12	16	12	12	16	16	16	12	16	16	16	16
18	6	6	6	6	6	6	8	8	8	8	12	12	12	12	16	16	12	12	16	16	18
20	4	4	4	4	6	4	6	6	8	8	8	8	12	8	16	12	12	8	16	16	20
22					4	4	4	4	6	6	8	6	8	8	12	8	8	8	12	12	22

Frequency Bands, in Megacycles Recommended for Radio Communication

30° N — OCTOBER 1945

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00							4			8	8		8	8	8		8	8	12	8	00
02										8	8		8	8	8		8	8	12	8	02
04										8	8		8	8	8		8	8	8	8	04
06		4	4		4	4	4	4	6	8	8	6	8	12	8	6	8	16	8	8	06
08	6	6	6	4	8	8	8	6	12	12	12	8	16	12	12	12	12	16	12	12	08
10	6	6	6	6	8	12	12	8	16	16	16	16	16	16	16	16	16	16	16	16	10
12	6	6	6	6	8	8	12	12	16	16	16	16	16	16	16	16	16	16	16	16	12
14	6	6	6	6	8	8	8	8	12	12	12	12	16	16	16	16	12	16	16	16	14
16	6	6	6	6	6	6	8	8	12	12	16	12	12	16	16	16	12	16	16	16	16
18	6	6	6	6	6	6	8	8	8	8	12	12	12	12	16	16	12	12	16	16	18
20	4	4	4	4	6	4	6	6	8	8	8	8	12	8	16	12	12	8	16	16	20
22					4	4	4	4	6	6	8	6	8	8	12	8	8	8	12	12	22

AUGUST 1945

Frequency Bands, in Megacycles Recommended for Radio Communication

20° N

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	4	4	4	4	4	4	4	4	6	8	8	8	8	8	12	8	8	12	12	12	00
02	4	4	4	4	4	4	4	4	6	6	8	8	6	8	8	8	6	8	12	12	02
04							4	4	4	6	6	6	6	6	8	8	6	8	8	8	04
06	4	4	4	4	4	4	4	4	6	8	6	6	8	12	8	8	8	12	8	8	06
08	6	6	4	4	8	8	8	8	12	12	8	8	12	16	12	12	12	16	12	12	08
10	6	6	6	6	12	12	8	12	16	16	12	16	16	16	12	16	16	16	16	16	10
12	6	6	6	6	12	8	8	12	16	16	16	16	16	16	16	16	16	16	16	16	12
14	8	8	8	8	8	8	8	8	12	16	12	16	12	16	16	16	16	16	16	16	14
16	8	8	8	8	8	12	12	12	12	16	16	16	16	16	16	16	16	16	16	16	16
18	6	8	8	8	8	8	8	8	12	12	16	16	12	16	16	16	16	16	16	16	18
20	4	6	6	6	6	6	8	8	8	8	12	12	8	12	16	16	12	12	16	16	20
22	4	4	4	4	4	6	6	6	6	8	8	8	8	8	12	12	8	12	16	12	22

SEPTEMBER 1945

Frequency Bands, in Megacycles Recommended for Radio Communication

20° N

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	4	4	4	4	4	4	6	6	6	8	8	8	8	8	12	8	8	12	16	12	00
02	4	4	4	4	4	4	4	6	6	6	8	8	8	8	12	8	8	8	12	12	02
04							4	6	6	6	6	6	8	8	8	8	8	8	8	8	04
06	4	4	4	4	4	6	4	6	8	8	6	6	8	12	8	8	8	16	8	8	06
08	6	6	6	6	8	8	8	8	12	12	12	12	16	16	16	12	16	16	16	16	08
10	6	8	8	6	8	8	8	8	12	12	12	12	16	16	16	16	16	16	16	16	10
12	8	8	8	8	8	8	8	8	12	16	16	16	16	16	16	16	16	16	16	16	12
14	8	8	8	8	8	12	12	12	16	16	16	16	16	16	16	16	16	16	16	16	14
16	8	8	8	8	8	12	12	12	16	16	16	16	16	16	16	16	16	16	16	16	16
18	8	8	8	8	8	8	8	8	12	12	16	16	16	16	16	16	16	16	16	16	18
20	6	6	6	6	6	6	6	8	8	8	12	12	8	12	16	16	12	12	16	16	20
22	4	4	4	4	4	4	6	4	6	8	8	8	8	8	12	12	8	12	16	12	22

