

RESTRICTED

B.R. 1792

Communication Training Manual

(Short Title C.T.M.)

Revised 1959

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Signal Division
ADMIRALTY

Admiralty, S.W.1.

23rd April, 1959

S.D.2262/56.

B.R. 1792 (Restricted), *Communication Training Manual*, 1959, having been approved by My Lords Commissioners of the Admiralty, is hereby promulgated.

B.R. 1792 (Restricted), *Signal Training Manual*, 1949, is hereby superseded and should be disposed of in accordance with the instructions in B.R.1.

By Command of Their Lordships,

J. G. Lang

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Chapter 1

GENERAL

Section 1

COMMUNICATION CATEGORIES AND DUTIES

101. Communication Branch Categories

a. The Communication Branch contains the following categories of ratings:—

(1) Long Service Radio Operator—

Junior Radio Operator	(J.R.O.)
Radio Operator 3rd Class	(R.O.3)
Radio Operator 2nd Class	(R.O.2)

(2) Long Service Radio Operator—General Radio Sub-Specialisation—

Radio Operator 2nd Class (G)	(R.O.2 (G))
Radio Operator 1st Class (G)	(R.O.1 (G))
Leading Radio Operator (G)	(L.R.O. (G))
Radio Supervisor	(R.S.)
Chief Radio Supervisor	(C.R.S.)
Radio Communication Instructor	(R.C.I.)

(3) Long Service Radio Operator—Tactical Sub-Specialisation—

Radio Operator 2nd Class (T)	(R.O.2 (T))
Radio Operator 1st Class (T)	(R.O.1 (T))
Leading Radio Operator (T)	(L.R.O. (T))
Communication Yeoman	(C.Y.)
Chief Communication Yeoman	(C.C.Y.)
Tactical Communication Instructor	(T.C.I.)

(4) Long Service Radio Operator—Electronic Warfare Sub-Specialisation—

Radio Operator 2nd Class	(R.O.2 (W))
Radio Operator 1st Class	(R.O.1 (W))
Leading Radio Operator (W)	(L.R.O. (W))
Radio Supervisor (W)	(R.S. (W))
Chief Radio Supervisor (W)	(C.R.S. (W))
Electronic Warfare Instructor	(E.W.I.)

(5) Royal Naval Reserve Radio Communication Operator—

Junior Radio Communication Operator, R.N.R.
Radio Communication Operator 3rd Class, R.N.R.
Radio Communication Operator 2nd Class, R.N.R.
Radio Communication Operator 1st Class, R.N.R.
Leading Radio Communication Operator, R.N.R.
Radio Communication Supervisor, R.N.R.
Chief Radio Communication Supervisor, R.N.R.

(6) Royal Naval Reserve Tactical Communication Operator—

Junior Tactical Communication Operator, R.N.R.
Tactical Communication Operator 3rd Class, R.N.R.
Tactical Communication Operator 2nd Class, R.N.R.
Tactical Communication Operator 1st Class, R.N.R.
Leading Tactical Communication Operator, R.N.R.
Communication Yeoman, R.N.R.
Chief Communication Yeoman, R.N.R.

(7) Royal Naval Reserve Radio Operator Special—

Radio Operator Special 3rd Class, R.N.R.
Radio Operator Special 2nd Class, R.N.R.
Radio Operator Special 1st Class, R.N.R.
Leading Radio Operator Special, R.N.R.
Radio Supervisor Special, R.N.R.
Chief Radio Supervisor Special, R.N.R.

(8) Women's Royal Naval Service—

Wren Radio Operator (M).
Leading Wren Radio Operator (M).
Petty Officer Wren Radio Supervisor (M).
Chief Wren Radio Supervisor (M).

(9) Women's Royal Naval Service—

Wren Radio Operator.
Leading Wren Radio Operator.
Petty Officer Wren Radio Supervisor.
Chief Wren Radio Supervisor.

(10) Women's Royal Naval Service—

Wren Switchboard Operator.
Leading Wren Switchboard Operator.
Petty Officer Wren Switchboard Operator.
Chief Wren Switchboard Operator.

(11) Women's Royal Naval Reserve—

Wren Radio Operator W.R.N.R.
Leading Wren Radio Operator W.R.N.R.
Petty Officer Wren Radio Supervisor W.R.N.R.
Chief Wren Radio Supervisor W.R.N.R.

102. Capabilities and Employment of Junior Rates

(a) *Radio Operator (on completion of New Entry Training).*—He has been trained as a practical operator in the four primary means of communications—Manual Morse, Flashing, Voice and A.T. He has received instruction in message handling, cryptography and the basic principles of Electronic Warfare.

He should be given as wide experience as possible in exercising all the skills for which he has been trained.

(b) *Radio Operator 2nd Class.*—A Radio Operator 2nd Class should have consolidated his practical skills and have become a reliable operator in Manual Morse, Flashing, Voice and A.T. He should have acquired a good knowledge of Communication subjects in general by instruction, self study and experience.

He should be given every opportunity to work in the Tactical, General Radio and Electronic Warfare sub-departments.

(c) *Radio Operator 2nd Class (T).*—He should have a thorough knowledge of Fleetwork. He must be a skilled operator in Flashing, Voice and A.T. and a reliable operator in Manual Morse. He must have a good knowledge of message handling and cryptography and be able to send and receive semaphore at eight w.p.m.

He should normally be employed in the Tactical sub department when at sea. In harbour or when ashore, he may be employed in any capacity for which his common training has made him suitable.

(d) *Radio Operator 2nd Class (G).*—He should have a thorough knowledge of selected radio equipment. He must be a skilled operator in Fast Manual Morse, Voice and A.T. He must have a good knowledge of message handling and cryptography and be a reliable operator in Flashing. He must be a competent HF DF operator.

He should normally be employed in the General Radio sub-department when at sea. In harbour or when ashore, he may be employed in any capacity for which his common training has made him suitable.

(e) *Radio Operator 2nd Class (W).*—He should have a thorough knowledge of selected E.W. equipment, Radar recognition and E.W. practical procedures. He must be a skilled operator in Manual Morse and A.T. He must have a good knowledge of message handling and cryptography and be a reliable operator in Flashing and Voice.

He should normally be employed in the Electronic Warfare sub-department when at sea. In harbour or when ashore, he may be employed in any capacity for which his common training has made him suitable.

103. Leading Radio Operator (T)

A Leading Radio Operator (T) may be employed as follows:—

- (a) Controlling operator on the more important Tactical Voice and A.T. circuits.
- (b) Leading Hand of a V.S. watch.
- (c) Working opposite the Communication Yeoman attending on the command in small ships.
- (d) Duty Senior Communication Rating in harbour in small ships.
- (e) Leading Hand of a Cryptographic or M.S.O. watch.
- (f) Routeing operator and in charge of A.T. circuits (Radio or T.P.) in shore stations.
- (g) In charge communication department in certain small ships.

104. Leading Radio Operator (G)

A Leading Radio Operator (G) may be employed as follows:—

- (a) Controlling operator on the more important W/T, A.T. and Voice circuits.
- (b) Leading Hand of the Watch in wireless offices.
- (c) Duty Senior Communication Rating in harbour in small ships.
- (d) Leading Hand of Cryptographic or M.S.O. watch.
- (e) Routeing operator and in charge of certain circuits in shore stations.
- (f) In charge communication department in certain small ships.

105. Leading Radio Operator (W)

A Leading Radio Operator (W) may be employed as follows:—

- (a) Controlling operator on certain E.W. nets.
- (b) In charge of an E.W. watch.
- (c) Duty Senior Communication Rating in harbour in small ships.
- (d) Leading Hand of Cryptographic or M.S.O. watch.
- (e) Leading Hand of the Watch in wireless offices.
- (f) Routeing operator and in charge A.T. circuits (Radio or T.P.) in shore stations.
- (g) In charge of E.W. sub-department in small ships.

106. Communication Yeoman

A Communication Yeoman may be employed as follows:—

- (a) In charge of the Tactical sub-department in a small ship.
- (b) Yeoman of the Watch in a large ship.
- (c) Duty Communication Petty Officer in a large ship.
- (d) Rating in charge of message handling or cryptography afloat or ashore.
- (e) In charge of A.T. room in a shore station.

107. Radio Supervisor

A Radio Supervisor may be employed as follows:—

- (a) In charge of the radio communication department in a small ship.
- (b) In charge of the Wireless watch in a large ship.
- (c) Duty Communication Petty Officer in a large ship.
- (d) Rating in charge of message handling or cryptography afloat or ashore.
- (e) In charge of the A.T. room or W/T watch in a shore station.

108. Radio Supervisor (W)

A Radio Supervisor (W) may be employed as follows:—

- (a) In charge of the Electronic Warfare sub-department in certain ships.
- (b) E.W. Controller.
- (c) Duty Communication Petty Officer in a large ship.
- (d) Rating in charge of message handling or cryptography afloat or ashore.
- (e) In charge of the A.T. room in a shore station.

109. Chief Communication Yeoman

A Chief Communication Yeoman may be employed as follows:—

- (a) In charge of the Tactical sub-department of Squadron Leaders and above.
- (b) In charge of the watch in a large shore communication centre.
- (c) As an instructor of Junior Rates.

110. Chief Radio Supervisor

A Chief Radio Supervisor will normally be employed as follows:—

- (a) In charge of the Radio Communication sub-department of Squadron Leaders and above.
- (b) In charge of the watch in a large shore communication centre or wireless station.
- (c) As an instructor of Junior Rates.

111. Chief Radio Supervisor (W)

A Chief Radio Supervisor (W) may be employed as follows:—

- (a) In charge of the E.W. sub-department.
- (b) As an E.W. Controller.
- (c) In charge of the watch in a large shore communication centre.
- (d) As an instructor of Junior Rates.

112. The Instructor Rate

(a) The specialist qualification of Tactical Communication Instructor, Radio Communication Instructor or Electronic Warfare Instructor is awarded to Chief Petty Officer and Petty Officer rates of the three sub-specialisations who successfully complete the appropriate qualifying course in H.M.S. *Mercury*.

(b) Instructors are frequently required to carry out the same duties as men of equivalent rate who do not hold the Instructor qualification. They are, however, whenever possible, drafted to ships or establishments where Instructor rates are allowed by scheme of complement. Their responsibilities include the following:—

- (1) Instructing officers and senior ratings.
- (2) Assisting the Staff Communications Officers of Commanders-in-Chief, Flag Officers and Captains (D) and (F) in organising communication training.

113. Spare

114. Radio Special Branch

Radio Operators of all sub-specialisations are eligible for selection for the Radio Special Branch. Further details are to be found in current Fleet Orders.

115. Volunteers for Parachute Training

(a) From time to time volunteers are required from Radio Supervisors, Leading Radio Operators (G), Radio Operators 1st and 2nd class (G) for parachute training, and subsequent attachment to 95 Amphibious Observation Regiment, Royal Artillery, for duty with Naval Gunfire Support Forward Observer Parties.

(b) Names of recommended volunteers should be reported to the Commodore, Naval Drafting, who will maintain a list of volunteers and consider them in the course of their normal drafting cycle.

(c) A high standard of physical fitness is required, and details are given in B.R. 1750, *A Handbook of Naval Medical Standards*, Article 0428.

116-130. Spare

COMMUNICATION TRAINING ORGANISATION

131. Responsibilities of the Captain, H.M.S. Mercury

- (a) The Captain, H.M.S. *Mercury*, is responsible for the co-ordination of training and examination of all officers and men in communications and electronic warfare as directed by the Admiralty.
- (b) He is authorised to deal direct with other signal schools and signal training centres, and other training establishments on these matters.
- (c) He is also responsible for advising the Admiralty on the communication and electronic warfare syllabi of other branches.

132. The Signal School and Signal Training Centres

- (a) The signal schools and signal training centres and their tasks are described in the following paragraphs:—
- (b) H.M.S. *Mercury*. The training of:—
 - (1) Officers' courses.
 - (2) N.A.T.O. officers' and ratings' courses.
 - (3) New Entry Radio Operators.
 - (4) New Entry W.R.N.S. Communication. Switchboard Operator Ratings are trained at R.N.A.S., Culdrose.
 - (5) Sub-specialisation courses for Radio Operators 2nd Class.
 - (6) Advancement courses for Petty Officer rates.
 - (7) Qualifying courses for the Instructor rate.
 - (8) P.C.T. and refresher courses.
 - (9) Advancement courses for Reserve Leading and Petty Officer rates.
 - (10) Advancement courses for W.R.N.S. Communication rates.
- (c) Signal Training Centre, Devonport.
 - (1) Refresher training for Communication ratings from ships and establishments in the Devonport area and for ratings awaiting draft.
 - (2) Courses and examinations for Tactical and Radio Operators 2nd and 3rd Class in the Reserve Communication categories.
 - (3) Advancement courses for W.R.N.R. Communication rates.
- (d) H.M.S. *Ganges*. Initial training of Junior Radio Operators (U).
- (e) Signal Training Centre, Malta.
 - (1) Sub-specialisation courses for Radio Operators 2nd Class.
 - (2) Qualifying courses for Leading W.R.N.S. Communication.
 - (3) Examinations and refresher training for Communication ratings on the Mediterranean Station.
- (f) Signal Training Centre, Singapore.
 - (1) Sub-specialisation courses for Radio Operators 2nd Class.
 - (2) Examinations and refresher training for Communication ratings on the Far East Station.

133. Commonwealth Signal Schools and Training Centres

- (a) Commonwealth signal schools and training centres are established as follows:—
 - (1) R.A.N. Signal School at Flinders, near Melbourne.
 - (2) R.N.Z.N. Signal Training Centre at Auckland.
 - (3) H.M. Canadian Communication Training Centre at Halifax.
 - (4) I.N. Signal School at Cochin.
 - (5) P.N. Signal School at Karachi.
- (b) In addition to conducting the communication training of their own services, these establishments will, when requested, undertake refresher courses for R.N. Communication ratings.

134. Preparation of Syllabi

Copies of H.M.S. *Mercury* syllabi other than those for new entries will be forwarded automatically to signal training centres and to Commonwealth signal schools and S.T.C.s. R.N. establishments are to base their syllabi on those supplied by H.M.S. *Mercury*.

135. Conduct of Examinations

(a) Examination subjects and passing percentages for advancement in the Communication Branch are laid down in Section 3 of Chapters 2, 4 and 5.

(b) Applications for examinations are to be forwarded as explained in paragraphs 222, 226 and 235.

(c) Examinations are to be conducted by qualified Communication officers.

(d) Examination papers are to be set and corrected locally. Specimen examination papers for Leading rate will be forwarded to Commanders-in-Chief and signal training centres abroad once a term by H.M.S. *Mercury* to provide a standard for comparison.

(e) All examinations are to be invigilated by an officer whenever possible.

(f) Chief Petty Officers are, however, authorised to invigilate written examinations for Sub-specialist and New Entry courses except that class instructors are not to invigilate their own classes.

(g) An officer is to start and stop all examinations.

(h) Before starting, the attention of candidates is to be drawn to any instructions printed at the head of each paper.

(i) Candidates are not permitted to bring into the examination room any notes or books other than those specifically stated on the examination paper.

(j) Anybody found receiving or giving assistance, or using unauthorised notes, is to be dismissed from the examination room and, normally, disciplinary action is to be taken. Ratings on course found guilty of such an offence will, in addition to any punishment awarded, be removed from the course.

136. Return of Ratings Examined

(a) So that the advancement of ratings shall not be delayed, it is important that returns of all examination results should be rendered immediately on completion of the examination. Forms S.1124A and S.1124 are provided for this purpose for Radio Operators (T) and Radio Operators (G) (W) respectively.

(b) The officer who actually conducts the examination is to sign as the examining officer.

(c) The name of the ship in which each candidate is serving is to be shown on the returns; one copy of the return is to be sent to each of the following:—

The Commodore Naval Drafting.

The Captain, H.M.S. *Mercury*.

The Administrative Authority of the rating's ship.

The Commanding Officer of each rating's ship.

The Commander-in-Chief (on foreign stations only).

(d) The basic date for ratings examined for Leading rate or above is the date on which they volunteered and were recommended. The basic date is always to be shown on Forms S.1124 and S.1124A. In the case of failures, the date to be shown is the date on which they completed the examination.

(e) When a rating passes an examination in all subjects other than those in which he may be re-examined (in accordance with paragraph 226 (g)), the "Passed" or "Failed" column of the return is to be left blank, and a note is to be made on the form to the effect that he is to be re-examined in those subjects. A further return is to be rendered when he has finally passed in all subjects.

137. Training Records

(a) Training records are to be kept by all ships and establishments on Forms S.1308. (In large shore establishments, a suitably tabulated book may be used instead.) These records are to be completed each week.

(b) The front of the form is to include the names of all Communication ratings borne of Leading rate and below. Details of all practical tests carried out are to be shown. The reasons for any non-compliance with paragraph 951 are to be given (e.g. "Sick", "Exercise SEA WEED", etc.). It should be noted that this training applies also to ratings employed on communal duties.

(c) The first tests of each type carried out by a rating on joining are to be underlined in red. If a man joins with a particularly low standard and fails to improve in a reasonable time, the causes are to be investigated and reported to the Administrative Authority, who should, if the circumstances warrant it, forward the report to the Commander-in-Chief.

(d) The back of the form is to show all collective and classroom training carried out onboard during the week.

(e) These records are required in original only, and are to be signed by the Communication Officer weekly. The Captain should see them at monthly intervals. Administrative Authorities and Senior Officers of Squadrons should call for the records from time to time, and they are to be produced at inspections.

(f) Inspecting Officers are to include in their reports remarks on the scale of training carried out on board, and a note of how training records have been kept.

Chapter 2

ENTRY, TRAINING AND ADVANCEMENT OF LONG SERVICE COMMUNICATION RATINGS

Section 1

NEW ENTRY, TRAINING AND ADVANCEMENT TO OPERATOR THIRD CLASS

201. Entry into the Communication Branch

(a) Long service ratings may enter the Navy in any one of the following three age groups:—

- (1) Junior (U) Age 15–16.
- (2) Junior (O) Age 16–17½.
- (3) Adult Age 17½–28.

(b) Junior (U) ratings volunteer for the Seaman/Communication entry, and carry out their preliminary training at H.M.S. *Ganges* or H.M.S. *St. Vincent*. Volunteers for the Communication Branch are selected during the preliminary course, and start training at H.M.S. *Ganges*. After a course at H.M.S. *Ganges* they are drafted to H.M.S. *Mercury* to complete the final 17 weeks of their Part II training. This ensures that both entry streams reach the fleet with a common communications training and standard.

(c) Junior (O) and Adult ratings enter direct into the Communication Branch. Preliminary training is carried out at H.M.S. *Raleigh* and the remainder of the new entry course at H.M.S. *Mercury*.

(d) Further details regarding training in H.M.S. *Ganges*, H.M.S. *Raleigh* and H.M.S. *St. Vincent* are given in the Training Service Regulations (B.R. 697).

202. New Entry Training

(a) The primary aim of the new entry course is to produce a good practical operator who should be able to take his place in the communications department of a ship, and who should, with further practical training afloat, develop into an efficient operator of the watch under normal communication conditions. The time taken to achieve this standard will vary depending on the rating's ability and amount of practical experience given, but should normally be in the region of three months.

(b) Ratings who fail to qualify in the final examination, or who at any time during the course prove to be unsuitable for the Communication Branch, are to be re-categorised or discharged in accordance with current instructions as laid down by the Admiralty.

(c) When ratings fail to make progress they may at the Commanding Officer's discretion be put back into another class, thus giving them a further chance to qualify having regard for their age, the requirements of the service, and the rating's general ability.

(d) Before leaving H.M.S. *Mercury* at the end of their new entry training all ratings are to carry out an aptitude test to assess their capabilities for sub-specialisation at a later date. Results of the aptitude test are to be kept by the Commodore Naval Drafting.

203. Drafting of New Entries

(a) Whenever the drafting situation permits, communication new entries will be drafted to ships additional to complement for six months' sea training.

(b) If a large number of new entry Radio Operators is sent to one ship for training, a suitable Communication Yeoman and/or Radio Supervisor may be drafted additional for instructional purposes (*Naval Drafting Regulations*, B.R. 14, Article 0405 refers).

204. Instruction of New Entries Awaiting Draft

- (a) Arrangements must be made for any new entries awaiting draft, however short the period, to be given continuation training.
- (b) If there is likely to be an appreciable period before a rating goes on draft, a proper continuation syllabus of instruction should be arranged covering subjects not taught in new entry training, but which will be required in the examination for Radio Operator Second Class.
- (c) Similar arrangements must be made for any new entry communication ratings making a long sea passage to join their first ship.

205. Professional Training at Sea

- (a) The transition from new entry training conditions to life and work at sea is abrupt and often unsettling. It is therefore important that, on joining their first ship, new entry communication ratings are given every encouragement and opportunity to consolidate and develop their practical ability.
- (b) A daily practical exercise and at least four hours watchkeeping per day should be the minimum target to ensure reasonable progress.
- (c) An important part of this continuation training is to introduce a rating to the full scope of the work of the Communication Branch. Any tendency to leave him in one sub-department only must be avoided even though he may show special aptitude for one particular type of operating.
- (d) Once a rating has settled down and shown himself a reasonable operator, arrangements should be made whenever possible, for continuation training to bring the rating up to the standards required for the Radio Operator Second Class examination. Ratings must realise, however, that although special instruction and courses can often be arranged before taking the examination there is seldom time to cover the whole field of knowledge required, and it is essential to put in a considerable amount of personal study to ensure passing at the first attempt. Commanding Officers of ships smaller than frigates should see that third class and junior rates are given every opportunity to experience and study the full range of subjects for second class rate. This should include procedures and equipment experience of which the rating is unable to gain in his own ship.

206. School Training at Sea

To have passed E.T.L.R. is a necessary qualification for advancement to Leading rate and above. It is therefore very desirable that ratings should pass this examination as early as possible as instruction in later years may not be readily available. Junior ratings must be encouraged to make use of School facilities at sea and are to attend day-time instruction in depot schools and education centres whenever they can be spared.

207. Reports from Sea

A form will be enclosed in service documents of all new entry ratings when drafted from H.M.S. *Mercury* to their first sea-going ship. Divisional officers are required to report on this form five months after the rating joins the ship.

208. Advancement to Radio Operator 3rd Class

Junior Radio Operators are advanced to Radio Operator Third Class on reaching the age of $17\frac{1}{2}$. Juniors (U) are not, however, advanced while still under training. In such cases they are advanced on leaving the training establishment, and their seniority is then backdated to $17\frac{1}{2}$.

209-220. Spare

Section 2

TRAINING AND ADVANCEMENT FOR HIGHER RATE

221. General Advancement Principles and Table of Minimum Qualifications

(a) The detailed regulations for advancement are laid down in the following publications:—

- (1) Long service ratings B.R. 1066.
- (2) Reserve ratings B.R. 60.
- (3) W.R.N.S. B.R. 1077.

(b) The information contained in this publication is intended as a guide only, and the relevant advancement regulations must be consulted in cases where a rating's actual advancement is concerned.

(c) This section outlines the various methods by which long service communication ratings may qualify for advancement. A summary of the various qualifications required for advancement is given in the following table:—

MINIMUM QUALIFICATIONS NECESSARY FOR ADVANCEMENT

ADVANCEMENT TO:—	SENIORITY IN PRESENT RATE	SEAGOING SERVICE	EDUCATIONAL EXAMINATION	PROFESSIONAL EXAMINATION	V.G. CONDUCT
Radio Operator 2nd Class	Juniors (U) 12 ¹⁵ months Others 15 ¹⁸ months (See Note (ii))	Nil	Nil	Examination at sea	Nil
Radio Operator 2nd Class (T), (G) or (W)	Nil	Nil	Nil	Examination after course at H.M.S. <i>Mercury</i> or S.T.C.	Nil
Leading Radio Operator (T), (G) or (W)	18 months since being rated R.O.2	6 months since 17½	E.T.L.R.	Examination by Fleet Board	6 months
Petty Officer rate	1 year including acting time	6 months as Leading rate or 12 months since 17½	E.T.L.R.	Final examination after course at H.M.S. <i>Mercury</i> Provisional examination	6 months
Chief Petty Officer rate	3 years including acting time	6 months as Petty Officer or 2 years since 17½	E.T.L.R.	Must have passed the final examination for Petty Officer rate	6 months

Notes:

- (i) *Seagoing service* is defined as “service in a ship or tender which regularly puts to sea, or employment on flying duties”.
- (ii) On advancement to Radio Operator 2nd Class, up to six months additional seniority may be awarded by ante-dating based on:—
 - (a) Results obtained during new entry training.
 - (b) Results obtained in Educational Test at H.M.S. *Ganges*.
 - (c) Ability shown during service since completion of new entry training (see B.R. 1066, Part III).
- (iii) Ex R.N.R. ratings may count half of their service in the R.N.R. towards the time qualification for advancement in the Royal Navy.

222. Examination for Radio Operator 2nd Class

(a) The professional examination for Radio Operator 2nd Class may be taken at any time after advancement to Radio Operator 3rd Class, provided Part II new entry training has been successfully completed. Applications for examination are to be forwarded on Form S.442 to the Administrative Authority, who will arrange for the examination to be held locally. Details of the application (the date of which is the basic date of passing if successful), are also to be recorded in the appropriate section of the rating's history sheets (S.1246).

(b) The names of ratings who exceed the time service qualification without having been examined for Radio Operator 2nd Class are to be reported to the Administrative Authority giving the reason for non-examination.

(c) The examination is to be conducted by a qualified Communication Officer (General or Special Duties List). The subjects and passing percentages required are laid down in Section 3 of Chapter 2. In framing their questions, examiners must take into account the candidate's experience and the type of ship in which he has served. The standard of knowledge tables should be used purely as a general guide.

(d) A rating who fails the examination may not apply to be re-examined until one month from the date of failure.

(e) The names of Radio Operators 3rd Class who do not pass for 2nd Class within a reasonable period are to be reported to the Admiralty so that further retention in the service can be considered. Such reports should not be delayed beyond the completion of three years as Radio Operator 3rd Class (B.R. 1066, Article 0105(2)).

223. Advancement to Radio Operator 2nd Class

(a) Radio Operators 3rd Class who have passed the professional examination for 2nd Class may be advanced to the latter rate after a minimum period of **12** months in the former rate in the case of ex-Juniors (U), and **15** months in the case of all other entries.

(b) Their seniority as Radio Operators 2nd Class may be ante-dated up to six months based on:—

- | | |
|--|-------------------------|
| (1) Results achieved in passing out examinations on completion of new entry training | } (up to three months). |
| (2) Educational Test at H.M.S. <i>Ganges</i> | |
| (3) Ability shown during service since completion of new entry training | |

224. Choice of Sub-Specialisation

(a) Commanding Officers are to arrange for Form S.1328* (Choice of Sub-Specialisation in the Communication Branch) to be rendered in duplicate to the Commodore Naval Drafting immediately an R.O.3 passes for the Able rate. The Commodore Naval Drafting will complete Part II of the form and return one copy to the rating's ship or establishment for the information of the rating concerned, and forward one copy to the Captain, H.M.S. *Mercury*.

(b) Until Form S.1328 is generally distributed these returns are to be rendered in type-script in accordance with the proforma shown in Appendix 1.

(c) Selection for any particular sub-specialisation course will depend on:—

- (1) Service requirements in each sub-specialisation.
- (2) Rating's choice as expressed on Form S.1328.
- (3) Suitability for sub-specialisation selected.

* Specimen shown at Appendix 1.

225. Sub-Specialisation Courses

(a) At the first convenient opportunity after being rated R.O.2 ratings will undergo a sub-specialisation course for Radio Operator 2nd Class (T), (G) or (W). These courses are held at H.M.S. *Mercury* for ratings serving on Port Service, Home Sea Service or returning from oversea service, and at Signal Training Centre Malta and Singapore for ratings serving on the Mediterranean or Far East Stations either ashore or afloat. In the former case ratings will be drafted to H.M.S. *Mercury* when the situation permits. In the latter case Commanding Officers are to apply to Commanders-in-Chief for courses when ratings can be spared. It may not always be possible to arrange reliefs for men serving abroad. Ratings unable to be spared for courses abroad will have to await their return to U.K. before being drafted for course.

(b) Ratings who fail to make progress in their sub-specialisation course due to sickness or absence or who fail to qualify in the final examination may, at the Commanding Officer's discretion, be put back into another class thus giving them a further chance to qualify.

(c) Under exceptional circumstances ratings who fail, or show no aptitude for the sub-specialisation course for which they have been selected, may, subject to the concurrence of the Naval Drafting Authority, be transferred to one of the other sub-specialisation courses provided the following conditions have been satisfied:—

- (1) Every effort, including back classing and extra instruction out of working hours, has been made to qualify the rating in the sub-specialisation for which he was selected.
- (2) The Captain, H.M.S. *Mercury*, or Officer-in-Charge of the S.T.C. concerned considers that the rating is in all other respects suitable for retention in the Service.
- (3) The Captain, H.M.S. *Mercury*, or Officer-in-Charge of the S.T.C. concerned is satisfied that the rating has a reasonable chance of qualifying in the sub-specialisation to which he is being transferred.

(d) Names of ratings who fail their sub-specialisation course and are not qualified for back classing or transfer under the terms of sub-paragraphs (b) and (c) above are to be reported to Admiralty with a view to:—

- (1) Undergoing a further period at sea of not less than six months as R.O.2 before being drafted for another attempt at the sub-specialisation course for which they were originally selected, or
- (2) Recategorisation into a Branch other than the Communication Branch, or
- (3) Discharge from Naval Service.

(e) Ratings who passed the Leading rate examination before undertaking the sub-specialisation course (see paragraph 226 (a) below) will be considered to have qualified in their sub-specialisation rate and will not be drafted for sub-specialisation courses.

226. Examination for Leading Rate

(a) Ratings who are recommended for Leading Radio Operator may apply to be examined for the appropriate Leading rate any time after being rated R.O.2. Applications are not normally to be entertained until after the sub-specialisation course has been completed but ratings showing exceptional ability may be recommended before taking this course. In this event special facilities should be afforded to likely candidates to study for the examination which will entail considerable effort on the part of ratings concerned.

(b) Application for examination should be forwarded to Commanders-in-Chief, Flag Officer Scotland and Northern Ireland, Flag Officer Middle East and Flag Officer Aircraft Carriers as appropriate (through Administrative Authorities) on form S.442 with a copy to C.N.D. Before forwarding an application the Commanding Officer should satisfy himself that the candidate has made adequate preparation, stands a reasonable chance of passing the examination and, given experience, would make a good Leading Hand. In the case of (G) or (W) candidates applications are to be accompanied by a list of equipment that the Commanding Officer considers the applicant has had sufficient opportunity to study. (See paragraph 237(e)).

(c) Examination will be by Fleet Boards convened by Commanders-in-Chief and Flag Officers listed in (b) above at least three times a year. The President of the Board is to be either a qualified Communication Officer (General List or Special Duties) of not less than Lieutenant-Commander rank or the officer-in-charge of a Signal Training Centre. Commanders-in-Chief, Flag Officers, Administrative Authorities and Commanding Officers are to make every effort to ensure that all ratings eligible and recommended for examination are made available at the time and place selected for the Fleet Board.

(d) Officers conducting the examination should be guided by the Standards of Knowledge given in Chapter 2, Section 3 of this publication.

(e) The oral examinations are to be based on local station communication orders and in the case of (G) and (W) ratings on the radio equipment in the rating's own ship, due regard being paid to the candidate's past and present employment.

(f) The paper examinations are to be set and corrected locally. Specimen papers will be forwarded by H.M.S. *Mercury* to Commanders-in-Chief and S.T.C.s once a term.

(g) Ratings who fail in not more than two subjects may apply to be re-examined in these subjects only, at the next Fleet Board. If, however, they are not available at the time of the next Board, they may be re-examined at a Signal Training Centre or by a qualified (C) Officer, between two and six months after the original Board. Ratings who fail in more than two subjects are considered to have failed the examination and may apply to take the examination again after a minimum period of six months from the date of first or any subsequent failure. Failure to pass the re-examination in one or two subjects at the next Fleet Board is to be treated as failure to pass the examination. Ratings who decline to appear before a Fleet Board are to be considered as having failed the examination and may apply to take the examination again after a minimum period of six months from the date of the Board. Commanding Officers may, however, exempt from this penalty men who decline the Board for adequate private reasons.

(h) The basic date for successful candidates will be the date of application for examination on form S.442 and this should be recorded on page 3 of Service Certificates, History Sheets and forms S.1124. Ratings who are successful at the re-examination allowed under sub-paragraph (g) above are to have their basic dates adjusted to two months later than that obtained if they had passed the full examination in the first place.

(i) Ratings who have passed the examination will be entitled to Scale "A" pay under B.R. 1950 (*Naval Pay Regulations*), Article 503(2).

227. Recommendations to Qualify Professionally for Petty Officer and Instructor Rates

Principles of Recommendation for Advancements

(a) The aim of these advancement courses is to qualify men *professionally* for higher rate. Before forwarding a recommendation, a Commanding Officer must satisfy himself as follows:—

(1) The man must show that he possesses qualities which, with further experience if necessary, will fit him for the rate for which he is recommended. Such qualities include character and personality, and the test to apply is whether the Commanding Officer would wish to have the man in the acting higher rate in his own ship, with further experience if necessary.

(2) A man must show by his practical ability and application, by his ability to learn and his willingness to prepare himself for the course, that he has a good chance of passing.

(b) The above provisions apply not only at the time of being recommended, but at all times subsequently before being put on course. If a man recommended for course falls below the desired standards of efficiency and promise described in sub-paragraph (a) above, either in the ship or establishment from which he is initially recommended or in any subsequent ship or establishment, his recommendation must be cancelled. Thus all men with outstanding recommendations must be the subject of continual review. *See also* paragraph 233 (d).

Procedure for Recommendation for Advancement

(c) Recommendations to qualify professionally for Petty Officer and Instructor rates are to be forwarded to the Captain, H.M.S. *Mercury*, through Administrative Authorities on form S.1303A in duplicate as soon as a man applies, is eligible and is recommended.

(d) Forms S.1303A for Petty Officer rate may be forwarded at any time after advancement to Acting Leading rate, provided the Commanding Officer has satisfied himself that the rating possesses the qualities, which, with further experience, if necessary, will fit him to make an efficient Petty Officer.

(e) Forms S.1303A for Instructor rates may be forwarded as soon as a rating volunteers and is recommended, but are limited to the following:—

(1) Chief Petty Officer ratings.

(2) Petty Officer ratings.

(3) Leading ratings of at least four years' seniority who have passed the course and examination for Petty Officer rating.

(f) Ratings who are "highly" recommended are given preference when drafting ratings to courses, and such recommendations should therefore be awarded with great discrimination and limited to outstanding ratings.

(g) Should a rating be ineligible for any reason, or considered unsuitable, form S.1303A will be returned with an appropriate explanation.

(h) Should a rating who has been recommended to qualify for higher rate fall below the desired standard of efficiency and promise, his recommendation should be cancelled; the Captain, H.M.S. *Mercury* and C.N.D. should be informed, and an appropriate notation made on the rating's History Sheet.

228. Basic Dates

(a) Basic Dates are to be calculated as follows:—

(1) For R.O.2.—As indicated in paragraph 223.

(2) For R.O.2 (T), (G) or (W).—The date of passing the appropriate sub-specialisation course. In the case of R.O.2s who pass for Leading rate before taking the sub-specialisation course, it will be the date of application for examination for Leading rate.

(3) For Leading rates.—The date of application for examination (if successful) on form S.442. See also paragraph 226 (h).

(4) For Petty Officer and Instructor rates.—The date of application for course (if successful) on form S.1303A.

(b) In (a) (3) and (4) above, this date is the date on which the man presents his request to his Commanding Officer to be recommended for examination or course (i.e. the date of his request form). The form S.442 or S.1303A and the entry in the man's History Sheet must also bear the same date. It is the duty of the Communications Divisional Officer to ensure the above procedure is implemented.

229. Selection for Courses for Petty Officer Rate

The names of ratings recommended to qualify for Petty Officer rate will be forwarded by the Captain, H.M.S. *Mercury*, to the Commodore Naval Drafting, who will roster them according to their category, each category being arranged in the order of date of recommendation. So far as drafting will permit, ratings in category "A" will be selected for a course before those in category "B" et seq. Categories are as follows:—

"A." Ratings who have been recommended for S.D. List.

"B." Ratings "highly" recommended.

"C." Ratings who have passed the provisional examination but are not "highly" recommended.

"D." All others.

230. Selection for Course for Instructor Qualifications

(a) The selection of ratings for the Instructor rates course is carried out by the Captain, H.M.S. *Mercury* from those ratings who have been recommended on form S.1303A. The following factors are taken into consideration when making the selections.

- (1) "High" recommendations.
 - (2) Assessments of efficiency over the preceding five years.
 - (3) Results obtained in the principal subjects of their examinations for R.S., R.S. (W), or C.Y.
 - (4) Educational qualifications held (*i.e.* H.E.T.).
- (b) The Captain, H.M.S. *Mercury* will inform Commodore Naval Drafting of the names of ratings selected in sufficient time for them to be made available for the course.

231. Service Qualification for Taking Advancement Courses

No man may undergo an advancement course if he had less than two years of his current engagement to serve on the day the course ends.

232. Refusal to Take a Petty Officer or Instructor Rate Course

(a) Ratings who decline to undergo a course for which they have volunteered and have been recommended are, after being warned of the effect of such a refusal, to be removed from the roster and may not be recommended again on form S.1303A for one year.

(b) Commanding Officers may, however, exempt from this penalty men who decline the course for adequate private reasons.

(c) The Captain, H.M.S. *Mercury*, and C.N.D. are to be informed accordingly.

233. Advancement Rosters and Half-yearly Recommendations for Advancement

(a) Ratings who are recommended and are fully qualified for the next higher rate are placed on the appropriate advancement roster by Commodore Naval Drafting according to the number of points they have obtained.