OCTOBER 1945

Frequency Bands, in Megacycles Recommended for Radio Communication

20° N

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	4	4	4	4	4	4	6	6	6	8	8	8	8	8	12	8	8	12	16	12	00
02	4	4	4	4	4	4	4	4	6	6	8	8	6	8	12	8	6	8	12	12	02
04							4	4	4	4	6	6	6	6	8	8	6	8	8	8	04
06	4	4	4	4	4	4	4	4	6	8	6	4	8	12	8	6	8	16	8	8	06
08	6	6	6	6	8	8	8	8	12	12	12	12	16	16	16	12	16	16	16	16	08
10	6	8	8	8	8	8	8	8	16	16	12	12	16	16	16	16	16	16	16	16	10
12	8	8	8	8	12	12	8	12	16	16	16	16	16	16	16	16	16	16	16	16	12
14	8	8	8	8	12	12	12	12	16	16	16	16	16	16	16	16	16	16	16	16	14
16	8	8	8	8	8	12	8	12	16	16	16	16	16	16	16	16	16	16	16	16	16
18	6	8	8	8	8	8	8	8	12	8	12	16	12	12	16	16	12	12	16	16	18
20	4	4	6	6	4	6	6	6	8	8	8	8	8	8	12	12	8	12	16	12	20
22	4	4	4	4	4	4	6	4	6	8	8	8	8	8	12	8	8	12	16	12	22

10° N — Frequency Bands, in Megacycles Recommended for Radio Communication — AUGUST 1945

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	4	4	4	4	6	6	6	6	8	8	8	8	8	12	12	12	8	12	12	12	00
02	4	4	4	4	4	4	4	4	8	8	8	8	8	8	8	12	8	8	12	12	02
04					4	4	4	4	6	6	6	6	6	6	8	8	8	8	8	8	04
06	4	4			4	4	4	4	8	8	6	6	8	12	8	6	8	12	8	8	06
08	4	4	4	4	6	6	8	6	12	12	12	8	12	12	12	12	16	16	12	12	08
10	6	6	6	6	8	8	12	8	16	16	16	12	16	16	16	12	16	16	16	16	10
12	6	6	6	6	8	12	12	12	16	16	16	16	16	16	16	16	16	16	16	16	12
14	8	8	6	6	8	12	12	12	16	16	16	16	16	16	16	16	16	16	16	16	14
16	8	8	8	8	12	12	12	12	16	16	16	16	16	16	16	16	16	16	16	16	16
18	8	8	8	8	8	8	8	8	16	12	12	16	16	16	12	16	16	16	16	16	18
20	6	6	6	6	8	8	8	8	12	12	12	12	12	16	12	16	12	16	12	16	20
22	4	4	6	6	6	6	6	6	8	8	8	8	8	12	12	12	8	12	12	16	22

10° N — Frequency Bands, in Megacycles Recommended for Radio Communication — SEPTEMBER 1945

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	4	6	6	6	6	6	6	6	8	8	12	8	8	12	12	12	8	12	16	16	00
02	4	4	4	6	4	4	6	6	8	8	8	8	8	8	12	12	8	8	12	12	02
04					4	4	4	4	6	6	6	6	6	6	8	8	8	8	8	8	04
06	4	4			4	4	4	4	8	8	6	6	8	12	8	6	12	16	8	8	06
08	6	6	6	6	8	8	8	8	12	12	12	12	16	16	16	12	16	16	16	16	08
10	8	8	8	8	8	8	8	8	12	12	12	12	16	16	16	16	16	16	16	16	10
12	8	8	8	8	8	8	8	8	16	12	12	12	16	16	16	16	16	16	16	16	12
14	8	8	8	8	12	8	8	8	16	16	12	16	16	16	16	16	16	16	16	16	14
16	8	8	8	8	12	8	8	8	16	16	12	16	16	16	16	16	16	16	16	16	16
18	8	8	8	8	8	8	8	8	16	12	12	16	16	16	16	16	16	16	16	16	18
20	6	6	6	6	8	8	8	8	8	12	12	12	12	12	16	16	12	16	16	16	20
22	6	6	6	6	6	6	8	6	8	8	12	12	8	12	16	12	8	16	16	16	22

10° N — Frequency Bands, in Megacycles Recommended for Radio Communication — OCTOBER 1945

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	6	6	6	6	6	6	8	6	8	8	12	8	8	12	12	12	8	16	16	16	00
02	4	4	4	4	4	4	6	6	8	8	8	8	8	8	12	12	8	8	12	16	02
04					4	4	4	4	6	6	6	6	6	6	8	8	8	8	8	8	04
06		4			4	4	4	4	6	8	6	6	8	12	8	6	8	16	8	8	06
08	6	6	6	6	8	8	8	8	12	12	12	12	16	16	16	12	16	16	16	16	08
10	8	8	8	8	8	8	8	8	16	12	12	12	16	16	16	16	16	16	16	16	10
12	8	8	8	8	8	8	8	8	16	16	16	16	16	16	16	16	16	16	16	16	12
14	8	8	8	8	8	8	8	8	16	16	16	16	16	16	16	16	16	16	16	16	14
16	8	8	8	8	8	8	8	8	16	16	16	16	16	16	16	16	16	16	16	16	16
18	6	6	6	6	8	8	8	8	12	12	16	12	16	16	16	16	16	16	16	16	18
20	6	6	6	6	6	6	8	6	8	8	12	12	8	12	16	16	8	16	16	16	20
22	4	6	6	6	6	6	8	6	8	8	12	8	8	12	16	12	8	16	16	16	22

AUGUST 1945

Frequency Bands, in Megacycles Recommended for Radio Communication

0°

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	4	4	4	4	6	6	6	6	8	8	8	8	12	12	8	12	12	12	8	12	00
02	4	4	4	4	4	4	4	6	8	8	8	8	8	8	8	12	8	8	8	12	02
04					4	4	4	4	6	6	6	6	8	6	6	8	8	8	8	12	04
06					4	4	4	4	6	8	6	6	8	12	6	6	12	12	6	8	06
08	4	6	6	6	8	8	8	8	8	12	12	12	12	16	12	12	12	16	12	12	08
10	6	6	8	6	12	12	12	12	12	16	16	16	12	16	12	16	16	16	16	16	10
12	8	8	8	8	12	12	12	12	16	16	16	16	16	16	16	16	16	16	16	16	12
14	8	8	8	8	12	12	8	12	16	16	16	16	16	16	16	16	16	16	16	16	14
16	6	6	6	6	12	12	8	12	16	16	16	16	16	16	12	16	16	16	16	16	16
18	6	6	6	6	8	8	6	8	16	12	8	12	16	16	12	16	16	16	16	16	18
20	6	6	6	6	8	6	6	6	12	8	8	12	16	12	12	16	16	16	12	16	20
22	6	6	4	6	6	6	6	6	8	8	8	8	12	12	8	12	12	12	12	16	22

SEPTEMBER 1945

Frequency Bands, in Megacycles Recommended for Radio Communication

0°

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	6	6	6	6	8	8	6	8	8	12	8	12	12	12	12	16	12	16	12	16	00
02	4	4	4	4	6	6	6	6	8	8	8	8	8	8	8	12	12	8	8	16	02
04					4	4	4	4	6	6	6	6	8	6	8	8	8	8	8	12	04
06					4	4	4	4	6	8	6	6	8	12	8	6	8	12	8	8	06
08	6	6	6	6	8	8	8	8	12	12	12	8	16	16	16	12	16	16	16	12	08
10	6	6	6	6	8	8	8	8	12	12	12	12	16	16	16	16	16	16	16	16	10
12	6	6	6	6	8	8	8	8	12	12	12	12	16	16	16	16	16	16	16	16	12
14	6	6	6	6	8	8	8	8	16	12	12	12	16	16	16	16	16	16	16	16	14
16	8	8	8	8	8	8	8	8	16	12	12	12	16	16	16	16	16	16	16	16	16
18	8	8	8	8	8	8	8	8	16	12	12	12	16	16	16	16	16	16	16	16	18
20	6	6	6	6	8	8	8	8	12	12	12	12	16	16	12	16	16	16	12	16	20
22	6	6	4	4	8	8	6	8	12	12	8	12	12	16	12	16	12	16	12	16	22