(b) Points are awarded as follows:—

- (1) Basic Points. One point for each month or part of month for the period between the rating's basic date and the date of the latest form S.507 on which his name appears. This basic date is the date on which he was recommended to qualify professionally for higher rate as shown on form S.442 (Leading rate) or S.1303A (Petty Officer rate).
 - (2) Merit Points. Awarded by Commanding Officers to ratings who are eligible on 31st May and 30th November on form S.507. The points that may be awarded are eight, six, four, two or nought. No other numbers are used. The award of eight points is restricted to 20 per cent. of the total numbers reported on form S.507.
 - (3) Dormant Merit Points. These are awarded, as for merit points on the back of form S.507, to ratings who have been recommended for examination on form S.442, or for advancement course by form S.1303A, but have not yet completed the appropriate examination or course. These points are credited to ratings when they become fully qualified to be placed on the roster.
- (c) Should a rating be not recommended, *i.e.* awarded nought merit points on form S.507, his name is removed from the roster, but when he is again recommended it is placed in accordance with his original points total, adjusted by the number of accumulated basic points plus the merit points awarded in the latest recommendation.
- (d) Before awarding a rating nought dormant merit points (*see* sub-paragraph (b) (3) above), for obvious reasons, consideration should be given to cancelling his recommendation on form S.442 or S.1303A. Should, however, it be decided that notwithstanding such an award the recommendation should stand, a note to this effect should be added on form S.507. In the absence of such a notification, it will be assumed that the award cancels the recommendation and in the case of forms S.1303A, these will be automatically cancelled. The recommendation noted on the rating's History Sheet should be cancelled by the ship at the same time.
- (e) Full details of the roster system are contained in B.R. 1066 and current A.F.Os.

234. Advancement in Rate

(a) When a rating has reached the top of his particular roster and is due for advancement, the Commodore Naval Drafting will forward form B.13 to his Commanding Officer. It is then the Commanding Officer's responsibility to take action as follows:—

- (1) If the rating is considered fit for advancement, he may grant him the Acting Leading, Acting Petty Officer, or Chief Petty Officer rate as the case may be, and return the completed form B.13 to the Commodore Naval Drafting.
- (2) If there is any doubt whether the rating concerned is suitable for advancement, the decision may be postponed for a period not exceeding two months. If it should then be decided that the rating is fit for advancement, the postponement of the decision is not to affect the date of advancement, which is to be the date shown on the form B.13.
- (3) If the rating is not considered fit to be advanced, form B.13 is to be returned to the Commodore Naval Drafting. In such a case the man will not be replaced on the roster until he is subsequently recommended on form S.507.

(b) After serving one year in the Acting rate, and if recommended, he is confirmed in the rate. Ratings advanced to Petty Officer on provisional qualifications may not be confirmed until they have, in addition, passed the qualifying course and examination.

235. Advancement to Petty Officer Rate (Provisional Method)

(a) Ratings who have been recommended on form S.1303A, may apply to be examined provisionally at any time. Application should be forwarded to Commanders-in-Chief (through appropriate Administrative Authorities) on form S.442. Before forwarding an application, the Commanding Officer should satisfy himself that the candidate has made adequate preparation and stands a reasonable chance of passing the examination. In the case of Leading Radio Operator (G) and (W) ratings, applications are to be accompanied by a list of equipment that the Commanding Officer considers the applicant has had sufficient opportunity to study.

(b) Officers conducting provisional examinations should be guided by the standards of knowledge given in Chapter 2, Section 3.

(c) The oral examinations are to be based on local station communication orders, and in the case of Leading Radio Operator (G) and (W) ratings, on the radio communication equipment, in the rating's own ship, due regard being paid to the candidate's past and present employment.

(d) The paper examinations are to be set and corrected locally. Specimen papers (not including cryptography) will be forwarded by H.M.S. *Mercury* to Commanders-in-Chief and S.T.C.s once a term.

(e) The basic date for successful candidates will be the date of recommendation on form S.1303A, and this date should be recorded on page 3 of service certificates, history sheets and forms S.1124 or S.1124A.

(f) Ratings who fail the provisional examination, may apply to be re-examined after a period of six months from the date of failure. If they fail at the second attempt, they must then await normal selection for an advancement course. In exceptional circumstances the examining officer may recommend a third attempt after a further interval of six months.

(g) Failure at a provisional examination does not affect a man's basic date.

(h) Ratings who have passed the provisional examination, and also hold the necessary non-professional qualifications (service, E.T.L.R., etc.) are to be shown on form S.507 (half-yearly recommendations for advancement) in the same way as ratings who have passed the full advancement course.

(i) The Commodore Naval Drafting will issue form B.13 in the usual way when a man comes to the top of the advancement roster and a vacancy exists. Advancement will then be to the Acting rate for a minimum period of 12 months, and until they pass the final examination.

(j) Failure at the advancement course entails the forfeiture of the basic date and, if the higher rate is held, reversion. The normal rules for re-recommendation on form S.1303A will apply.

(k) Refusal to take the advancement course, after warning of its effect on advancement, entails forfeiture of the basic rate and, if the higher rate is held, reversion. Such refusal is to be recorded on the man's history sheet, and he may not be recommended again on form S.1303A for one year. Commanding Officers may, however, exempt from these penalties men who decline a course for adequate private reasons, the Commodore Naval Drafting and the Captain, H.M.S. *Mercury*, being informed accordingly.

236. Guidance for Advancement Examinations and Instructions for Higher Rate at Sea

(a) Commanding Officers should give every assistance to candidates for advancement, and should arrange suitable training programmes taking into account ship's movements and the dates of Fleet Board examinations.

(b) Success will depend almost entirely on the following three factors and failure will result if any one of them is missing:—

- (1) Stimulation of personal effort in spite of limited leisure.
- (2) Sustained supervision and continuous follow up by a Communication Officer.
- (3) Provision of a suitable space for study.

(c) For ratings preparing themselves for Leading Radio Operator (G) and (W) theory notes can be made available on application to the Captain, H.M.S. *Mercury*. B.R. 483 (Foundations of Wireless) which is a suitable textbook should also be obtained.

237. Conduct of Fleet Boards

(a) The following practical examinations may, at the discretion of the convening authority, be taken within a period of four months, prior to the date of the Fleet Board:—

Flashing Reception	..	..	..	FRX
Flashing Transmission	..	..	..	FTX
Semaphore Reception	..	..	..	SRX
Semaphore Transmission	..	..	..	STX
Morse Manuscript Reception	..	..	..	MMX
Morse Transmission	..	..	..	MTX
Morse Special Reception	..	..	..	MSX
Teletyping	..	..	..	TTX
or basic Keyboard Exercise	..	..	..	BKX when TTX facility are not available
Radar Recognition	..	..	..	RRX

(b) The practical examinations in (a) above appropriate to the rate for which the candidate is qualifying may be conducted by any qualified communication officer and are to be taken within a period not exceeding one week.

(c) Books containing lists of questions for use by Examining Officers in compiling written question papers and for use by candidates in preparing for Fleet Boards are held by Administrative Authorities.

(d) Details of administrative arrangements for the conduct of Fleet Boards are contained in local orders.

(e) Forms S.442 when raised, except for the copy to CND, are to be retained with a man's Service Documents until the details of a particular Board have been promulgated when they are to be rendered as directed in the convening message.

238–250. Spare.

**EXAMINATIONS AND STANDARDS OF KNOWLEDGE OF
LONG SERVICE COMMUNICATION RATINGS**

251. Introduction

(a) This section contains details of passing percentages and standards of knowledge tables in the following subjects:—

- General Communication Instructions.
- Fleetwork.
- Miscellaneous.
- Radio Communication Organisation.
- Radio Communication Equipment (Technical).
- Radio Communication Equipment (Theory).
- W/T Procedure.
- V.S. Procedure.
- Voice Operating.
- A.T. Procedure.
- Electronic Warfare Principles and Organisation.
- Electronic Warfare Procedure.
- Electronic Warfare Technical.

(b) Standards of knowledge tables for cryptography are contained in the Cryptographic Operating Instructions.

(c) Standards of knowledge for provisional examinations are the same as for the appropriate rate. Passing percentages are however lower in some subjects as shown in Table 252.

252. Passing Percentages

	J.R.O./ R.O.3	R.O.2	R.O.2 (T)	R.O.2 (G)	R.O.2 (W)	L.R.O. (T)	L.R.O. (G)	L.R.O. (W)	C.Y. (PROV.)	C.Y.	R.S. (PROV.)	R.S.	R.S. (W) (PROV.)	R.S. (W)	T.C.I.	R.C.I.	E.W.I.	
Fleetwork	70	75*	80	—	—	80	—	—	75*	80	—	—	—	—	80(f)	—	—	
G.C.I.	70	75*	80	80	80	80	80	80	75*	80	75*	80	75*	80	80	80	80	
Miscellaneous			80	—	—	80	—	—		80	—	—	—	—	80(f)	—	—	
Radio communication organisation	75	75*	75	80	75	—	80	80	—	—	75*	80	75*	80	—	80(f)	80(f)	
A.T. procedure paper	75	—	80	80	80	80	80	80(e)	75*(d)	80	75*(b)	80	75*(b)(e)	80	80	80	80	
A.T. procedure practical	—	80	80	80	80	80	80	80(e)	80	80	80	80	80(e)	80(e)	80	80	80(e)	
V.S. procedure paper	75	—	80	—	—	80	—	—	75*(d)	80	—	—	—	—	80	—	—	
V.S. procedure practical	75	80	80	—	—	80	—	—	80	80	—	—	—	—	80	—	—	
Voice operating practical	80	85	85	85	85	85	85	85	90	90	90	90	90	90	95	95	95	
R.C.E. technical paper	—	—	—	75	75	—	—	—	—	—	—	80	—	80	—	80(f)	80	
R.C.E. theory paper	60	—	—	60	60	—	—	—	—	—	—	60	—	60	—	65	65	
R.C.E. technical practical	75	75	—	70	70	—	70	70	—	—	75(c)	75	75(c)	75	—	80	80	
Cryptography	80	80	80	80	80	80	80	80	75*	80	75*	80	75*	80	80(f)	80(f)	80	
F.W. trainer practical	—	—	—	—	—	—	—	—	—	80	—	—	—	—	85	—	—	
W/T procedure paper	75	—	75	80	75	75	80	75	—	—	75*(b)	80	75*(b)	80	—	80	80	
W/T procedure practical	75	80	75	80	75		80	75	—	—	80	80	80	80	—	80	80	
E.W. organisation paper	—	75*	—	75*	75	75*	80	—	—	—	—	—	70*	80	—	—	80(f)	
E.W. technical paper	—		—		70		—	—	—	—	—	—	—	75	—	—	80(f)	
E.W. technical practical	70		—		75		—	75	—	—	—	—	—	80	80	—	—	80
E.W. procedure practical			—		75		85	—	85	—	—	—	—	85	85	—	—	85
Flashing reception—F.R.X. ..	10/94	10/96	10/96	10/96	10/96	10/96	10/96	10/96	10/96	10/96	10/96	10/96	10/96	10/96	10/96	10/96	10/96	
Flashing transmission—F.T.X. ..	10/80	10/90	10/90	10/90	10/90	10/90	10/90	10/90	10/90	10/90	10/90	10/90	10/90	10/90	10/90	10/90	10/90	
Semaphore reception—S.R.X. ..	—	—	8/96	—	—	8/96	—	—	8/96	8/96	—	—	—	—	8/96	—	—	
Semaphore transmission—S.T.X. .	—	—	8/90	—	—	8/90	—	—	8/90	8/90	—	—	—	—	8/90	—	—	
Morse manuscript Rx.—M.M.X. .	18/94	18/96	18/96	22/96	18/96	18/96	22/96	18/96	18/96	18/96	22/96	22/96	18/96	18/96	18/96	22/96	18/96	
Morse transmission—M.T.X. ..	15/80	18/90	18/90	20/90	18/90	18/90	20/90	18/90	18/90	18/90	20/90	20/90	18/90	18/90	18/90	20/90	18/90	
Morse special Rx.—M.S.X. ..	—	—	—	22/98	18/98	—	22/98	18/98	—	—	22/98	22/98	18/98	18/98	—	22/98	18/98	
Basic keyboard operating—B.K.X.	30/94	30/96	30/96	30/96	30/96	40/96	40/96	40/96(e)	40/96	40/96	40/96	40/96	40/96(e)	40/96(e)	40/96	40/96	40/96(e)	
Teletyping—T.T.X.	30/94	30/96	30/96	30/96	30/96	40/96	40/96	40/96(e)	40/96	40/96	40/96	40/96	40/96(e)	40/96(e)	40/96	40/96	40/96(e)	
Typing layout—T.L.X.	94	94	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Radar recognition—R.R.X. ..	—	—	—	—	70	—	—	75	—	—	—	—	75	75	—	—	80	

Notes
 * These examinations are to be oral and not written.
 Cryptography to include practical.
 (a) The B.K.X. is only included in examinations for sub-specialist courses and above when T.T.X. facilities are not available.
 (b) A.T. and W/T procedure is to be a combined oral examination for R.S. (Prov.) and R.S. (W) (Prov.).
 (c) Examination only on equipment fitted in candidate's ship.
 (d) A.T. and V.S. procedure is to be a combined oral examination for C.Y. (Prov.).
 (e) Ratings who qualified R.O. (S) before 12th January, 1963, are not to be examined in this subject.
 (f) Includes ability to instruct in this subject.

255. General communication instructions

Standards

- A Thorough knowledge and ability to look up the references quickly.
- B Good knowledge and general idea of where references are to be found.
- C Knowledge of principles only. General idea of in what books information is contained.

SUBJECT	R.O.2 (T)	L.R.O. (T) (FLEET BOARD)	L.R.O. (T)	C.Y. (PROV.)	C.Y.	T.C.I.	R.O.2 (G)	L.R.O. (G) (FLEET BOARD)	L.R.O. (G)	R.S. (PROV.)	R.S.	R.C.I.	R.O.(W).2	L.R.O. (W) (FLEET BOARD)	L.R.O. (W)	R.S. (W) (PROV.)	R.S. (W)	E.W.I.
PRINCIPLES OF NAVAL COMMUNICATIONS																		
Instructions on reticence and responsibility of communication personnel.	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Standard phraseology and phonetic alphabet	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Means of communication	B	A	A	A	A	A	B	A	A	A	A	A	B	A	A	A	A	A
Use of precedences	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Plaindress and Codress	A	A	A	A	A	A	A	A	A	A	A	A	B	A	A	A	A	A
COMMUNICATION SECURITY																		
Physical, transmission and cryptographic security—their inter-relationship.	B	B	A	A	A	A	C	B	A	A	A	A	C	B	A	A	A	A
Security of landlines	B	B	A	A	A	A	B	B	A	A	A	A	B	B	A	A	A	A
Transmission security	C	B	A	A	A	A	C	B	A	A	A	A	C	B	A	A	A	A
Physical security {included in Crypto instructions (See Crypto-Crypto security {graphic operating Instructions)																		
MESSAGE ORIGATION																		
Originators responsibilities	B	A	A	A	A	A	B	A	A	A	A	A	B	A	A	A	A	A
Security classification	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Drafting the text	C	B	A	A	A	A	C	B	A	A	A	A	C	B	A	A	A	A
Use of special prefixes and message instructions	B	A	A	A	A	A	B	A	A	A	A	A	B	A	A	A	A	A
MINIMIZE	C	B	A	A	A	A	C	B	A	A	A	A	C	B	A	A	A	A
Use of codeword CLEAR	—	C	B	A	A	A	—	C	B	A	A	A	—	C	B	A	A	A
ROUTEING AND PREPARING MESSAGES FOR DESPATCH																		
Naval messages	B	A	A	A	A	A	B	A	A	A	A	A	B	B	B	B	B	B
Commercial messages	C	B	A	A	A	A	C	B	A	A	A	A	C	B	B	B	B	B
Use of routeing directory	C	B	A	A	A	A	C	B	A	A	A	A	C	B	B	B	B	B
Hand messages	B	A	A	A	A	A	B	A	A	A	A	A	B	B	B	B	B	B
Airgrams and postgrams	B	A	A	A	A	A	B	A	A	A	A	A	B	B	B	B	B	B

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255. General communication instructions—*continued*

SUBJECT										R.O.2 (T)	L.R.O. (T) (FLEET BOARD)
MESSAGE HANDLING IN SHIPS											
Layout of offices	..	..	..	..	..	..	..	..	..	B	A
OUT messages	..	..	..	..	..	..	..	..	..	B	A
IN messages	..	..	..	..	..	..	..	..	..	B	A
THROUGH messages	..	..	..	..	..	..	..	..	..	B	A
Distribution systems	..	..	..	..	..	..	..	..	..	B	A
Files, checks and records	..	..	..	..	..	..	..	..	..	B	A
MESSAGE HANDLING ASHORE											
Layout of offices	..	..	..	..	..	..	..	..	..	—	—
OUT messages	..	..	..	..	..	..	..	..	..	—	—
IN messages	..	..	..	..	..	..	..	..	..	—	—
THROUGH messages	..	..	..	..	..	..	..	..	..	—	—
Distribution systems	..	..	..	..	..	..	..	..	..	—	—
Files, checks and records	..	..	..	..	..	..	..	..	..	—	—
Special arrangements at large headquarters and shore wireless stations.										—	—
Hand message organisation at a base	..	..	..	..	..	..	..	..	..	C	C
Basegrams	..	..	..	..	..	..	..	..	..	C	C
GENERAL MESSAGES											
Definitions	..	..	..	..	..	..	..	..	..	C	B
Admiralty general messages	..	..	..	..	..	..	..	..	..	C	B
Station, squadron and local general messages	..	..	..	..	..	..	..	..	..	C	B
Navigational general messages—peace	..	..	..	..	..	..	..	..	..	C	B
Navigational general messages—war	..	..	..	..	..	..	..	..	..	—	—
Address indicating groups	..	..	..	..	..	..	..	..	..	B	A
Allied general messages	..	..	..	..	..	..	..	..	..	—	—
RADIO TELEGRAMS											
Types of commercial radio telegrams	..	..	..	..	..	..	..	..	..	C	B
Private messages between H.M. ships	..	..	..	..	..	..	..	..	..	C	B
Routeing and delivery	..	..	..	..	..	..	..	..	..	—	C
Accounting	..	..	..	..	..	..	..	..	..	—	C

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L.R.O. (T)	A A A A A A	C C C C C C C	B B	A A A B C A C	B B C C
C.Y. (PROV.)	A A A A A A	C C C C C C C	B B	A A A B C A C	B B C C
C.Y.	A A A A A A	B B B B B B B	B B	A A A A B A B	B B B C
T.C.I.	A A A A A A	A A A A A A A	A A	A A A A B A B	B B B C
R.O.2 (G)	B B B B B B	— — — — — —	C C	C C C C — B	C C — —
L.R.O. (G) (FLEET BOARD)	A A A A A A	— — — — — —	C C	B B B B — A	B B B C
L.R.O. (G)	A A A A A A	C C C C C C C	B B	A A A B C A C	A A A B
R.S. (PROV.)	A A A A A A	C C C C C C C	B B	A A A B C A C	A A A B
R.S.	A A A A A A	B B B B B B B	B B	A A A A B A B	A A A B
R.C.I.	A A A A A A	A A A A A A A	A A	A A A A B A B	A A A B
R.O.(W).2	B C C C C C C	— — — — — — —	— —	C C C C — B	C C — —
L.R.O. (W) (FLEET BOARD)	B C C C C C C	— — — — — — —	C C	B B B B — B	C C — —
L.R.O. (W)	B C C C C C C	— — — — — — —	C C	B B B B C B	C C — —
R.S. (W) (PROV.)	B C C C C C C	— — — — — — —	C C	B B B B C B	C C — —
R.S. (W)	B C C C C C C	— — — — — — —	C C	B B B B C B	C C — —
E.W.I.	B C C C C C C	— — — — — — —	C C	B B B B C B	C C — —

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LOGREQ messages ..	..	..	..	..	..	..
RAINBOW messages ..	..	..	..	..	..	..
Movement reporting messages ..	..	..	..	..	..	..
Naval control of shipping messages ..	..	..	..	..	..	..