OCTOBER 1945

Frequency Bands, in Megacycles Recommended for Radio Communication

0°

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	[illegible]																				00
02																					02
04																					04
06																					06
08																					08
10																					10
12																					12
14																					14
16																					16
18																					18
20																					20
22																					22

Frequency Bands, in Megacycles Recommended for Radio Communication

10° S — AUGUST 1945

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	4	4	4	4	6	4	4	4	8	8	6	8	12	8	8	12	12	12	8	12	00
02	4	4	4	4	4	4	4	4	8	6	6	8	8	8	8	8	12	8	8	12	02
04	---	---	---	---	4	---	---	4	6	4	6	8	8	6	6	8	8	8	6	8	04
06	---	---	---	---	4	4	---	---	6	6	4	4	8	8	6	6	8	12	6	8	06
08	6	6	6	6	8	8	8	8	12	16	8	12	12	16	12	8	12	16	16	12	08
10	6	6	6	6	12	12	8	12	16	16	12	16	16	16	16	16	16	16	16	16	10
12	6	6	6	6	12	12	8	12	16	16	12	16	16	16	16	16	16	16	16	16	12
14	6	6	6	6	12	8	8	12	16	16	12	16	16	16	16	16	16	16	16	16	14
16	6	6	6	6	8	8	8	8	16	12	12	16	16	12	12	16	16	16	16	16	16
18	6	6	6	6	6	6	6	6	12	8	8	8	16	12	12	12	16	12	12	16	18
20	4	4	4	4	6	6	6	6	8	8	8	8	16	12	8	12	16	12	8	12	20
22	4	4	4	4	6	6	4	6	8	8	8	8	12	12	8	12	16	12	8	12	22

Frequency Bands, in Megacycles Recommended for Radio Communication

10° S — SEPTEMBER 1945

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	4	4	4	4	6	4	4	4	8	8	6	8	12	8	8	12	12	12	8	12	00
02	4	4	4	4	4	4	4	4	8	6	6	8	8	8	8	8	12	8	8	12	02
04	---	---	---	---	4	---	---	4	6	4	6	8	8	6	6	8	8	8	6	8	04
06	---	---	---	---	4	4	---	---	6	6	4	4	8	8	6	6	8	12	6	8	06
08	6	6	6	6	8	8	8	8	12	16	8	12	12	16	12	8	12	16	16	12	08
10	6	6	6	6	12	12	8	12	16	16	12	16	16	16	16	16	16	16	16	16	10
12	6	6	6	6	12	12	8	12	16	16	12	16	16	16	16	16	16	16	16	16	12
14	6	6	6	6	12	8	8	12	16	16	12	16	16	16	16	16	16	16	16	16	14
16	6	6	6	6	8	8	8	8	16	12	12	16	16	12	12	16	16	16	16	16	16
18	6	6	6	6	6	6	6	6	12	8	8	8	16	12	12	12	16	12	12	16	18
20	4	4	4	4	6	6	6	6	8	8	8	8	16	12	8	12	16	12	8	12	20
22	4	4	4	4	6	6	4	6	8	8	8	8	12	12	8	12	16	12	8	12	22

Frequency Bands, in Megacycles Recommended for Radio Communication

10° S — OCTOBER 1945

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	4	4	4	4	6	4	4	4	8	8	6	8	12	8	8	12	12	12	8	12	00
02	4	4	4	4	4	4	4	4	8	6	6	8	8	8	8	8	12	8	8	12	02
04	---	---	---	---	4	---	---	4	6	4	6	8	8	6	6	8	8	8	6	8	04
06	---	---	---	---	4	4	---	---	6	6	4	4	8	8	6	6	8	12	6	8	06
08	6	6	6	6	8	8	8	8	12	16	8	12	12	16	12	8	12	16	16	12	08
10	6	6	6	6	12	12	8	12	16	16	12	16	16	16	16	16	16	16	16	16	10
12	6	6	6	6	12	12	8	12	16	16	12	16	16	16	16	16	16	16	16	16	12
14	6	6	6	6	12	8	8	12	16	16	12	16	16	16	16	16	16	16	16	16	14
16	6	6	6	6	8	8	8	8	16	12	12	16	16	12	12	16	16	16	16	16	16
18	6	6	6	6	6	6	6	6	12	8	8	8	16	12	12	12	16	12	12	16	18
20	4	4	4	4	6	6	6	6	8	8	8	8	16	12	8	12	16	12	8	12	20
22	4	4	4	4	6	6	4	6	8	8	8	8	12	12	8	12	16	12	8	12	22