Relationships of communication and tactical publications	..					
Station communication orders	..	..	..	..	..	..
Operation orders	..	..	..	..	..	..
Ships' communication orders	..	..	..	..	..	..
A.F.O. 'S' series	..	..	..	..	..	..
Corrections to publications. How promulgated. Responsibility for inserting.						

R.N. Command Structure—
Admiralty, Commanders-in-Chief, and Flag Officers ..
Organisation of the Admiralty and Whitehall M.S.O. ..
Allied Command structure—
CAN/UK/US, NATO and SEATO ..
British Joint Services Staff Structure—Chiefs of Staff, ..
B.J.C.E.B. ..

[illegible]

256. Fleetwork*Standards*

- A* A complete knowledge of the subject. Every detail must be known and thoroughly understood (*e.g.*, knowledge required instantly without reference to any book).
- A A complete understanding of the subject. The exact details need not be known by heart (*e.g.*, the type of manoeuvre which should be fully understood but for which reference to the books to check details would normally be expected).
- B Knowledge of the essential points of the subject but not the ability to go into details (*e.g.*, the type of manoeuvre which should be understood with the aid of the book).
- C Knowledge of the existence of the subject, the purpose of it and where to look up further details if required.

SUBJECT	R.O.2(T)	L.R.O.(T) (FLEET BOARD)	L.R.O.(T)	C.Y. (PROV.)	C.Y.	T.C.I.	R.O.2(G)	L.R.O.(G)	R.S.	R.C.I.	R.O.2(W)	L.R.O.(W)	R.S.(W)	E.W.I.
GENERAL														
Relationship and function of all signal books	C	B	A	A	A	A	—	—	—	—	—	—	—	—
A.N.S.B. instructions, A.N.S.B., Chapter 1	B	A*	A*	A*	A*	A*	C	B	A	A	C	B	A	A
Colours and meanings of flags and pennants, A.N.S.B., Chapter 2	A	A*	A*	A*	A*	A*	—	—	—	—	—	—	—	—
Emergency signals, A.N.S.B., Chapter 3	A	A*	A*	A*	A*	A*	B	B	A	A	B	B	A	A
Remaining chapters and tables of A.N.S.B. including Inter-R.N. Supplement.	C	A	A	A	A	A	—	—	—	—	—	—	—	—
Layout of A.N.M.I.	C	A	A	A	A	A	—	—	—	—	—	—	—	—
VISUAL CALLSIGNS														
A.C.P. 118, B.R. 70, A.C.P. 113, A.C.P. 165, Section 2 and Type Indicators.	B	A	A	A	A	A	C	B	B	B	C	B	B	B
PRINCIPAL DEFINITIONS														
A.N.M.I., Chapter 1, plus Articles 421, 422, 501-504	B	A	A	A	A	A	—	—	—	—	—	—	—	—
ORGANISATION AND COMMAND—A.N.M.I., CHAPTER 2														
Fleet organisation	B	B	B	A	A	A	C	C	B	B	C	C	B	B
Command and mission relationship during support operations	—	—	—	—	C	C	—	—	—	—	—	—	—	—
Command functions	—	—	—	—	C	C	—	—	—	—	—	—	—	—
LEAVING AND ENTERING HARBOUR—A.N.M.I., CHAPTER 3	—	B	B	A	A	A	—	—	—	—	—	—	—	—
POSITION, COURSE AND SPEED—A.N.M.I., CHAPTER 4														
Position	C	B	A	A	A	A*	—	C	B	B	—	C	B	A
Course and speed	C	B	B	B	B	A	—	C	B	B	—	C	B	A
P.I.M.	—	C	B	B	A	A	—	C	B	B	—	C	B	B

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PRINCIPAL RULES FOR MANOEUVRING—A.N.M.I., CHAPTER 5

Distances	B
Turning distances	—
Guide and pivot	—
Special manoeuvring rules	—
Stationing	—
Man overboard	—
Breakdown at sea	—
Night and fog	—
Wartime cruising precautions	—

FORMATIONS AND DISPOSITIONS—A.N.M.I., CHAPTER 6

Single and multiple line formations	A
Circular formations	C
Operational formations and dispositions	—
Typical operational formations	—
Carrier formations	—
Typical operational dispositions	—

ALTERING COURSE—A.N.M.I., CHAPTER 7

Turning together	A
Wheeling	A
Special methods for altering course	C

SURFACE SCREENS—A.N.M.I., CHAPTER 8

Fundamentals	C
Rules for various types of screens	—
Altering course	—
Special instructions for A/S screens	—
Departure and entry	—
Smoke screens	—
Asymmetrical screens for damaged ships	—
Use of Table 'C'	—
Anti-aircraft screens	—

SCOUTING—A.N.M.I., CHAPTER 10

Introduction	—
Making contact	—
Stationing ships on a scouting line	—
Search	—
Patrols	—
Tracking	—
Reconnaissance	—

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256. Fleetwork—continued

SUBJECT	R.O.2(T)	L.R.O.(T) (FLEET BOARD)	L.R.O.(T)	C.Y. (PROV.)	C.Y.	T.C.I.	R.O.2(G)	L.R.O.(G)	R.S.	R.C.I.	R.O.2(W)	L.R.O.(W)	R.S.(W)	E.W.I.
A/S SURFACE OPERATIONS—A.N.M.I., CHAPTER 11														
Introduction	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Searches by ships	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Close surface search plans	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Spiral searches	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Area and bottom search	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Patrols by ships	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Countermeasures against submarines and torpedoes	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Procedure when a submarine contact is made	..	..	..	..	..	..	..	..	..	..	..	..	..	..
A/S Action Tables	..	..	..	..	..	..	..	..	..	..	..	..	..	..
A/S AIR OPERATIONS—A.N.M.I., CHAPTER 12														
Objective of A/S Air operations	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Non-directional Sonobuoy and MAD investigation and close search and tracking	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Sonobuoy barriers	..	..	..	..	..	..	..	..	..	..	..	..	..	..
MAD investigation	..	..	..	..	..	..	..	..	..	..	..	..	..	..
MAD hunting tactics	..	..	..	..	..	..	..	..	..	..	..	..	..	..
MAD tracking tactics	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Baiting and hold down tactics	..	..	..	..	..	..	..	..	..	..	..	..	..	..
A/S aircraft screening, search and patrol plans	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diagrams	..	..	..	..	..	..	..	..	..	..	..	..	..	..
HUNTER/KILLER OPERATIONS—A.N.M.I., CHAPTER 13														
Introduction	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Using carrier aircraft	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Command and control	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Action during Phase 1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Action during Phase 2	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Action during Phase 3	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Using shore-based aircraft	..	..	..	..	..	..	..	..	..	..	..	..	..	..
DEFENCE OF A CONVOY—A.N.M.I., CHAPTER 14														
Introduction	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mercant	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Formation and manoeuvring	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Altering course	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Surface A/S and A.A. screens	..	..	..	..	..	..	..	..	..	..	..	..	..	..
A/S operations in convoy escorting	..	..	..	..	..	..	..	..	..	..	..	..	..	..
A/S close surface search plans	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Aircraft operating	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Defence against air or surface attack	..	..	..	..	..	..	..	..	..	..	..	..	..	..

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255. Miscellaneous

Standards

- A Thorough knowledge and ability to look up references quickly.
- B Good knowledge and general idea of where references are to be found.
- C Knowledge of principles only. General idea of in what books information is contained.

SUBJECT	J.R.O./ R.O.3	R.O.2 (T)	R.O.2 (G)	R.O.2 (W)	L.R.O. (T)	L.R.O. (G)	L.R.O. (W)	C.Y.	R.S.	R.S. (W)	T.C.I.	R.C.I.	E.W.I.
OPERATING SIGNALS—A.C.P. 131													
Signals in common use	B	A	A	A	A	A	A	A	A	A	A	A	A
M.S.B. (B.R. 98 3))													
Chapters 1-4.—Knowledge as for the appropriate													
sections of A.C.P. 118, 125, 129, A.T.P. 1A, Vol. 2,													
from which they have been extracted.													
Chapter 4.—Article 404-405 Wireless call signs ..		C	C	C	B	B	B	B	A	A	A	A	A
Chapter 5.—Special instructions for craft and boats													
Chapter 7.—Phrase section													
INTERNATIONAL CODE, VOLUME 1 (B.R. 69 (1))													
Chapter 1.—Definitions													
Chapter 2.—Methods of signalling													
Chapter 3.—General instructions													
Chapter 9.—Use of signal code													
Single-letter signals		C	C	C	B	B	B	B	A	A	A	A	A
Two-letter signals													
Points of compass bearings, standard times, punctua-													
tion and amplifying phrases.													
Model verb		C	C	C	B	B	B	B	A	A	A	A	A
General code													
Geographical section													
Appendix "A"—Distress													
Appendix "B"—Pilot signals													
Appendix "C"—Quarantine signals													
Appendix "D"—Towing													
Appendix "E"—Life saving organisation—signals													
and rocket apparatus.													

255. Miscellaneous—continued

SUBJECT	J.R.O./ R.O.3	R.O.2	R.O.2 (T)	R.O.2 (G)	R.O.2 (W)	L.R.O. (T)	L.R.O. (G)	L.R.O. (W)	C.Y.	R.S.	R.S. (W)	T.C.I.	R.C.I.	E.W.I.
CEREMONIAL (Q.R. & A.I.)														
<i>Standards and Distinguishing Flags</i>														
The Sovereign (Article 1201) ..	—	C	B	—	—	B	—	—	A	—	—	A	—	—
H.R.H. Prince Phillip, Duke of Edinburgh, The Queen Mother and other members of the Royal Family (Article 1202–1204) ..	—	—	C	—	—	B	—	—	B	—	—	B	—	—
Naval Authorities (Articles 1205–1207, 1209) ..	C	C	A	C	C	A	C	C	A	C	C	A	C	C
Other Authorities (Articles 1213, 1214) ..	—	—	C	—	—	B	—	—	A	—	—	A	—	—
Flags and pennants displaced (Article 1211) ..	—	—	C	—	—	B	—	—	A	—	—	A	—	—
<i>Colours</i>														
Wearing by ships in commission (Articles 1232, 1233) ..	C	B	A	C	C	A	C	C	A	C	C	A	C	C
Commonwealth Vessels of War (Article 1234) ..	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Hoisting and hauling down ceremony (Article 1236, 1359, 1360) ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Halfmasting (Article 1239 Clause 1) ..	C	C	A	C	C	A	C	C	A	C	C	A	C	C
Halfmasting (Article 1239 Clauses 2–9) ..	C	C	A	C	C	A	C	C	A	C	C	A	C	C
Lowering flags (Article 1238) ..	C	C	A	C	C	A	C	C	A	C	C	A	C	C
Masthead pendant (Article 1210) ..	C	C	A	C	C	A	C	C	A	C	C	A	C	C
Queen's Colour and White Ensign (Article 1231) ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Launches of ships (Article 1242) ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Blue Ensign (Article 1251) ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—
R.A.F. Ensign (Article 1235) ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Flags to be flown on shore (Article 1248) ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Courts martial (Article 1243) ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Boats Ensign (Article 1271) ..	—	C	C	—	—	C	—	—	A	—	—	A	—	—
<i>Dressing Ship</i>														
(Article 1240) ..	C	C	B	C	C	A	C	C	A	C	C	A	C	C
Commonwealth Navies (Article 1241) ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<i>Flags in Boats, Aircraft and Cars</i>														
Boats, flags, pendants and discs (Articles 1273, 1274, 1277, 1278) ..	C	C	B	C	C	A	C	C	A	C	C	A	C	C
Admiralty Flag and Admiralty Plate (Article 1272) ..	—	C	C	—	—	B	—	—	B	—	—	A	—	—
Chief of Staff and Captain of the Fleet (Article 1275) ..	—	C	C	—	—	B	—	—	A	—	—	A	—	—
Queen's Harbour Master (Article 1276) ..	—	C	C	—	—	B	—	—	A	—	—	A	—	—
General Officers and Brigadiers, R.M. (Article 1279) ..	—	—	C	—	—	B	—	—	A	—	—	A	—	—
Naval aircraft (Article 1280) ..	—	—	C	—	—	B	—	—	A	—	—	A	—	—
Cars (Article 1281) ..	C	C	C	—	—	B	—	—	A	—	—	A	—	—

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256. Radio Communication Organisation

Standards

- A Thorough knowledge and ability to look up references quickly.
- B Good knowledge and general idea of where references are to be found.
- C Knowledge of principles only. General idea of in what books the information is contained.

SUBJECT	J.R.O./ R.O.3	R.O.2	R.O.2 (T) (W)	R.O.2 (G)	L.R.O. (T) (W)	L.R.O. (G)	C.Y./ R.S. (W)	R.S.	T.C.I./ E.W.I.	R.C.I.
RADIO PROPAGATION										
Practical applications	—	—	—	C	C	C	C	A	B	A
Theory of radio propagation	C	C	C	A	B	A	B	A	B	A
Naval frequency bands	C	C	C	C	B	C	A	A	A	A
I.T.U. frequency bands	—	—	—	—	—	B	—	B	—	A
Frequency guides and forecasts	—	—	—	C	—	C	—	A	—	A
Frequency allocation	—	—	—	C	—	C	—	B	—	A
Means of radio communications	C	C	C	B	B	A	A	A	A	A
NAVAL COMMAND STRUCTURE (see also G.C.I.)										
Naval Command areas—C-in-C.s and F.O.s	C	C	C	B	B	A	A	A	A	A
N.A.T.O. Command areas—Sub-area Commanders Aclant, Acchan, C-in-C. Med.	—	—	—	C	C	C	B	B	A	A
Home station	—	—	—	C	C	C	C	C	C	C
NCSS organisation	—	—	—	C	C	C	C	B	C	B
NAVAL COMMAND COMMUNICATIONS										
Area and Command radio stations	—	—	—	C	C	B	C	A	B	A
Fixed services	—	—	—	C	C	C	—	B	—	A
Shore broadcasts and nets	—	—	—	C	C	C	—	C	—	C
Use of commercial facilities	—	—	—	C	C	C	C	B	C	B
BROADCASTS										
<i>Primary Ship Broadcasts</i>	C	C	C	C	C	B	B	A	A	A
Areas, Types, National/Allied	A	A	A	A	A	A	A	A	A	A
Conduct, Serials, S/T.O.P.s	A	A	A	A	A	A	A	A	A	A
Setting watch, guards, failure	A	A	A	A	A	A	A	A	A	A

<i>Other Broadcasts</i>											
Submarine, Met. and other Special	..	..	..	..	..	..	..	..	..	..	A
<i>Merchant Ships</i>											
Long and short distance organisation	..	..	..	..	..	..	..	..	..	..	A
G.B.M.S. and Mercast	..	..	..	..	..	..	..	..	..	..	A
SHIP-SHORE											
Watch organisation, peace and war	..	..	..	..	..	..	..	..	..	..	A
Use of S7	..	..	..	..	..	..	..	..	..	..	A
Allied complexes	..	..	..	..	..	..	..	..	..	..	A
LOCAL COMMUNICATIONS											
Coastal and local exercise nets in national use	..	..	..	..	..	..	..	..	..	..	A
Allied organisations. Local and Secondary broadcasts, and Ship-Shore.	..	..	..	..	..	..	..	..	..	..	A
HARBOUR COMMUNICATIONS											
Nets	..	..	..	..	..	..	..	..	..	..	A
Watch kept..	..	..	..	..	..	..	..	..	..	..	A
Guards	..	..	..	..	..	..	..	..	..	..	A
Exercises	..	..	..	..	..	..	..	..	..	..	A
Other harbour facilities	..	..	..	..	..	..	..	..	..	..	A
FLEET COMMAND ORGANISATION											
National seagoing Commanders, F.O.2s, F.O.A.C., Captains (ES) (D) (F) (SM) (MS).	..	..	..	..	..	..	..	..	..	..	A
O.T.C. Screen and S.A.U. Cdrs. A.S.W. Deputy. S.O.S.F. Air Defence/Helo Control ships. Convoy Commodore, E.F.C.	..	..	..	..	..	..	..	..	..	..	A
Task and type organisation	..	..	..	..	..	..	..	..	..	..	A
Operational dispositions, formations and tactics. Pickets	..	..	..	..	..	..	..	..	..	..	A
Joint operational agencies	..	..	..	..	..	..	..	..	..	..	A
FLEET COMMUNICATIONS											
<i>Passage</i>	..	..	..	..	..	..	..	..	..	..	A
Cruising nets—watch-independent and in company	..	..	..	..	..	..	..	..	..	..	A
500 kcs.	..	..	..	..	..	..	..	..	..	..	A
Sailing signal. Position reports	..	..	..	..	..	..	..	..	..	..	A
Task Force Broadcast and Command Nets	..	..	..	..	..	..	..	..	..	..	A

256. Radio Communication Organisation—continued

SUBJECT	J.R.O./ R.O.3	R.O.2	R.O.2 (T) (W)	R.O.2 (G)	L.R.O. (T) (W)	L.R.O. (G)	C.V./ R.S. (W)	R.S.	T.C.I./ E.W.T.	R.C.I.
<i>FLEET COMMUNICATIONS—continued</i>										
<i>Anti-Submarine Warfare</i>										
Escort SAU nets	C	C	C	B	A	A	A	A	A	A
A.S.W. aircraft and helicopter nets	C	—	—	C	B	A	B	A	B	A
Maritime air communications	—	—	—	C	B	A	B	A	B	A
<i>Air Defence</i>										
Air defence nets	—	—	C	B	A	A	B	A	A	A
A.E.W.—nets, links	—	—	C	C	B	A	B	A	B	A
<i>Air Operating</i>										
Carrier air nets	—	—	C	C	C	A	C	A	C	A
Strike communications	—	—	C	C	C	A	C	A	C	A
Associated safety nets	—	—	C	C	C	A	C	A	C	A
<i>Convoy</i>										
Internal organisation, MF and VHF, Conditions	—	—	C	C	C	A	B	A	B	A
<i>Amphibious—Joint</i>										
Command, control and support nets	—	—	—	—	C	C	C	B	C	A
<i>Submarine</i>										
Broadcast—control and reception	—	—	—	C	C	C	B	B	B	A
Exercise, safety and co-operating nets	—	—	C	C	C	A	A	A	B	A
Diving, surfacing, check, deepfield signals	—	—	C	C	C	A	A	A	A	A
<i>Shore-Naval-Air</i>										
Airfield organisation	—	—	—	C	B	B	B	A	B	A
NAS nets	—	—	C	C	B	B	C	A	B	A
Radio navigation aids	—	—	C	C	B	B	C	A	B	A
Ships/NAS nets and organisation	—	C	C	—	—	—	—	—	—	—
<i>Safety</i>										
SAR organisation and nets	—	C	C	B	A	A	A	A	A	A
Submiss/Subsunk/Smashex organisation and nets	—	C	C	B	A	A	A	A	A	A
<i>Complans</i>										
Layout, symbols	—	C	B	B	A	A	A	A	A	A
Compilation	—	C	—	A	—	—	—	—	—	—

257. Radio Communication Equipment (Technical) Standards of Knowledge

STANDARD REQUIRED	EQUIPMENT		OTHER SUBJECTS
1	2	3	4
	Operation of equipment.	(i) Characteristics of equipment. (ii) Component parts covered. (iii) Ability to obtain further knowledge.	
A	The ability to tune rapidly and efficiently without the aid of tuning guides, to operate and recognise a major failure or reduction in performance.	(i) Full knowledge. (ii) A good knowledge of functions, principle of operation and circuitry associated with the operation of user controls. (iii) N.A.	A thorough knowledge and ability to look up references quickly.
B	The ability to tune rapidly without the aid of tuning guides, to operate and to recognise a major failure or reduction in performance.	(i) A full knowledge. (ii) Knowledge of the function and principles of operation associated with the operation of user controls. (iii) Ability to obtain "A" knowledge from study of relevant handbooks.	A good knowledge and general idea of where references are to be found.
C	The ability to tune and operate efficiently with the aid of a tuning guide.	(i) General knowledge. (ii) Knowledge of the function. (iii) Ability to obtain "A" knowledge from study of relevant handbooks.	Knowledge of principles only and a general idea of where references are to be found.
D	Ability to operate (ability to tune and set up the equipment not required).	(i) General knowledge. (ii) Knowledge of the function. (iii) Ability to obtain "B" knowledge from study of B.R. 222.	A general knowledge confined to principles.