AUGUST 1945

Frequency Bands, in Megacycles Recommended for Radio Communication

20° S

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00					4	4	4	4	8	6	6	6	12	8	6	8	12	8	6	8	00
02					4	4		4	6	6	4	6	8	6	6	8	12	8	6	8	02
04									6	4	4	6	8	6	6	6	8	6	6	8	04
06									4	6	4	4	6	8	6	6	8	12	6	6	06
08	4	6	6	4	6	6	6	6	12	8	8	8	12	12	12	8	12	10	12	8	08
10	6	6	6	6	8	8	8	8	16	12	12	12	16	16	12	12	16	16	16	16	10
12	6	6	6	6	8	8	8	8	16	12	12	12	16	16	16	16	16	16	16	16	12
14	6	6	6	6	8	8	8	8	16	12	12	12	16	16	12	16	16	16	16	16	14
16	6	6	6	6	8	6	6	6	12	8	12	12	16	12	12	12	16	16	16	16	16
18	4	4	4	4	6	6	6	6	8	8	8	8	12	12	8	12	16	12	12	16	18
20	4	4	4	4	6	4	4	4	8	8	6	8	12	8	6	12	16	12	8	12	20
22	4	4		4	4	4	4	4	8	6	6	6	12	8	6	8	12	8	6	12	22

SEPTEMBER 1945

Frequency Bands, in Megacycles Recommended for Radio Communication

20° S

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	4	4	6	6	4	4	4	4	8	6	6	6	12	8	6	8	16	8	6	12	00
02	4	4		6	4	4	4	4	8	6	4	6	8	8	6	8	12	8	6	8	02
04					4			4	6	6	4	6	8	6	4	8	8	8	6	8	04
06					4	4	4	4	6	8	6	6	8	12	6	6	8	16	8	8	06
08	6	6	6	6	8	8	8	8	12	12	12	12	16	16	12	12	16	16	12	12	08
10	8	8	8	8	12	8	8	8	16	16	12	12	16	16	16	16	16	16	16	16	10
12	8	8	8	8	8	12	8	8	16	16	16	16	16	16	16	16	16	16	16	16	12
14	8	8	8	8	8	12	12	12	16	16	16	16	16	16	16	16	16	16	16	16	14
16	8	8	8	8	8	8	8	8	16	16	12	16	16	16	16	16	16	16	16	16	16
18	8	6	6	8	8	8	6	8	12	12	8	16	16	12	12	16	16	16	12	16	18
20	4	4	4	4	6	4	4	6	8	8	6	8	12	8	8	12	16	12	8	16	20
22	4	4	4	4	4	4	4	4	8	8	6	8	12	8	6	8	16	8	8	12	22

OCTOBER 1945

Frequency Bands, in Megacycles Recommended for Radio Communication

20° S

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	4	4	4	6	6	4	4	4	8	8	6	8	12	8	8	8	16	12	8	12	00
02	4	4	4	6	4	4	4	4	8	6	6	8	12	8	6	8	12	8	6	12	02
04					4			4	6	6	4	6	8	6	6	8	8	8	6	8	04
06	4	4	4	6	4	6	4	4	8	8	8	6	8	12	8	6	8	16	12	8	06
08	6	6	6	6	8	8	8	8	16	12	12	12	16	16	12	12	16	16	16	16	08
10	6	6	6	6	12	8	8	8	16	12	12	12	16	16	16	16	16	16	16	16	10
12	8	8	8	8	12	8	8	8	16	16	12	12	16	16	16	16	16	16	16	16	12
14	8	8	8	8	12	8	8	8	16	16	16	16	16	16	16	16	16	16	16	16	14
16	8	8	8	8	12	12	8	12	16	16	16	16	16	16	16	16	16	16	16	16	16
18	8	8	8	8	12	8	8	12	16	16	12	16	16	16	16	16	16	16	16	16	18
20	6	6	6	6	8	8	6	8	12	12	8	12	16	12	8	16	16	12	12	16	20
22	4	4	4	6	6	4	4	6	8	8	6	8	16	8	8	12	16	12	8	16	22