Note.—The use of tuning guides applies to transmitters only.

257. Radio Communication Equipment (Technical)—continued

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Change No. 5

RADIO COMMUNICATION EQUIPMENT (TECHNICAL)		J.R.O./ R.O.3	R.O.2	R.O.2 (G)	R.O.2 (W)	L.R.O. (G)	L.R.O. (W)	R.S.	R.S. (W)	R.C.I.	E.W.I.	REMARKS
TRANSMITTERS												
602/E ..	..	—	—	—	D	C	D	C	C	A	C	Note.—For S/M ratings instruction should concentrate on 623, 619 and 696. Note.—For R.O.2 either 618 or 619 may be studied, dependent on which is fitted in rating's ship. Note.—In addition L.R.O. (G) and L.R.O. (W) must acquire a "B" knowledge of one low power HF/MF transmitter, one fitted in own ship at time of examination being selected.
603/5 ..	..	—	—	—	D	C	D	C	A	A	A	
640 ..	..	—	—	—	D	C	D	C	B	B	B	
618 ..	..	—	—	—	D	C	D	C	B	B	B	
619 ..	..	—	—	—	C	C	C	C	B	B	B	
623 ..	..	—	—	—	C	C	C	C	B	B	B	
691/696 ..	..	—	—	—	See remarks column	C	D	C	B	B	B	
692/3 ..	..	—	—	—								
89Q/GK185A ..	..	—	—	—								
633 ..	..	—	—	—	D	C	D	C	B	B	B	
Integrated communication system	..	—	—	—	D	C	D	C	B	B	B	
689 ..	..	—	—	—	D	C	D	C	B	B	B	
RECEIVERS												
B40/B41 ..	..	C	—	—	B	A	B	A	C	A	A	A B B B B B
CJK ..	..	—	—	—	D	C	D	C	B	B	B	
CAS ..	..	—	—	—	C	C	C	C	B	B	B	
CAT ..	..	—	—	—	C	C	C	C	B	B	B	
CUH ..	..	—	—	—	D	C	D	C	B	B	B	
CUJ ..	..	—	—	—	D	C	D	C	B	B	B	
PORTABLES												
615/625 ..	..	C	—	—	C	B	C	B	B	B	B	B B B C
622 ..	..	—	—	—	D	D	D	D	B	B	B	
629 ..	..	—	—	—	D	D	D	D	B	B	B	
634 ..	..	—	—	—	D	D	D	D	C	B	C	
DIRECTION FINDING												
FM12 ..	..	C	—	—	D	B	B	C	A	A	A	A A B C
DF calibration ..	..	—	—	—	D	B	C	D	A	A	B	
FH4 ..	..	—	—	—	D	B	C	D	A	A	C	
FU1 ..	..	—	—	—	D	B	C	D	B	B	C	

257. Radio Communication Equipment (Technical)—continued

RADIO COMMUNICATION EQUIPMENT (TECHNICAL)	J.R.O./ R.O.3	R.O.2	R.O.2 (G)	R.O.2 (W)	L.R.O. (G)	L.R.O. (W)	R.S.	R.S. (W)	R.C.I.	E.W.I.
CONTROL OUTFITS										
KHB	—	—	—	—	C	—	B	B	A	B
KHF	—	—	—	—	B	C	B	B	A	B
RATT										
Shipborne RATT	C	C	B	C	B	C	B	B	B	B
MISCELLANEOUS										
Aerial outfits and exchanges	—	D	C	D	C	D	A	A	A	A
Wire aerials, emergency aerials, aerial maintenance	—	D	C	D	B	D	A	A	A	B
EAL	—	—	C	D	C	D	B	B	A	B
EAM	—	—	C	D	C	D	C	C	A	A
Safety	—	—	C	D	C	D	A	B	A	B
Nomenclature of sets	—	—	C	D	C	D	B	B	B	B
Layouts	—	—	C	D	C	D	B	B	B	B
Power supplies	—	—	C	D	C	D	B	B	B	B
Emergency power supplies	—	—	C	D	C	D	B	B	B	B
Records, reports	—	—	C	D	C	D	B	B	B	B
Stores	—	—	C	D	C	D	B	B	B	B
Shore equipment	—	—	C	D	C	D	B	B	B	B
S/M, R.F.A. and merchant ship equipment	—	—	C	D	C	D	B	B	B	B
Radio hazards	—	—	C	D	C	D	B	B	B	B

258. Radio Communication Equipment (Theory)**Standards.**

A Good knowledge of application of principles from users' viewpoint.

B General understanding.

C Elementary knowledge.

In addition to the basic theory shown in this table the radio theory principles involved in particular equipments in the R.C.E. (Tactical) tables are taught as follows:—
 "A" knowledge equipments—circuitry employed in operation of user controls.
 "B" knowledge equipments—principles employed without circuitry details.

SUBJECT	J.R.O./ R.O.3	R.O.2	R.O.2 (G)	R.O.2 (W)	L.R.O. (G)	L.R.O. (W)	R.S.	R.S. (W)	R.C.I.	E.W.I.
BASIC ELECTRICITY										
Conductors and insulators. Fundamentals of magnetism ..	C	C	B	B	B	B	A	A	A	A
Resistance, E.M.F., current, Ohm's law ..	C	C	B	B	B	B	A	A	A	A
Outline of electro magnetism, solenoids and D.C. coils ..	C	C	B	B	B	B	B	B	A	A
Outline of D.C. motors and generators ..	C	C	B	B	B	B	A	A	A	A
Fundamentals of A.C. electricity ..	C	C	B	B	B	B	A	A	A	A
Differences between A.C. and D.C. ..	C	C	B	B	B	B	A	A	B	B
Concept of a vector ..	C	C	B	B	B	B	A	A	A	A
Action of a transformer, coupled circuits ..	C	C	B	B	B	B	A	A	A	A
Response of R, L, and C to A.C. ..	C	C	B	B	B	B	A	A	A	A
Series and parallel resonance ..	C	C	B	B	B	B	A	A	A	A
Impedance ..	C	C	B	B	B	B	A	A	A	A
Oscillatory circuits. Crystals ..	C	C	B	B	B	B	A	A	A	A
The piezo-electric effect ..	C	C	B	B	B	B	A	A	A	A
BASIC COMMUNICATIONS										
Principles of propagation ..	C	C	B	B	B	B	B	B	A	A
Abnormal propagation ..	C	C	B	B	B	B	B	B	A	A
Conversion of λ to f and vice-versa ..	C	C	B	B	B	B	B	B	A	A
Forms of modulation and emission (as in A.F.O. S.6) ..	C	C	B	B	B	B	B	B	A	A
Murray code. The baud, relationship between baud speed and bandwidth.	C	C	B	B	B	B	B	B	A	A
Production of F.S.K. and 2-tone emission ..	C	C	B	B	B	B	B	B	A	A
Concept of D.S.B. working ..	C	C	B	B	B	B	B	B	A	A
Concept of S.S.B. working and comparison with D.S.B.	C	C	B	B	B	B	B	B	A	A
Comparison of F.M. and A.M. methods ..	C	C	B	B	B	B	B	B	A	A

258. Radio Communication Equipment (Theory)—continued

SUBJECT	J.R.O./ R.O.3	R.O.2	R.O.2 (G)	R.O.2 (W)	L.R.O. (G)	L.R.O. (W)	R.S.	R.S. (W)	R.C.I.	E.W.L.
CIRCUITRY										
Value "space charge"	C	C	C	C	C	C	B	B	A	A
Action of a diode	C	C	C	C	C	C	B	B	A	A
Half and full wave rectification	—	—	—	—	—	—	B	B	A	A
Smoothing	—	—	—	—	—	—	B	B	A	A
Metal rectifiers	—	—	—	—	—	—	B	B	A	A
Bridge circuits	—	—	—	—	—	—	B	B	A	A
Stabilisation	—	—	—	—	—	—	B	B	A	A
Construction and action of the triode	C	C	C	C	C	C	B	B	A	A
The triode as a voltage amplifier	—	—	—	—	—	—	B	B	A	A
Bias and methods of obtaining bias	—	—	—	—	—	—	B	B	A	A
Coupling and decoupling	—	—	—	—	—	—	B	B	A	A
Action of tetrode, beam tetrode and pentode	—	—	—	—	—	—	B	B	A	A
Tuned amplifiers (as in receiver R.F. and I.F. stages)	—	—	—	—	—	—	B	B	A	A
Class "B" and "C" amplification	—	—	—	—	—	—	B	B	A	A
Positive and negative feedback	—	—	—	—	—	—	B	B	A	A
"Q" and the factors that affect it	—	—	—	—	—	—	B	B	A	A
Signal to noise ratio	—	—	—	—	—	—	B	B	A	A
V.F.O., P.C.C. and V.O. (UHF equipment) techniques	—	—	—	—	—	—	B	B	A	A
THE RECEIVER										
Action of a straight receiver (capable of C.W. reception)	C	C	C	C	C	C	B	B	A	A
Action of a superhnet receiver (capable of C.W. reception)	C	C	C	C	C	C	B	B	A	A
THE TRANSMITTER										
Action of a typical transmitter (capable of C.W., M.C.W. and voice emission).	C	C	C	C	C	C	B	B	A	A
AERIALS AND DF										
Types of aerial	—	—	—	—	—	—	B	B	A	A
Aerial arrays	—	—	—	—	—	—	B	B	A	A
Radiation from an aerial	—	—	—	—	—	—	B	B	A	A
Transmission lines, standing waves, impedance matching. Basic principles of common aerial working with particular reference to outfits EAL, EAM and UHF.	—	—	—	—	—	—	B	B	A	A

259. W/T Procedure

Standards

- A Thorough knowledge and good practical ability.
- B Good knowledge and fair practical ability.
- C Knowledge of principles and fair practical ability under supervision.

	J.R.O./ R.O.3	R.O.2	R.O.2 (T) (W)	R.O.2 (G)	L.R.O. (T) (W)	L.R.O. (G)	C.Y./R.S. (W)	R.S.	T.C.I. E.W.I.	R.C.I.
Layout of A.C.P. 124B and A.C.P. 131A	..	..	..	..	..	..	..	..	..	..
Instructions to operators	..	..	..	..	..	..	..	..	..	..
Transmitting techniques	..	..	..	..	..	..	..	..	..	..
Prosigns and meanings	..	..	..	..	..	..	..	..	..	..
Types of message	..	..	..	..	..	..	..	..	..	..
Basic message format	..	..	..	..	..	..	..	..	..	..
Calling and answering	..	..	..	..	..	..	..	..	..	..
Signal strength and readability	..	..	..	..	..	..	..	..	..	..
Message transmission and transmission identity	..	..	..	..	..	..	..	..	..	..
Transmission instructions, use of FG and T	..	..	..	..	..	..	..	..	..	..
Precedence, single and dual	..	..	..	..	..	..	..	..	..	..
Message instructions	..	..	..	..	..	..	..	..	..	..
Message address	..	..	..	..	..	..	..	..	..	..
Message re-addressal	..	..	..	..	..	..	..	..	..	..
Final instructions, message ending, use of B, C, AS	..	..	..	..	..	..	..	..	..	..
Transmission of long messages	..	..	..	..	..	..	..	..	..	..
Prefix, counting and checking groups	..	..	..	..	..	..	..	..	..	..
Identification, repetitions, verifications, corrections, use of IMI	..	..	..	..	..	..	..	..	..	..
Check of reception	..	..	..	..	..	..	..	..	..	..
Words twice	..	..	..	..	..	..	..	..	..	..
Break in procedure	..	..	..	..	..	..	..	..	..	..
Test signals and tuning	..	..	..	..	..	..	..	..	..	..
Emergency silence	..	..	..	..	..	..	..	..	..	..
Radio guards	..	..	..	..	..	..	..	..	..	..
Messages in strings	..	..	..	..	..	..	..	..	..	..
Refiling and reprocessing messages	..	..	..	..	..	..	..	..	..	..
Ending of air/ground communications	..	..	..	..	..	..	..	..	..	..
Executive method	..	..	..	..	..	..	..	..	..	..
Broadcast procedure, reruns on Broadcast traffic	..	..	..	..	..	..	..	..	..	..
"I" method procedure	..	..	..	..	..	..	..	..	..	..
Ship-Shore procedure	..	..	..	..	..	..	..	..	..	..
Enemy contact reports—procedure	..	..	..	..	..	..	..	..	..	..
DF procedure	..	..	..	..	..	..	..	..	..	..
Commercial procedure	..	..	..	..	..	..	..	..	..	..
T.R. procedure	..	..	..	..	..	..	..	..	..	..

260. V/S Procedures

Standards

- A Very high standard of knowledge and practical ability in every detail.
- B A good knowledge of the main principles and good practical ability under supervision.
- C A knowledge of the main principles of the subject and practical ability under supervision.

Note.—The lettered standards are only a guide. Proper emphasis (in some cases up to "A" standard) should be given to those portions of any subject listed below that directly concern the ratings under instruction, even though the general classification may be of a lower standard. Other portions of the subject may possibly be missed out altogether.

	J.R.O./ R.O.3	R.O.2 (T)	R.O.2 (G)	R.O.2 (W)	L.R.O. (T)	L.R.O. (G)	L.R.O. (W)	C.Y.	R.S.	R.S. (W)	T.C.I.	R.C.I.	E.W.I.
VISUAL SIGNALLING (S.1, CHAPTER 10)	..	..	..	..	..	..	..	..	..	..	..	..	..
INSTRUCTIONS—A.C.P. 129, CHAPTER 1													
General	..	..	..	..	..	..	..	..	..	..	..	..	..
Message forms	..	..	..	..	..	..	..	..	..	..	..	..	..
Schematic diagrams	..	..	..	..	..	..	..	..	..	..	..	..	..
OPERATING SIGNALS AND PROSIGNS—A.C.P. 129, CHAPTER 2													
General	..	..	..	..	..	..	..	..	..	..	..	..	..
Description and use of prosigns	..	..	..	..	..	..	..	..	..	..	..	..	..
VISUAL PROCEDURE—A.C.P. 129, CHAPTER 3													
General	..	..	..	..	..	..	..	..	..	..	..	..	..
Use of precedence prosigns	..	..	..	..	..	..	..	..	..	..	..	..	..
Group count	..	..	..	..	..	..	..	..	..	..	..	..	..
Message address	..	..	..	..	..	..	..	..	..	..	..	..	..
Identifications, corrections, verifications and cancellations.	..	..	..	..	..	..	..	..	..	..	..	..	..
Acknowledgements	..	..	..	..	..	..	..	..	..	..	..	..	..
Rules for refiling messages	..	..	..	..	..	..	..	..	..	..	..	..	..
Visual responsibility—A.C.P. 129, Chapter 4	..	..	..	..	..	..	..	..	..	..	..	..	..
Flashing light—A.C.P. 129, Chapter 5	..	..	..	..	..	..	..	..	..	..	..	..	..
Semaphore—A.C.P. 129, Chapter 6	..	..	..	..	..	..	..	..	..	..	..	..	..
Flaghoist—A.C.P. 129, Chapter 7	..	..	..	..	..	..	..	..	..	..	..	..	..

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261. Voice Operating

Standards

- A Thorough knowledge and good practical ability.
- B Good knowledge and fair practical ability.
- C Knowledge of principles and where to look up details.

SUBJECT	J.R.O./ R.O.3	R.O.2	R.O.2 (T)	R.O.2 (G)	R.O.2 (W)	L.R.O. (T)	L.R.O. (G)	L.R.O. (W)	C.Y.	R.S.	R.S. (W)	T.C.I.	R.C.I.	E.W.I.
Voice technique ..	A	A	A	A	A	A	A	A	A	A	A	A	A	A
General instructions to operators ..	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Basic message format ..	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Types of messages ..	B	A	A	A	A	A	A	A	A	A	A	A	A	A
Operating rules ..	B	A	A	A	A	A	A	A	A	A	A	A	A	A
Executive methods ..	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Abbreviated procedure ..	C	A	A	B	B	A	A	A	A	A	A	A	A	A
Enemy reporting ..	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Internal reporting ..	A	A	A	B	B	B	B	B	A	C	C	C	C	C
International procedure ..	C	B	C	C	C	C	C	C	C	C	C	C	C	C
Air procedure ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Procedure used on A.I.O. nets ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Switch procedure ..	—	C	C	C	C	C	C	C	C	C	C	C	C	C

262. Automatic Telegraphy Procedure

Standards

- A Good knowledge and good practical ability.
- B Good knowledge and fair practical ability.
- C Knowledge of principles and fair practical ability under supervision.