Frequency Bands, in Megacycles Recommended for Radio Communication

30° S — AUGUST 1945

Local Time at Ship	Distance in Nautical Miles and Direction from Ship: 250–500 N	E	S	W	500–1,000 N	E	S	W	1,000–1,500 N	E	S	W	1,500–2,000 N	E	S	W	2,000–2,500 N	E	S	W	Local Time at Ship
00					4				6	4	4	4	8	8	6	6	12	8	6	8	00
02									6	4	4	4	8	6	6	6	8	8	8	8	02
04									4	4	4	4	6	4	6	6	8	6	8	8	04
06									4	6	4	4	6	8	6	4	8	12	6	6	06
08	4	4	4	4	6	6	6	6	8	12	8	8	12	12	8	8	12	16	8	8	08
10	6	6	6	6	8	8	8	8	12	12	12	12	16	16	12	12	16	16	16	16	10
12	6	6	6	6	8	8	8	8	12	12	12	12	16	16	12	16	16	16	16	16	12
14	6	6	6	6	8	8	8	8	12	12	12	12	16	12	12	16	16	16	16	16	14
16	6	6	6	6	6	8	6	6	12	8	8	8	12	12	12	12	16	12	16	16	16
18	4	4	4	4	6	6	4	6	8	8	8	8	12	8	8	12	16	8	12	16	18
20					4			6	8	6	6	8	8	6	8	8	12	8	8	8	20
22									6	4	4	6	8	8	6	6	12	8	6	8	22

Frequency Bands, in Megacycles Recommended for Radio Communication

30° S — SEPTEMBER 1945

Local Time at Ship	Distance in Nautical Miles and Direction from Ship: 250–500 N	E	S	W	500–1,000 N	E	S	W	1,000–1,500 N	E	S	W	1,500–2,000 N	E	S	W	2,000–2,500 N	E	S	W	Local Time at Ship
00									6	4	4	6	8	6	6	6	12	8	6	8	00
02									4	4	4	4	8	6	4	6	8	8	6	8	02
04									4	4	4	4	6	6	4	6	8	8	4	8	04
06					4	4	4		6	8	6	4	8	12	6	6	8	12	6	6	06
08	6	6	6	6	6	6	6	6	12	12	8	8	16	16	12	12	16	16	12	12	08
10	8	6	8	6	8	8	8	8	12	12	12	12	16	16	12	16	16	16	16	16	10
12	8	8	8	8	8	8	8	8	16	16	12	16	16	16	16	16	16	16	16	16	12
14	8	8	8	8	8	8	8	8	16	16	12	16	16	16	16	16	16	16	16	16	14
16	6	8	6	6	8	8	6	8	16	16	16	16	16	12	12	16	16	16	12	16	16
18	6	6	4	6	6	6	6	6	12	8	8	12	16	8	12	12	16	12	12	16	18
20	4	4	4	4	6	6	4	4	8	6	6	8	12	8	8	8	16	8	8	12	20
22					4			4	6	4	4	6	8	6	6	8	12	8	6	8	22

Frequency Bands, in Megacycles Recommended for Radio Communication

10° S — OCTOBER 1945

Local Time at Ship	Distance in Nautical Miles and Direction from Ship: 250–500 N	E	S	W	500–1,000 N	E	S	W	1,000–1,500 N	E	S	W	1,500–2,000 N	E	S	W	2,000–2,500 N	E	S	W	Local Time at Ship
00					4	4		4	8	6	6	6	12	8	6	8	12	8	6	8	00
02					4			4	6	6	6	6	8	6	6	8	12	8	8	8	02
04									6	4	6	4	8	6	6	6	8	8	8	8	04
06	4	4	4	4	4	6	4	4	8	8	8	6	8	12	8	6	12	10	8	8	06
08	6	6	6	6	8	8	6	6	12	12	8	8	16	12	12	12	16	16	12	12	08
10	6	6	6	6	8	8	8	8	12	12	12	12	16	16	12	12	16	16	12	16	10
12	8	8	6	6	8	8	8	8	16	12	12	12	16	16	16	16	16	16	16	16	12
14	8	8	8	8	8	8	8	8	16	12	12	12	16	16	12	16	16	16	16	16	14
16	8	8	8	8	8	8	8	8	16	12	12	12	16	16	12	16	16	16	16	16	16
18	8	6	6	6	8	8	6	8	16	12	8	12	16	16	12	16	16	16	12	16	18
20	6	4	4	6	6	4	4	6	12	8	8	12	16	8	8	12	16	8	8	12	20
22					4	4	4	4	8	6	6	6	12	8	8	8	16	8	8	8	22