SUBJECT	J.R.O./ R.O.3	R.O.2	R.O.2 (T), (G) and (W)	L.R.O. (T), (G) and (W)	C.Y. R.S. R.S. (W)	T.C.I. R.C.I. E.W.I.
Teleprinter 7B—ability to operate	—	—	A	A	A	A
Teleprinter No. 28—ability to operate	—	—	A	A	A	A
Teleprinter No. 12—ability to operate	A	A	A	A	A	A
Perforators, printing reperforators, auto-trans- mitters—ability to operate.	C	C	C	B	B	A
Murray code	—	—	A	A	A	A
Ability to recognise Murray code “space” and “letter shift”.	—	—	A	A	A	A
Definitions used in tape relay	C	C	C	B	A	A
World Wide Tape Relay network	C	C	B	A	A	A
Commonwealth Naval Section of World Wide Tape Relay network.	C	C	A	A	A	A
Construction and use of routing indicators ..	B	A	A	A	A	A
Basic message format	—	—	A	A	A	A
Preparation of messages for transmission	C	C	A	A	A	A
Multi-page and long messages	C	C	A	A	A	A
Correction of errors and cancellations	—	—	A	A	A	A
Circuit continuity, responsibility of receiving stations, self-addressed channel checks.	C	C	B	A	A	A
Routing in tape relay. Use of B.R. 1978 ..	—	—	A	A	A	A
Discrepancies in channel numbers	—	—	A	A	A	A
STRAD—functional requirements	—	—	A	A	A	A
Start of message functions (STRAD and non- STRAD).	—	—	B	B	A	A
Alternative routing	—	—	B	B	A	A
Transfer between sections	—	—	A	A	A	A
Missent and misrouted messages	—	—	C	B	A	A
Suspected duplicates and messages sent subject to correction.	—	—	C	C	B	B
U.K. Inter-broadcast AT Network	—	—	—	—	—	—
Defence Teleprinter Network	—	—	—	—	—	—
Defence Teleprinter Network procedure	B	B	A	A	A	A
Ratt Simplex procedure	—	—	C	B	A	A
Ratt Simplex Executive procedure	C	B	B	A	A	A
Ratt Broadcast procedure	—	—	C	C	A	A
Ratt Ship-Shore procedure	—	—	—	—	—	—
Ratt Combined Task Force Broadcast and Ship- Shore procedure.	C	B	A	A	A	A
Use of A.C.P. 131	—	—	—	—	—	—

263. Electronic Warfare Principles and Organisation

Standards

- A. Thorough knowledge and ability to look up references quickly.
B. Good knowledge and general idea of where references are found.
C. Knowledge of principles only. General idea of publications containing references.

SUBJECT	J.R.O./ R.O.3	R.O.2	R.O.2 (G)	R.O.2 (W)	L.R.O. (G)	L.R.O. (W)	R.S.	R.S. (W)	R.C.I.	E.W.I.
INTRODUCTION										
Scope of E.W. (Chapter 1)	..	..	..	..	..	..	..	..	..	..
E.W. family tree	..	..	..	..	..	..	..	..	..	..
THE BEHAVIOUR OF ELECTROMAGNETIC WAVES AND THEIR INTERCEPTION (Chapter 2).										
Polarisation	..	..	..	..	..	..	..	..	..	..
Modes of propagation	..	..	..	..	..	..	..	..	..	..
Frequency bands and usage	..	..	..	..	..	..	..	..	..	..
Diffraction and scatter	..	..	..	..	..	..	..	..	..	..
Effects of weather	..	..	..	..	..	..	..	..	..	..
Probability	..	..	..	..	..	..	..	..	..	..
Communications intercept and DF	..	..	..	..	..	..	..	..	..	..
Range advantage	..	..	..	..	..	..	..	..	..	..
Radar intercept and DF	..	..	..	..	..	..	..	..	..	..
Radar evasion	..	..	..	..	..	..	..	..	..	..
LOCATION AND ANALYSIS OF ENEMY ELECTRONIC TRANSMISSIONS (Chapter 3).										
Location and Homing	..	..	..	..	..	..	..	..	..	..
Principles of Reciprocal Intercept (C.B. 4863)	..	..	..	..	..	..	..	..	..	..
Radar characteristics and analysis	..	..	..	..	..	..	..	..	..	..
Use of Radar Data Books (C.B. 03199)	..	..	..	..	..	..	..	..	..	..
ELECTRONIC DECEPTION AND ANTI-DECEPTION MEASURES (Chapter 5).										
Communication deception	..	..	..	..	..	..	..	..	..	..
Radar deception	..	..	..	..	..	..	..	..	..	..
ELECTRONIC JAMMING (Chapter 6)										
General factors affecting jamming	..	..	..	..	..	..	..	..	..	..
SPOT and BARRAGE	..	..	..	..	..	..	..	..	..	..
Jamming of communications	..	..	..	..	..	..	..	..	..	..
Jamming of radar transmissions	..	..	..	..	..	..	..	..	..	..
Self-screening range	..	..	..	..	..	..	..	..	..	..
Anti-jamming measures and jamming of guided weapons	..	..	..	..	..	..	..	..	..	..

Chapter 3

OFFICERS

Section 1

SELECTION AND PROMOTION TO THE SPECIAL DUTIES LIST

301. General

a. These paragraphs are intended as a ready reference. Detailed instructions are laid down in Q.R. and A.I.

b. The Special Duties Officer, promoted from the (T) (G) or (W) sub-specialisation, will be expected to carry out the duties of a Junior Communication Officer. A considerable proportion of his course will therefore be devoted to opposite subject instruction (wireless for ex-(T), and VS for ex-(G) and (W) ratings).

302. Candidates

a. A long service or continuous service rating may apply to be considered as a candidate for promotion to the communication sub-specialisation of the Special Duties List if:—

(1) He has been confirmed as a Leading Radio Operator (T) (G) or (W), or higher rating.

(2) Either:—

(a) he has qualified educationally for S.D. rank, *i.e.*, holds H.E.T. certificate or equivalent, including a pass in practical mathematics; or

(b) he has qualified professionally for S.D. rank, *i.e.*, has passed professionally for Communication Yeoman, Radio Supervisor or Radio Supervisor (W), and served four years in seagoing ships since age of 17½ or date of entry if later; and

(3) he is recommended by his Commanding Officer as a potential S.D. candidate.

303. Half-yearly reports

As soon as these requirements are fulfilled, the Commanding Officer is to forward to the Captain, H.M.S. *Mercury*, a report on form S.198 together with a copy of the rating's service certificate and history sheet. His service certificate must be clearly endorsed that the rating is a S.D. candidate and that forms S.198 are required. Thereafter S.198 reports only should be rendered half-yearly on 31st May and 30th November, until the candidate is promoted or ceases to be eligible.

304. Final professional qualification prior to selection

a. The rating must then complete the educational and professional qualifications, as in paragraph 302. In addition he will require:—

(1) Sea service of not less than one year in the acting or confirmed Petty Officer rate.

(2) A certificate to say that he had had sufficient bridge experience at sea to make him familiar with the duties of an Officer of the Watch.

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305. Selection for course

a. Ratings who have attained the above qualifications will be considered by a selection board, to be convened by H.M.S. *Mercury* annually or half-yearly (according to the number of known vacancies) which will place all candidates in order of merit, taking into account their professional and educational qualifications, reports on S.198, age, length of service and the length of time since qualifying. All qualified candidates will be considered on every occasion until they are promoted or cease to be eligible.

b. Ratings will be nominated from the top of the order of merit to undergo a qualifying course. The number of candidates on any course will not exceed the number of known vacancies at the promotion date. Candidates will not be put on course unless they are medically fit for promotion and within the prescribed age limits at the promotion date.

306. Qualifying courses

a. The qualifying courses are divided into two parts, before and after promotion, and extend over a period of some 50 to 52 instructional weeks. The main sections of the course are as follows:—

(1) PART A. PRIOR TO PROMOTION

Basic communication course	..	..	H.M.S. <i>Mercury</i>
Seamanship and navigation course	..	..	H.M.S. <i>Dryad</i>

(2) PART B. AFTER PROMOTION

S.D. Officers' course	..	..	..	R.N. College, Greenwich
A.B.C.D.	..	..	..	R.N.A.D. and D.C. School
Gunnery	..	..	..	H.M.S. <i>Excellent</i>
T.A.S. and diving supervision	..	..	..	H.M.S. <i>Vernon</i>
Final communication course	..	..	..	H.M.S. <i>Mercury</i>

307. Promotion to Acting Sub-Lieutenant (SD)(C)

a. On successful completion of the Part A course, they will be promoted to Acting Sub-Lieutenant (SD)(C) provided they are:—

- (1) Still medically fit, recommended and a volunteer.
- (2) Within the prescribed age limits (25 to 34 years).
- (3) Their character is such as would, if continued, qualify them for the award of the Long Service and Good Conduct Medal (Q.R. and A.I., Article 1887(1) (a)) before going to pension, any hypothetical extension of service such as that permitted by Q.R. and A.I., Article 0827(23), being disregarded. Any candidate who is, at any time, awarded a character assessment inferior to 'Good' will, however, be disqualified. The particulars of candidates who are considered exceptionally deserving, or who have distinguished themselves by meritorious or special services, but who have not attained the foregoing standard of character, may be submitted to the Admiralty for special consideration.

b. After promotion candidates will undergo post-qualifying courses (Part B).

308-320. *Spare.*

Section 2

COMMUNICATION TRAINING

321. Instruction in communications and electronic warfare for officers

Instruction in communications and electronic warfare for officers is given as follows:—

ESTABLISHMENT	COURSE	REMARKS
H.M.S. <i>Mercury</i>	Qualifying course for Lieut. (X) (C)	See paragraph 322.
	Miscellaneous officers' courses, including long course of other specialisations.	Arranged direct with establishments concerned.
	Commanding Officers Small ships communication officers Electronic warfare for General List officers Ships' emergency cryptographic teams	For details see current A.F.Os.
	Acting Sub-Lieutenants General List (seamen and supply officers)	See paragraph 324.
Joint Warfare Establishment, Old Sarum.	Communications in joint warfare for long courses and S.D. officers	One week. See current A.F.Os.
Britannia Royal Naval College, Dartmouth	General and Supplementary List Cadets of all specialisations	See paragraph 325.
Ships	Midshipmen of all specialisations	One week. See current A.F.Os.

322. Course for officers qualifying for Lieutenant (X) (C)

(Q.R. and A.I., Article 0605 and Appendix 1, Part 3, Article 4)

a. In order that instruction may start on a common basis, candidates for the long (C) course must have attained a definite proficiency in signalling and have carried out certain pre-course study before starting the course. The fact that an officer has been selected for the course will be taken as an indication that he will attain this standard before starting the course. The standard set is not high since all candidates do not have equal opportunities for revision and practice.

b. Standards required are as follows:—

(1) *Practical Signalling*

Manual Morse Exercise		8 w.p.m.	80 per cent.
Flashing Receiving Exercise		8 w.p.m.	80 per cent.
Semaphore Receiving Exercise		8 w.p.m.	75 per cent.

(2) Knowledge of the colours and single meanings of Flags and Pennants and International Codes.

(3) *Radio Communication Equipment (Theory).*—Candidates should have taken steps to revise the elementary knowledge of Magnetism and Electricity imparted to them as Junior Officers. This knowledge should be consolidated and advanced by the study of the subject matter in B.R. 158(60), Examples in Electrical Calculations, Chapters 1, 2, 3, 4, 6, 7, 8, 10, 11, 12 and 16 with 20 and 21, the last two in particular.

c. *Qualifying Course*

- (1) The course lasts approximately one year.
- (2) To qualify, officers are required to obtain 80 per cent. in written and oral examinations on Communication subjects and 65 per cent. in Radio Communication Equipment (Theory). The following minimum practical standards must also be attained:—

V.R.X. (F.R.X.)	..	..	..	..	..	..	10 w.p.m.
(S.R.X.)	..	..	..	..	..	..	8 w.p.m.
V.T.X. (F.T.X.)	..	..	..	..	..	..	10 w.p.m.
(S.T.X.)	..	..	..	..	..	..	8 w.p.m.
M.M.X.	..	..	..	..	..	..	15 w.p.m.
M.T.X.	..	..	..	..	..	..	15 w.p.m.
B.K.X.	..	..	..	..	..	..	30/96
T.T.X.	..	..	..	..	..	..	30/96

323. Advanced Communication Course

On completion of the long (C) course a number of officers will be selected for the Advanced Course. This course is taken at the Royal Naval College, Greenwich, normally after completing one appointment as a (C) officer. The advanced course lasts two terms.

324. Training of Junior Officers (General List)

A. *Cadets (All Specialisations)*

a. Aim:

- (i) To train cadets to be capable of signalling at a moderate speed by flags, flashing and voice.
- (ii) To teach an understanding of fleetwork and methods of communication required by a Midshipman of the Watch.
- (iii) To impart a basic knowledge of the drafting and origination of naval messages.

b. Communications instructions is integrated with the basic syllabus of B.R.N.C. Dartmouth and the Dartmouth Training Squadron which lasts for one year.

c. Practical standard: FRX—5 w.p.m.

B. *Midshipmen (All Specialisations)*

a. Midshipmen are to be attached to the Communications Department of their ships for a period of one week's practical training to consolidate their previous instruction. This completes the communication training for officers of other than seaman or supply specialisation.

b. Practical standard: FRX—8 w.p.m.

C. *Acting Sub-Lieutenants (Seaman Specialisation)*

a. Aim:

- (i) To fit officers to become proficient Officers of the Watch at sea and in harbour in all types of ship.
- (ii) To train officers as Operations Room Officers.
- (iii) To train officers to undertake the duties of Communication Officer in frigates and smaller ships.

b. The course lasts five weeks at H.M.S. *Mercury*.

c. Practical standard: FRX—8 w.p.m.

D. *Acting Sub-Lieutenants (Supply Specialisation)*

a. Aim:

- (i) To fit officers to become proficient Officers of the Watch in harbour in all types of ship and to give sufficient grounding that officers suitably qualified may subsequently become Officers of the Watch at sea.

- (ii) To train officers as Operations Room Officers.
- (iii) To train officers for duties in an Emergency Crypto Team.
- b. The course lasts three weeks at H.M.S. *Mercury*.
- E. Current syllabi of these courses can be obtained from H.M.S. *Mercury* or B.R.N.C. Dartmouth as appropriate. Examination standards are laid down by A.F.O.

325. Training of Junior Officers (Supplementary List)

A. Cadets (*Seaman Specialisation*)

a. Aim:

- (i) To train officers to be capable of signalling at a moderate speed by flags, flashing and voice.
- (ii) To teach the understanding of fleetwork, communications and electronic warfare principles required by an Officer of the Watch.
- (iii) To train officers to perform the duties of Communication Officers of a small ship when no sub-specialist officer is borne, after further experience at sea, and to impart a knowledge of the drafting and origination of naval messages.

b. Communication instruction is integrated with the basic syllabus of B.R.N.C. Dartmouth and the Dartmouth Training Squadron which lasts for two terms. Instruction is to a higher standard than for General List Officers at this stage to bring officers as far as possible to the standard of the General List Acting Sub-Lieutenants course. No further communication courses are given to these officers but continuation training is to be given at sea as Midshipmen.

c. Practical standard: FRX—5 w.p.m.

B. Cadets (*Other Specialisations*)

A short introductory course to communications is given during basic training at B.R.N.C. Dartmouth.

C. Current syllabi of these courses can be obtained from B.R.N.C. Dartmouth.

326. *Spare.*

327. Dartmouth new scheme (commenced September 1960)

a. *First year.* During their first year of training cadets of all specialisations are given a short Communication course at Dartmouth with the following aims:—

- (i) To enable them to signal by flashing light and semaphore at 5 and 8 w.p.m. respectively.
- (ii) To give them an introduction to the duties and responsibilities of the Communication Branch, with particular reference to fleetwork to enable them to benefit from their time at sea as Midshipmen.

b. *Second year.* Midshipmen spend one year at sea with the Fleet.

c. *Third year.* Academic training at Dartmouth.

d. *Fourth year.* Syllabus will be published later. It will consist of five weeks Communication training.

Chapter 4

RESERVE COMMUNICATION RATINGS

Section 1

ENTRY, INITIAL TRAINING AND DUTIES

401. General

a. This chapter deals with the training and advancement of Reserve communication ratings. It is included as a guide to the officers and ratings of the Royal Navy concerned in the training of Reserve ratings, and is not intended to replace the fuller instructions contained in the R.N.R. regulations. W.R.N.R. training is dealt with in Chapter 5.

402. Entry of Tactical Communication Operators

a. Youth.—Recruits between 16½ and 17½ years of age who volunteer and are considered suitable for the Tactical Communication Branch join as Probationary Junior Tactical Communication Operators. Thereafter they do tactical communications concurrently with their new entry syllabus. At the age of 17½ they are rated Probationary Tactical Communication Operators 3rd class and as soon as they have completed new entry training and are qualified professionally, they are rated Tactical Communication Operators 3rd class.

b. Adult.—Recruits between 17½ and 26 years of age who volunteer and are considered suitable for the Tactical Communication Branch join as Probationary Tactical Communication Operators 3rd class. Thereafter they do tactical communications concurrently with their new entry syllabus, and on completion of the new entry course and when qualified professionally they are rated Tactical Communication Operators 3rd class.

c. Former Naval service.—Men with former Naval service may enter the Reserve between the ages of 18 and 40 and, if within five years of release, are permitted to count former service for all purposes except toward engagement. They are not required to carry out new entry training.

403. Tactical Communication Operator 2nd class

a. Employment at sea.—Operators 2nd class are to be employed as Tactical Operators of the watch.

b. Standard of practical ability required.—Operators 2nd class are required to have good operating ability in straight forward practical signalling. They are given an outline knowledge only of cryptography, and if required to carry out cryptographic duty, will have to be given special instruction in the billet concerned.

404. Leading Tactical Communication Operator

a. Employment at sea.—Leading Tactical Communication Operators are to be employed as Second Hands of watches, and during the later periods of their training as Leading Hands of watches. They are to be given every opportunity to exercise their initiative and power of command within the tactical communication department.

b. Standard of practical ability required.—Leading Tactical Communication Operators are required to have a good operating ability, and the following knowledge:—

- (1) A fair knowledge of basic Fleetwork.
- (2) ~~Outline~~ ^{A fair} knowledge of cryptography.
- (3) Fair knowledge of VS material.
- (4) A good knowledge of VS, voice and ship A.T. procedure.
- (5) A fair knowledge of general communication instructions.

Amdt No 1/60

405. Communication Yeoman

a. *Employment at sea.*—Communication Yeomen are to be given practical instruction, and experience under a responsible rating, in the working of all duties of the department as follows:—

- (1) Duties of Yeoman of the watch.
- (2) Duties of Yeoman of the M.S.O.
- (3) Duties of the Yeoman in charge of stores.

b. *Standard of practical ability required.*—Communication Yeomen are required to have a good operating ability and higher knowledge than Leading Tactical Communication Operators.

406. Chief Communication Yeoman

a. *Employment at sea.*—Chief Communication Yeomen must be given every opportunity to improve their knowledge of the duties and organisation of the tactical communication department, and should undertake some of the duties carried out by the Chief Communication Yeoman of the ship.

b. *Standard of practical ability required.*—The same standard as that required by a Communication Yeoman. No course or examination is held for this rate.

407. Entry of Radio Communication Operators

a. *Youth.*—Between 16½ and 17½ as Probationary Junior Radio Communication Operator.

b. *Adult.*—Between 17½ and 26 as Probationary Radio Communication Operator, 3rd class.

c. *Former Naval service.*—Men with former Naval service may enter between the ages of 18 and 40, and if within five years of release, are permitted to count former service for all purposes except towards engagement. They are not required to carry out new entry training.

408. Radio Communication Operator 2nd class

a. *Employment at sea.*—Operators 2nd class are to be employed as W/T, A.T., or voice operators.

b. *Standard of practical ability required.*—Operators 2nd class are required to have good operating ability under straightforward conditions. (~~They are given an outline knowledge only of cryptography, and if required to carry out cryptographic duties will have to be given special instruction in the matter concerned.~~)

Andt No. 1/60.

409. Leading Radio Communication Operator

a. *Employment at sea.*—Leading Radio Communication Operators are to be employed as senior operators of the watch, and during the later periods of their training, as Leading Hands of the watch. They are to be given every opportunity to exercise their initiative and power of command within the radio communication department.

b. *Standard of practical ability required.*—Leading Radio Communication Operators are required to have a good operating ability, and the following knowledge:—

- (1) A good knowledge of W/T, A.T., and voice procedure.
- (2) Ability to operate the more common forms of radio communication equipment.
- (3) ~~Outline knowledge of cryptography.~~
- (3) ~~A~~ A fair knowledge of radio communication organisation.
- (4) ~~A~~ A fair knowledge of general communication instructions.

Andt No. 1/60

410. Radio Communication Supervisor

a. Employment at sea.—Radio Communication Supervisors are to be given practical instruction, and experience under a responsible rating, in all duties of the radio communication department.

b. Standard of practical ability required.—Radio Communication Supervisors are required to have a good operating ability and a higher knowledge than Leading Radio Communication Operators.

411. Chief Radio Communication Supervisor

a. Employment at sea.—Chief Radio Communication Supervisors must be given every opportunity to improve their knowledge of the duties and organisation of the radio communication department, and should undertake some of the duties carried out by the Chief Radio Communication Supervisor of the ship.

b. Standard of practical ability required.—The same as that required for a Radio Communication Supervisor. No course or examination is held for this rate.

412. Radio Operator Special

a. Employment at sea.—Radio Operators Special are to be employed as operators of various types of E.W. equipment at sea.

b. Standard of practical ability required.—Radio Operators Special must be capable of operating the standard E.W. equipments, have a good knowledge of E.W. procedure and a fair knowledge of general communications.

413. Leading Radio Operator Special

a. Employment at sea.—Leading Radio Operators Special are normally to be employed as controlling operator on tactical E.W. Nets. as operator of important types of E.W. equipment, or in charge of the E.W. department of certain ships.

b. Standard of practical ability required.—Leading Radio Operators Special must be first class operators in every respect and have the following knowledge:—

- (1) Thorough knowledge of E.W. procedures.
- (2) A good knowledge of E.W. principles and organisation.
- (3) Ability to tune and operate E.W. equipment.
- (4) A fair knowledge of general communication organisation.

414. Radio Supervisor Special

a. Employment.—Radio Supervisors Special are normally to be employed as E.W. Controllers in a flagship or Squadron Leader or in charge of the watch in certain shore stations.

b. Standard of practical ability required.—Radio Supervisors Special are required to have higher standards of knowledge than Leading Radio Operators Special, and in addition:—

- (1) Ability to organise and control search and D/F in a force.
- (2) Fair knowledge of A.I.O. and ability to supervise the plotting and internal and external dissemination of E.W. information.
- (3) A knowledge of general communications procedures and organisation.

415. Chief Radio Supervisor Special

a. *Employment.*—Chief Radio Supervisors Special are normally to be employed on similar duties to Radio Supervisors Special, but in the more responsible and exacting positions.

b. *Standard of ability required.*—A Chief Radio Supervisor Special requires the same ability as a Radio Supervisor Special. No course or examination is held for this rate.

416-420. *Spare.*

Section 2

TRAINING AND ADVANCEMENT

421. Courses for Reserve ratings

Courses for Reserve ratings are carried out as follows:—

COURSES FOR	ESTABLISHMENT
Operators 2nd and 3rd class	Signal Training Centre, Devonport.
Leading and Petty Officer rate... ..	H.M.S. Mercury.
<i>and all Radio Special ratings</i>	

Amdt No 1/60

422. Syllabuses and standards of knowledge

Syllabuses for courses are prepared and issued by the Captain, H.M.S. Mercury, in consultation with Admiral Commanding Reserves. The standards of knowledge and passing percentages required are given in Section 3. ~~Provision is made for standards for recruitment from the Radio Special Branch although there is at present no direct entry scheme for such ratings, in the Reserve.~~

423. Advancement in the Royal Naval Reserve

a. The particular regulations for advancement are contained in B.R. 60, but in general the minimum qualifications are as follows:—

ADVANCEMENT TO	SENIORITY IN PRESENT RATE	SEAGOING SERVICE	EDUCATIONAL EXAMINATION	PROFESSIONAL EXAMINATION	V.G. CONDUCT
Operator, 2nd class	—	Nil	Nil	Yes	—
Leading rate	2 years	14 days as Acting Leading rate. Sea recommend.	E.T.1	Yes	12 months
Petty Officer rate	3 years including acting time	14 days as Acting P.O. Sea recommend.	E.T.1	Yes	18 months
Chief Petty Officer rate	3 years including acting time	14 days as P.O. Sea recommend.	E.T.1	No	—

424-450. Spare.

Section 3

EXAMINATIONS AND STANDARDS OF KNOWLEDGE

451. Introduction

a. This section contains details of passing percentages for Reserve Tactical and Radio Communication ratings and Radio Special ratings, and standards of knowledge tables, in the following subjects:—

General communication instructions

Fleetwork

Miscellaneous

Radio communication organisation

Radio technical

W/T procedure

Voice operating

VS procedure

Ship A.T. procedure

Shore A.T. procedure

Electronic warfare

Operating ability.

b. Standards of knowledge tables for cryptography are contained in the Cryptographic Operating Instructions.

c. Standards of knowledge tables for electronic warfare technical are held in H.M.S. *Mercury* and are distributed on a need to know basis.

452. Passing percentages for Reserve Tactical Communication ratings

SUBJECT										T.O.2	L.T.O.	C. %
General communication instructions	..	..	..	..	..	..	..	..	..	75 Oral	80	80
Fleetwork	..	..	..	..	..	..	..	..	..		80	80
Miscellaneous	..	..	..	..	..	..	..	..	..		—	—
Radio communication organisation	..	..	..	..	..	..	..	..	..	75	80	80
A.T. procedure—practical	..	..	..	..	..	..	..	..	..	—	80	80
A.T. procedure—paper	..	..	..	..	..	..	..	..	..	—		80
VS procedure paper	..	..	..	..	..	..	..	..	..	75	80	80
VS procedure—practical	..	..	..	..	..	..	..	..	..	75	80	80
Voice operating—practical	..	..	..	..	..	..	..	..	..	—	70	75
Radio technical—practical	..	..	..	..	..	..	..	..	..	80	80	80
Cryptography	..	..	..	..	..	..	..	..	..	10	10	10
Flashing reception	..	..	..	..	..	..	..	..	..	94	96	96
										8 15	8 15	8 15
Semaphore reception	..	..	..	..	..	..	..	..	..	72 94	96	96
										10	10	10
Flashing transmission	..	..	..	..	..	..	..	..	..	80	85	90
										8 15	8 15	8 15
Semaphore transmission	..	..	..	..	..	..	..	..	..	80	85	90
										30	30	30
Keyboard operating	..	..	..	..	..	..	..	..	..	94	94	94
Typing layout	..	..	..	..	..	..	..	..	..	94	—	—

Notes.— (i) Where subjects are bracketed together the examination is a combined one.

(ii) Operators 3rd Class who achieve 20/94 or over, but under 30/94 in BKX in examination for Operator 2nd class may be considered passed for acting Operator 2nd class.

453. Passing percentages for Reserve Radio Communication ratings

SUBJECT	R.O.2	L.R.O.	R.S.
General communication instructions	75	80	80
Radio communication organisation	Oral	80	80
A.T. procedure—practical	75	80	80
A.T. procedure—paper	—	80	80
W/T procedure—paper	—	80	80
W/T procedure—practical	75	80	80
Voice operating—practical	75	80	80
Radio technical—practical	—	70	75
Morse manuscript reception	18	18	18
Morse transmission	80	85	90
Keyboard operating	30	30	30
Keyboard operating	94	94	94
MORSE KEYBOARD RECEPTION	22/94	22/94	22/94

Notes.— (i) Where subjects are bracketed together the examination is a combined one.

(ii) Operators 3rd class who achieve 20/94 or over but under 30/94 in BKX, or 18/94 or over but under 22/94 in MMX, in the examination for Operator 2nd class, may be considered passed for Acting Operator 2nd class.

454. Passing percentages for Reserve Radio Special ratings

SUBJECT											R.O. (s).2	L.R.O. (s)	R.S.(s)
E.W. organisation	..	..	..	..	..	..	..	..	..	..	75	80	80
E.W. procedure—practical	..	..	..	..	..	..	..	..	..	..	75	80	80
E.W. technical—practical	..	..	..	..	..	..	..	..	..	..	75	80	80
General communication instructions	..	..	..	..	..	..	..	..	..	..	—	70	75
Radio organisation	..	..	..	..	..	..	..	..	..	..	75	75	75
W/T procedure—paper	..	..	..	..	..	..	..	..	..	..	75	75	75
W/T procedure—practical	..	..	..	..	..	..	..	..	..	..	75	80	80
Voice operating—practical	..	..	..	..	..	..	..	..	..	..	75	80	80
Special morse reception	..	..	..	..	..	..	..	..	..	..	25	25	25
											94	96	96
Morse transmission	..	..	..	..	..	..	..	..	..	..	18	18	18
											80	85	90

Note.—Where subjects are bracketed together the examination is a combined one.

455. General communication instructions

Standards

- A Thorough knowledge and ability to look up references quickly.
- B Good knowledge and general idea of where references are to be found.
- C Knowledge of principles only. A general idea of which books contain the necessary information.

SUBJECT	T.O.2	L.T.O.	C.V.	R.O.2	L.R.O.	R.S.	R.O.(s)2	L.R.O.(s)	R.S.(s)
PRINCIPLES OF NAVAL COMMUNICATIONS									
Instructions on reticence and responsibility of communications personnel.	A	A	A	A	A	A	A	A	A
Standard phraseology and phonetic alphabet	A	A	A	A	A	A	A	A	A
Means of communication	B	A	A	A	A	A	A	A	A
Use of precedences	A	A	A	A	A	A	A	A	A
Plaindress and codress	A	A	A	A	A	A	B	A	A
COMMUNICATIONS SECURITY									
Physical, transmission, and cryptographic security. Their inter-relationship.	B	B	A	C	B	A	C	B	A
Security of land lines	B	B	A	B	B	A	B	B	A
Transmission security	C	A	A	C	A	A	C	A	A
Physical security } included in Crypto instructions (see Crypto security } <i>Cryptographic operating instructions</i>)									
MESSAGE ORIGATION									
Originators' responsibilities	B	A	A	B	A	A	B	A	A
Security classification	A	A	A	A	A	A	A	A	A
Drafting the text	C	B	A	B	B	A	C	B	A
Use of special prefixes and message instructions	B	A	A	B	A	A	B	A	A
MINIMISE	C	B	A	C	B	A	C	B	A
Use of codeword CLEAR	—	C	B	—	C	B	—	C	B
ROUTEING AND PREPARING MESSAGES FOR DESPATCH									
Naval messages	B	A	A	B	A	A	B	B	B
Commercial messages	C	B	A	C	B	A	C	B	B
Use of Routeing Directory	C	B	A	C	B	A	C	B	B
Hand messages	B	A	A	B	A	A	B	B	B
Airgrams and postgrams	B	A	A	B	A	A	B	B	B
MESSAGE HANDLING IN SHIPS									
Layout of offices	B	A	A	B	A	A	B	B	B
OUT messages	B	A	A	B	A	A	C	C	C
IN messages	B	A	A	B	A	A	C	C	C
THROUGH messages	B	A	A	B	A	A	C	C	C
Distribution systems	B	A	A	B	A	A	C	C	C
Files, checks and records	B	A	A	B	A	A	C	C	C
MESSAGE HANDLING ASHORE									
Layout of offices	—	—	C	—	—	C	—	—	—
OUT messages	—	—	C	—	—	C	—	—	—
IN messages	—	—	C	—	—	C	—	—	—
THROUGH messages	—	—	C	—	—	C	—	—	—
Distribution systems	—	—	C	—	—	C	—	—	—
Files, checks and records	—	—	C	—	—	C	—	—	—
Special arrangements at large shore headquarters and shore radio stations.	—	—	C	—	—	C	—	—	—
Hand message organisation at a base	C	C	B	C	C	B	—	C	C
Basegrams	C	C	B	C	C	B	—	C	C

455. General communication instructions—continued

SUBJECT	T.O.2	L.T.O.	C.V.	R.O.2	L.R.O.	R.S.	R.O.(s)/2	L.R.O. (s)	R.S.(s)
GENERAL MESSAGES									
Definitions	C	B	A	C	B	A	C	B	B
Admiralty general messages	C	B	A	C	B	A	C	B	B
Station, squadron and local general messages	C	B	A	C	B	A	C	B	B
Navigational general messages—peace	C	B	B	C	B	B	C	B	B
Navigational general messages—war	—	—	C	—	—	C	—	—	C
Address indicating groups	B	A	A	B	A	A	B	B	B
Allied general messages	—	—	C	—	—	C	—	—	—
RADIO TELEGRAMS									
Types of commercial radio telegrams	C	B	B	C	B	A	C	C	C
Private messages between H.M. ships	C	B	B	C	B	A	C	C	C
Routing and delivery	—	C	C	—	B	A	—	—	—
Accounting	—	C	C	—	C	B	—	—	—
SPECIAL MESSAGES									
LOGREQ messages	—	C	B	—	C	B	—	C	C
RAINBOW messages	C	C	B	C	C	B	C	C	C
Movement reporting messages	—	—	C	—	—	C	—	—	—
Naval control of shipping messages	—	—	C	—	—	C	—	—	—
PUBLICATIONS									
Relationships of communication and tactical publications ..	C	B	B	C	B	B	C	B	B
Station communication orders	C	B	B	C	B	B	C	B	B
Operation orders	—	—	—	—	—	—	—	—	—
Ship's communication orders	B	B	B	B	B	B	B	B	B
A.F.O. 'S' series	B	A	A	B	A	A	B	B	B
Corrections to publications. How promulgated. Responsibility for inserting.	C	B	A	C	B	A	C	B	A
COMMAND STRUCTURE									
R.N. Command structure—Admiralty, Commanders-in-Chief and Flag Officers.	C	B	B	C	B	B	C	C	C
Organisation of the Admiralty and Whitehall M.S.O. ..	—	C	B	—	C	B	—	C	C
Allied Command structure. CAN/UK/US, NATO and SEATO.	C	C	B	C	C	B	C	C	C
British Joint Services Staff structure. Joint Chief of Staff. B.J.C.E.B.	—	—	—	—	—	—	—	—	—

456. Fleetwork

Standards

- A* A complete knowledge of the subject. Every detail must be known and thoroughly understood (e.g., knowledge required instantly without reference to any book).
- A A complete understanding of the subject. The exact details need not be known by heart (e.g., the type of manoeuvre which should be fully understood but for which reference to the books to check details would normally be expected).
- B Knowledge of the essential points of the subject but not the ability to go into details (e.g., the type of manoeuvre which should be understood with the aid of the book).
- C Knowledge of the existence of the subject, the purpose of it and where to look up further details if required.

SUBJECT	R.O.2	L.T.O.	C.Y.
GENERAL			
Relationship and function of all signal books	C	B	A
A.N.S.B. instructions. A.N.S.B., Chapter 1	C	B	A
Colours and meanings of flags and pennants. A.N.S.B., Chapter 2	A	A*	A*
Emergency signals. A.N.S.B., Chapter 3	A	A	A
Remaining chapters and tables of A.N.S.B., including Inter-R.N. Supplement	C	B	A
Layout of A.N.M.I.	C	B	A
VISUAL CALLSIGNS			
A.C.P. 118, B.R. 70, A.C.P. 113, A.C.P. 165, Section ii and Type Indicators	C	B	A
PRINCIPAL DEFINITIONS			
A.N.M.I., Chapter 1, plus Articles 421, 422, 501-504	C	B	A
ORGANISATION AND COMMAND. A.N.M.I., CHAPTER 2			
Fleet organisation	—	B	A
Command and mission relationships during support operations	—	—	—
Command functions	—	—	—
LEAVING AND ENTERING HARBOUR. A.N.M.I., CHAPTER 3	—	C	B
POSITION, COURSE AND SPEED. A.N.M.I., CHAPTER 4			
Position	C	B	A
Course and speed	—	C	B
P.I.M.	—	—	C
PRINCIPAL RULES FOR MANOEUVRING. A.N.M.I., CHAPTER 5			
Distances	B	A	A
Turning distances	—	C	A
Guide and pivot	—	B	A
Special manoeuvring rules	—	B	A
Stationing	—	B	A
Man overboard	—	B	A
Breakdown at sea	—	B	A
Night and fog	—	—	—
Wartime cruising precautions	—	—	—
FORMATIONS AND DISPOSITIONS. A.N.M.I., CHAPTER 6			
Single and multiple line formations	B	A	A
Circular formations	—	B	A
Operational formations and dispositions	—	C	C
Typical operational formations	—	C	C
Carrier formations	—	C	C
Typical operational dispositions	—	C	C
ALTERING COURSE. A.N.M.I., CHAPTER 7			
Turning together	A	A	A
Wheeling	A	A	A
Special methods for altering course	—	B	A

456. Fleetwork—continued

SUBJECT										T.O.2	L.T.O.	C.Y.
SURFACE SCREENS. A.N.M.I., CHAPTER 8												
Fundamentals	..	..	..	..	..	..	..	..	..	C	B	A
Rules for various types of screens	..	..	..	..	..	..	..	..	..	—	B	A
Altering course	..	..	..	..	..	..	..	..	..	—	A	A
Special instructions for A/S screens	..	..	..	..	..	..	..	..	..	—	B	A
Departure and entry	..	..	..	..	..	..	..	..	..	—	C	C
Smoke screens	..	..	..	..	..	..	..	..	..	—	—	C
Asymmetrical screens for damaged ships	..	..	..	..	..	..	..	..	..	—	—	—
Use of Table 'C'	..	..	..	..	..	..	..	..	..	—	B	A
Anti-aircraft screens..	..	..	..	..	..	..	..	..	..	—	—	—
A/S EVASIVE STEERING. A.T.P. 3												
Terminology	..	..	..	..	..	..	..	..	..	—	B	A
Explanation of basic principles	..	..	..	..	..	..	..	..	..	—	—	C
Doctrine	..	..	..	..	..	..	..	..	..	—	—	C
Method of execution	..	..	..	..	..	..	..	..	..	—	B	A
Tables 'A', 'B' and 'C'	..	..	..	..	..	..	..	..	..	—	—	B
Table 'D'	..	..	..	..	..	..	..	..	..	—	—	C
Table 'E'	..	..	..	..	..	..	..	..	..	—	—	A
Zig-zag plans	..	..	..	..	..	..	..	..	..	—	B	A
EXERCISE SIGNALS. A.N.S.B., CHAPTER 20										..	C	B
FLAG SIGNALS FOR USE IN SUBMARINE AND A/S EXERCISES. A.N.S.B., CHAPTER 20										..	—	C

457. Miscellaneous

Standards

- A Thorough knowledge and ability to look up references quickly.
 B Good knowledge and general idea of where references are to be found.
 C Knowledge of principles only. A general idea of which books contain the necessary information.