AUGUST 1945

Frequency Bands, in Megacycles
Recommended for Radio Communication

40° S

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00						4	6	6	4	6	8	6	6	6	8	6	8	6	6	8	00
02							6		4	6	6	6	6	4	8	8	6	6	8	6	02
04							6		4	6	6	6	6	4	8	6	6	6	8	6	04
06							6		4	6	6	4	6	6	8	6	6	6	8	6	06
08	4	4	4	4	6	6	6	6	6	8	8	6	12	12	8	6	14	10	8	6	08
10	6	6	6	6	8	8	6	6	10	12	8	8	16	12	12	12	16	16	12	12	10
12	8	6	6	6	8	8	8	8	12	12	12	12	16	16	12	12	16	16	16	16	12
14	6	6	6	6	8	8	8	8	12	12	12	12	16	12	12	16	16	16	12	16	14
16	6	6	6	6	6	6	6	6	8	8	8	12	12	12	12	12	16	12	12	16	16
18	4	4	4	4	4	4	4	4	8	6	6	8	12	8	8	12	12	8	8	12	18
20						4	4	4	6	6	6	8	8	6	8	8	8	8	8	8	20
22						4	4	4	4	6	6	6	6	6	8	6	8	6	8	8	22

SEPTEMBER 1945

Frequency Bands, in Megacycles
Recommended for Radio Communication

40° S

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00									4	6	6	6	6	6	4	6	8	6	6	8	00
02									4	4	6	6	6	4	4	6	6	6	6	6	02
04									4	6	6	4	6	4	4	4	6	6	4	6	04
06					4	4	6		6	8	6	6	8	8	6	4	8	12	6	4	06
08	4	4	4	4	6	6	6	6	8	8	8	8	12	12	8	8	16	16	8	8	08
10	6	6	6	6	8	8	8	8	12	12	8	12	16	16	12	12	16	16	12	16	10
12	6	6	6	6	8	8	8	8	16	12	12	12	16	16	12	16	16	16	12	16	12
14	6	6	6	6	8	8	8	8	16	12	8	12	16	16	12	16	16	16	12	16	14
16	6	6	6	6	8	8	8	6	12	8	8	12	16	12	12	16	16	16	12	16	16
18	4	4	4	4	6	6	6	6	8	8	8	8	12	8	12	12	16	12	16	16	18
20	4			4	4	4	4	4	8	8	8	8	8	8	8	8	12	8	8	12	20
22									8	8	6	6	8	6	6	8	8	8	8	8	22

OCTOBER 1945

Frequency Bands, in Megacycles
Recommended for Radio Communication

40° S

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00									6	4	4	4	8	6	8	6	8	8	8	8	00
02						4	6	4	6	6	8	6	8	6	8	6	8	6	8	8	02
04						4	6	4	6	6	8	6	6	6	8	6	8	8	8	6	04
06	4	4	4	4	4	4	4	4	8	8	6	6	8	12	8	6	12	12	12	6	06
08	6	4	4	4	6	6	6	6	8	12	12	8	12	12	12	12	16	16	12	12	08
10	6	6	6	6	8	8	8	8	12	12	12	12	16	16	12	12	16	16	12	16	10
12	6	6	6	6	8	8	8	8	12	12	12	12	16	16	12	16	16	16	12	16	12
14	6	6	6	6	8	8	8	8	12	12	12	12	16	12	12	16	16	16	12	16	14
16	6	6	6	6	8	6	6	6	12	8	8	12	16	12	12	12	16	16	12	16	16
18	6	4	6	6	6	6	6	6	12	8	8	8	16	12	12	12	16	12	12	16	18
20	4	4	6	6	4	4	4	6	8	8	8	8	12	8	8	12	16	8	12	12	20
22					4	4	4	4	6	6	6	6	8	6	8	8	12	8	12	8	22

50° S

Frequency Bands, in Megacycles Recommended for Radio Communication

AUGUST 1945

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	---	---	---	---	4	6	6	6	6	8	8	8	6	8	12	8	6	6	16	6	00
02	---	---	---	---	4	4	6	6	6	6	8	8	6	6	12	8	6	6	12	6	02
04	---	---	---	---	4	4	6	6	6	8	8	6	4	6	12	6	6	8	16	6	04
06	---	---	---	---	4	4	6	6	6	6	8	8	4	6	12	6	6	8	12	6	06
08	4	4	---	---	4	6	6	4	8	8	8	6	12	12	12	6	12	12	12	6	08
10	6	6	4	4	6	8	8	6	8	12	12	8	12	12	12	12	16	16	8	12	10
12	6	6	6	6	6	6	6	6	12	12	8	12	16	12	8	12	16	16	12	16	12
14	6	6	6	6	6	6	6	6	12	12	8	12	12	12	12	12	16	16	12	16	14
16	6	6	6	6	6	6	6	6	8	8	8	8	12	12	8	12	16	12	12	16	16
18	4	4	4	4	4	4	4	4	8	6	8	8	8	8	8	12	12	8	8	12	18
20	---	---	---	---	4	4	4	4	6	6	6	6	8	6	8	8	8	6	12	8	20
22	---	---	---	---	4	4	4	4	6	8	8	6	6	8	12	6	8	6	16	8	22

50° S

Frequency Bands, in Megacycles Recommended for Radio Communication

SEPTEMBER 1945

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	---	---	---	---	---	---	---	---	4	4	8	4	6	4	12	6	8	6	16	6	00
02	---	---	---	---	---	---	---	---	4	4	6	4	4	4	8	4	6	4	12	6	02
04	---	---	---	---	---	---	---	---	4	4	4	4	4	4	8	4	6	6	12	4	04
06	---	---	---	---	4	4	4	---	6	8	4	4	6	8	6	4	8	12	8	4	06
08	4	4	4	4	6	6	6	6	8	8	8	8	12	12	8	8	16	12	8	8	08
10	4	4	4	4	8	6	6	6	12	8	8	8	12	12	8	12	16	16	8	12	10
12	6	4	4	4	8	8	6	8	12	12	8	12	16	12	8	12	16	16	8	16	12
14	6	4	4	4	8	8	6	8	12	8	8	12	16	12	8	12	16	12	8	16	14
16	4	4	4	4	6	6	6	6	8	8	8	8	12	12	8	12	16	12	8	16	16
18	4	4	4	4	6	6	4	6	8	8	8	8	12	8	8	12	12	8	12	12	18
20	---	---	---	4	4	4	4	4	6	6	8	8	8	6	12	8	8	8	16	12	20
22	---	---	---	---	---	---	---	---	4	4	6	4	6	6	12	8	8	6	16	8	22

50° S

Frequency Bands, in Megacycles Recommended for Radio Communication

OCTOBER 1945

Local Time at Ship	Distance in Nautical Miles and Direction from Ship																				Local Time at Ship
	250–500				500–1,000				1,000–1,500				1,500–2,000				2,000–2,500				
	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	N	E	S	W	
00	---	---	---	---	---	6	6	4	4	6	12	6	6	6	12	6	8	8	16	8	00
02	---	6	4	---	6	6	6	6	6	8	12	8	6	6	12	6	8	8	16	6	02
04	---	4	4	4	6	6	6	6	6	6	8	8	6	6	12	8	6	8	12	8	04
06	4	4	4	---	4	6	8	4	8	12	12	6	8	12	12	6	12	12	12	8	06
08	6	6	6	6	8	8	8	8	8	12	12	12	12	12	12	12	16	12	12	8	08
10	6	6	6	6	8	8	8	8	12	12	12	12	16	12	12	12	16	16	8	12	10
12	6	6	6	6	8	8	8	8	12	12	12	12	16	12	8	12	16	16	12	12	12
14	6	6	6	6	8	8	8	8	12	12	12	12	16	12	12	12	16	16	12	16	14
16	6	4	4	4	6	6	8	8	8	8	12	12	12	12	12	12	16	12	12	16	16
18	4	4	4	4	6	6	6	6	8	8	12	8	12	8	12	12	16	12	12	12	18
20	4	4	4	4	4	4	6	6	8	8	12	8	8	8	12	12	12	8	16	12	20
22	---	---	4	---	4	6	6	6	6	8	12	8	8	6	12	8	8	6	16	12	22

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