SUBJECT	T.O.2	L.T.O.	C.Y.
OPERATING SIGNALS			
Signals in common use	B	A	A
M.S.B. (B.R. 98(3))			
Chapters 1, 2, 3, 4. Knowledge as for the appropriate sections of A.C.P.s 118, 125, 129, 175, from which they have been extracted, except:—	—	—	C
Chapter 4. Articles 404, 405—wireless callsigns	—	—	C
Chapter 2. Article 224—signalling depths	—	—	C
Chapter 5. Special instructions for craft and boats	—	—	C
Chapter 6. Manoeuvring of minor landing craft	—	—	C
Chapter 7. R.N. phrase section	—	—	C
INTCO VOL. I (B.R. 69(1))			
Appendix 'A'—distress signals	—	C	B
W.I.M.S. VOL. I (A.C.P.148)			
Flag signalling (Articles 1101–1104, 1111, 1141, 1142)	—	C	C
Flashing procedure (Articles 1201–1221)	—	—	C
Remainder of Chapter 13	—	—	C
A.M.M.I. (A.T.P. 19)			
Conduct of minesweeping	—	—	C
Examples of sweeping formations	—	—	C
Signals displayed when sweeping	—	C	B
Night minesweeping	—	—	C
L Corpen, G Corpen	—	—	C
DRILL SIGNAL TABLE (B.R. 88(2))			
.. .. .	—	C	C
SIGNAL LETTERS OF BRITISH SHIPS (B.R. 70)			
Introduction	—	C	C
Gale warning service	—	C	C
Remainder of book	—	—	C
MANUAL OF SEAMANSHIP VOLS. I AND II (B.R. 67)			
Buoyage and lights	—	C	B
Rule of the road	—	C	B
Sound signals	—	C	B
Lights	—	C	B
RECOGNITION. GENERAL INSTRUCTIONS (A.C.P. 150)			
Transmitting a VS recognition signal (Article 108(c))	C	B	A
Means and method (Article 109)	—	C	B
I.F.F. (Chapter 3)	—	—	C
Key lists (Chapter 4)	—	—	C
INSTRUCTIONS FOR AIR AND GROUND FORCES (A.C.P. 151)			
Recognition by appearance (Articles 303, 304)	—	C	B
Visual methods (Article 307)	—	C	C
INSTRUCTIONS FOR SURFACE FORCES (A.C.P. 153)			
Challenging and identifying (Chapter 2)	C	B	A
Recognition of merchant ships (Chapter 3)	—	—	C
Recognition of submarines (Chapter 4)	—	—	C
Key lists	—	—	C
HARBOUR ENTRANCE CONTROL (A.C.P. 154)			
.. .. .	—	—	C

457. Miscellaneous—continued

SUBJECT	T.O.2	L.T.O.	C.Y.
VS HANDBOOK (B.R. 1971)			
Signalling projectors and lanterns (Chapter 1)	C	C	C
Miscellaneous lights (Chapter 2)	C	C	C
Notes on VS stores (Chapter 4)	—	C	B
Care of stores, office machinery and signal flags (Chapters 5-7)	C	B	B
Hints to signalmen (Chapter 11)	B	A	A
COLOURS (<i>Q.R. & I.A.</i>)			
Wearing by ships in commission (Articles 1232, 1233)	C	B	A
Hoisting and hauling down and ceremony (Articles 1236, 1359, 1360)	B	A	A
Half-masting { Article 1239, Clause 1	C	B	B
Article 1239, Clauses 2-9	—	C	C
Lowering flags (Article 1238)	C	B	A
Masthead pendant (Article 1210)	C	B	A
Courts-martial (Article 1243)	—	—	C
Boats ensign (Article 1271)	—	B	A
DRESSING SHIP (Article 1240)	—	B	A
FLAGS IN BOATS, AIRCRAFT AND ON CARS			
Boats. Flags, pendants and discs (Articles 1273, 1274, 1277, 1278)	C	B	A
Chief of Staff and Captain of the Fleet (Article 1275)	—	B	A
Queen's Harbour Master (Article 1276)	—	C	B
CEREMONIAL FOR SHIPS PASSING (Articles 1325, 1326)	C	C	B
GENERAL			
PRINCIPAL NATIONAL FLAGS AND ENSIGNS (List 1)	C	B	A
PRINCIPAL STEAMSHIP COMPANY HOUSE FLAGS AND FUNNELS.. .. .	—	—	C
INTERNAL ORGANISATION OF VS DEPARTMENT	C	B	A

458. Radio communication organisation

Standards

- A Thorough knowledge and ability to look up references quickly.
 B Good knowledge and general idea of where references are to be found.
 C Knowledge of principles only. A general idea of which books contain the necessary information.

SUBJECT	T.O.2	L.T.O.	C.Y.	R.O.2	L.R.O.	R.S.	R.O.(s)2	L.R.O.(s)	R.S.(s)
GENERAL									
Radio tree. Systems of transmission	C	C	C	C	A	A	C	B	A
Propagation of radio waves	C	C	C	C	B	A	C	B	A
Frequency allocation	—	—	—	—	—	A	—	—	B
Frequency predictions	—	—	—	—	—	A	—	—	B
STRATEGIC COMMUNICATIONS									
Naval shore radio stations	C	C	C	C	A	A	—	C	B
Fixed services	—	—	—	—	—	A	—	—	—
Shore broadcasts and nets	—	—	—	—	—	—	—	—	—
Use of commercial facilities	—	—	—	—	—	—	—	—	—
SHIP BROADCASTS									
Radio communication areas	C	B	B	C	A	A	C	B	B
Types of broadcasts	—	C	C	C	B	A	—	B	B
Single and two operator periods	—	C	C	C	A	A	C	B	B
Broadcast schedules	—	—	—	—	A	A	—	—	C
Broadcast serial numbers	C	C	C	C	A	A	C	B	B
SHIP-SHORE									
Watch kept by shore stations	—	C	C	C	A	A	—	C	B
Procedure and organisation—peace	—	C	C	C	A	A	—	—	B
Procedure and organisation—war	—	C	C	C	A	A	—	B	B
Use of S7	—	—	—	—	—	—	—	—	—
LOCAL COMMUNICATIONS									
Coastal Command common net	C	C	C	C	A	A	C	B	B
Command and operational nets	—	C	C	C	B	B	—	C	B
Ship-N.A.S. nets	—	C	C	C	A	A	—	C	B
Exercise nets	—	—	—	—	—	—	—	—	—
PASSAGE COMMUNICATIONS									
Watch kept by ships on passage	C	B	B	C	A	A	C	B	B
500 Kcs.	—	C	C	—	A	A	—	—	—
Sailing signals	—	—	C	—	C	B	—	—	—
Daily position reports	—	—	—	—	C	—	—	—	—
HARBOUR COMMUNICATIONS									
Watch kept by ships in harbour	C	B	B	C	A	A	C	B	B
Harbour communication nets	—	C	C	C	C	B	—	C	B
Other harbour communication facilities	—	—	C	—	C	B	—	—	—
Harbour communication drills	—	—	C	—	—	—	—	—	—
Wartime harbour communications	—	—	—	—	—	—	—	—	—
TACTICAL COMMUNICATIONS									
Carrier task force—surface nets	C	C	C	C	B	A	B	B	B
Carrier task force—air nets	—	C	—	C	C	B	—	—	C
Convoy communications	—	—	C	C	C	B	—	—	C
Maritime air communications	—	—	C	C	C	A	C	B	B
Radio communication guards	—	—	—	—	—	—	—	—	—

458. Radio communication organisation—continued

SUBJECT	T.O.2	L.T.O.	C.Y.	R.O.2	L.R.O.	R.S.	R.O.(s) ²	L.R.O. (s)	R.S.(s)
MERCHANT SHIP COMMUNICATIONS									
Long distance organisation	—	—	C	—	C	B	—	—	—
Short distance organisation	—	—	C	—	C	B	—	—	—
G.B.M.S. organisation	—	—	C	—	C	B	—	—	—
MERCAST organisation	—	—	C	—	C	B	—	—	—
SUBMARINE COMMUNICATIONS									
Submarine broadcasts	—	—	C	—	C	B	—	—	—
Submerged reception	—	—	C	—	C	B	—	—	—
Submarine safety net	—	—	C	—	C	B	—	—	—
Communications for A/S exercises	—	—	C	—	C	B	—	—	—
Diving and surfacing signals	—	—	C	—	C	C	—	—	—
Check reports	—	—	C	—	C	C	—	—	—
SAFETY COMMUNICATIONS									
Acknowledgment of distress messages	C	B	A	B	A	A	A	A	—
Distress organisation—ships	C	C	C	C	C	B	C	C	—
Distress organisation—aircraft	C	C	C	C	C	B	C	C	—
Search and rescue organisation	—	C	C	—	C	B	—	—	—
Submiss/subsunk organisation	—	C	C	C	C	B	—	C	—
Emergency communications between diplomatic posts and H.M. ships.	—	—	—	—	—	C	—	—	—
METEOROLOGICAL COMMUNICATIONS									
Weather forecasts	—	C	C	—	B	A	—	—	—
Storm warnings	—	C	C	—	B	A	—	—	—
Weather reports from ships	—	—	C	—	B	B	—	—	—
Synoptic messages	—	—	—	—	C	B	—	—	—
Meteorological broadcasts	—	—	—	—	C	B	—	—	—
Use of facsimile in ships	—	—	—	—	—	C	—	—	—
NAVAL AIR COMMUNICATIONS									
Carriage and use of radio by aircraft	—	—	—	C	B	A	—	—	—
Flights from aircraft carriers	—	—	—	—	C	B	—	C	—
Ship-air exercises	C	—	—	C	B	A	—	—	—
A.T.C. and airfield organisation	—	—	—	—	—	C	—	—	—
Use of S4	—	—	—	C	C	B	—	—	—
U/VHF communication circuits	—	—	—	—	—	C	—	—	—
HF communication circuits	—	—	—	—	—	C	—	—	—
Radionavigational aids	—	—	—	—	—	C	—	—	—
Use of R.A.F.A.Cs.	—	—	—	—	C	B	—	—	—
MISCELLANEOUS COMMUNICATIONS									
Naval gunfire support communications	—	—	C	—	C	C	—	—	—
Amphibious warfare communications	—	—	C	—	—	C	—	—	—
Minesweeping and minecountermeasures communications	—	—	—	—	—	C	—	—	—
Coastal Force communications	—	—	—	—	—	C	—	—	—
Allied communication organisation	—	—	—	—	—	C	—	—	—
Press communications	—	—	C	—	—	B	—	—	—
ENEMY CONTACT REPORTING									
Types of reports	C	C	B	C	B	B	C	B	B
What, where, whither, when	C	C	B	C	B	A	C	B	B
Precedence of reports	—	C	B	—	B	A	—	C	B
Merchant ship reports	—	—	C	C	C	B	—	—	C
A.I.O. reports	—	—	—	—	—	C	C	B	B
PUBLICATIONS									
Admiralty list of radio signals	—	—	C	—	C	B	—	—	—
International Radio Regulations (B.R. 736)	—	—	—	—	—	C	—	—	—
P.M.G.'s handbook	—	—	—	—	C	B	—	—	—

458. Radio Communication organisation—*continued*

SUBJECT	T.O.2	L.T.O.	C.Y.	R.O.2	L.R.O.	R.S.	R.O.(s) ²	L.R.O. (s)	R.S. (s)
INTERNAL ORGANISATION									
Organisation of the wireless department	—	—	—	C	B	B	C	B	B
ELECTRONIC EMISSION POLICY									
Electronic silence	—	C	C	—	B	B	C	B	A
Imposing, relaxing and breaking silence	—	C	C	—	B	B	—	C	B
Standard occasions for breaking silence	—	—	—	—	—	—	—	—	—
Factors in choice of electronic emission policy	—	—	—	—	—	—	—	—	—
Promulgation of E.E. policy	—	—	—	—	—	C	—	—	C
Implementation onboard ship	—	—	—	—	—	C	—	—	B

459. Radio communication technical

Standards of Knowledge

EQUIPMENT		OTHER SUBJECTS	
OPERATION OF EQUIPMENT			
	(i) Characteristics of equipment. (ii) Component parts covered. (iii) Ability to obtain 'A' Knowledge by study of relevant handbooks.		
A	The ability to tune rapidly and efficiently without the aid of tuning guides, to operate, and to recognise a major failure or reduction in performance.	(i) A full knowledge. (ii) A good knowledge of functions, principles of operation and circuitry associated with the operation of user controls. (iii) N.A.	A thorough knowledge and the ability to look up references quickly.
B	The ability to tune rapidly and efficiently without the aid of tuning guides, to operate, and to recognise a major failure or reduction in performance.	(i) A full knowledge. (ii) Knowledge of the functions and principles of operation associated with the operation of user controls (iii) Yes.	A good knowledge and a general idea of where references are to be found.
C	The ability to tune and operate efficiently with the aid of tuning guides.	(i) General knowledge. (ii) Knowledge of the function. (iii) Yes.	Knowledge of principles only. General idea of where references are to be found.
D	—	(i) General knowledge. (ii) Knowledge of the function. (iii) Yes.	A general knowledge confined to principles.

Note: The use of tuning guides applies to transmitters only.

EQUIPMENT

	ALL TACTICAL COMMUNICATION RATINGS	R.O.2	L.R.O.	R.S.
(A) TRANSMITTERS				
89Q or 603 (Equipment <i>not</i> fitted at own H.Q.)				
89Q				
Frequency range. Emission and power output	—	—	A	A
General description	—	—	C	B
Front panel controls	—	—	A	A
Tuning and operating	—	—	B	B
603				
Frequency range. Emission and power output	—	—	A	A
General description	—	—	C	B
Front panel controls	—	—	A	A
Tuning and operating	—	—	B	B
618/619				
Frequency range. Emission and power output	—	A	A	A
Power pack. General description	—	D	C	B
Controls	—	D	A	A
HF and MF Transmitters. General description	—	D	C	B
Front panel controls	—	D	A	A
Frequency build up	—	D	A	A
Tuning and operating	—	D	B	B
633				
Frequency range. Emission and power output	—	—	B	B
General description. Controls. Operating and Tuning	—	—	C	B
692/693				
Frequency range. Emission and power output	—	—	A	A
General description	—	—	C	B
FCU General description	—	—	C	B
Modulator general description	—	—	C	B
Front panel controls	—	—	A	A
Operating instructions	—	—	B	B
693				
R.F. Power Amplifier—Power unit—General description	—	—	C	B
R.F. Power Amplifier—General description	—	—	C	B
(B) RECEIVERS				
CAS/CAT				
Frequency range	—	A	A	A
Brief technical description	—	D	C	B
Front panel controls	—	D	C	B
CUJ				
Frequency range	—	—	A	A
General description	—	—	C	B
Front panel controls	—	—	A	A
(C) D/F				
FM12				
Frequency range	—	A	A	A
General description. Operating instructions	—	C	B	B
Receiver controls. Taking a bearing	—	C	A	A
FU1				
General description	—	—	C	B
Operating instructions. Taking a bearing	—	—	C	B
(D) RATT				
RATT operation. Technique employed	C	C	B	B
Types of RATT bay	C	C	B	B
Two-tone operation	C	C	B	B

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B.R. 1792

RESTRICTED

Change No. 1

EQUIPMENT

	ALL TACTICAL COMMUNICATION RATINGS	R.O. 2	L.R.O.	R.S.
(D) RATT— <i>continued</i>				
Terminal set:—General description	—	C	B	B
Block diagram	—	C	B	B
Operating instructions	C	C	B	B
F.S.K. Reception:—				
Convertor/Comparator:—General description	C	C	B	B
Block diagram	C	C	B	B
Operating instructions	C	C	B	B
Adjacent channel interference	C	C	C	B
F.S.K. Transmission:—				
GK 185A:—General description	—	C	B	B
Block diagram, tuning and operating	—	C	B	B
Facilities available in RATT (2)	—	C	B	B
Differences between RATT (1) and RATT (2)	—	C	B	B
(E) KHF				
KH Series:—General description	—	—	C	B
Types of control units	—	—	C	B
Facilities provided by control units	—	—	C	B
(F) PORTABLES				
Scale of allowances	—	—	C	C
615				
Frequency range	C	C	C	C
Operation	C	C	B	B
622				
Frequency range. Emission	C	C	B	B
General description. Tuning and operating	C	C	C	B
629				
Frequency	A	A	A	A
Brief description	C	C	C	B
Operation	C	C	B	B
(G) MISCELLANEOUS				
Power supplies A.C. and D.C. ships	—	—	C	C
Layouts—Destroyer and Frigate	—	—	C	C
Interference—Accuracy of transmitter/receiver adjustments	—	—	C	C
Testing and tuning. Nomenclature	—	—	C	C

Note: Transceivers Type 691/CUH and Type 86M to be studied in own H.Q.

460. W/T procedure

Standards

- A Thorough knowledge and good practical ability.
- B Good knowledge and fair practical ability.
- C Knowledge of principles and fair practical ability under supervision.

SUBJECT	R.O.2	L.R.O.	R.S.	R.O.(S)2	L.R.O. (S)	R.S.(S)
Layout of A.C.P. 124	B	A	A	B	A	A
Instructions to operators	B	A	A	B	A	A
Transmitting techniques	B	A	A	B	A	A
Reasons for procedure	B	A	A	B	A	A
Prosigns and meanings	A	A	A	A	A	A
Types of messages	A	A	A	A	A	A
Basic message format	A	A	A	A	A	A
Calling and answering	A	A	A	A	A	A
Signal strength and readability	A	A	A	A	A	A
Transmission identification	B	A	A	B	A	A
Transmission instructions	A	A	A	A	A	A
Precedence, single	A	A	A	A	A	A
Precedence, dual	B	A	A	B	A	A
Message instructions	B	A	A	B	B	A
Message address	A	A	A	A	A	A
Prefix	A	A	A	A	A	A
Final instructions, message ending	A	A	A	A	A	A
Transmission of long messages	B	A	A	B	A	A
Counting and checking groups	B	A	A	B	A	A
Identifications, repetitions, verifications, corrections	B	A	A	B	A	A
Check of reception	B	A	A	B	A	A
Words twice	B	A	A	B	A	A
Break in procedure	B	A	A	B	A	A
Test signals and tuning	C	B	A	C	B	A
Emergency silence	C	B	A	C	B	A
Timing signals	B	A	A	B	A	A
Re-addressing messages	—	B	B	—	B	B
Radio guards	C	B	B	C	B	B
Messages in strings	—	B	B	—	B	B
Refiling and re-processing messages	—	C	B	—	C	B
Ending of air/ground communications	B	A	A	B	A	A
Executive method	B	A	A	B	A	A
Broadcast procedure	B	A	A	B	A	A
'I' Method procedure	C	C	A	C	C	A
Ship-Shore procedure	B	C	A	B	C	A
Enemy contact reporting procedure	B	B	A	B	B	A
D.F. procedure	—	C	B	—	C	B
Commercial procedure	C	C	B	C	C	B
T.R. Procedure	—	C	B	—	C	B
Radio telegrams—procedure	C	B	B	—	—	C
Paid and unpaid service advices	—	C	B	—	—	C
Merchant ship broadcast procedure	—	—	B	—	—	C
Distress, urgency and safety prosigns	C	B	A	C	B	C
Distress, urgency and safety procedure	—	B	B	—	—	C
Homing procedures	—	C	B	—	—	B
I.C.A.O. procedure	—	—	—	—	—	—
Naval gun support procedure	—	—	C	—	—	C
Use of A.C.P. 131	A	A	A	A	A	A

461. Voice operating

Standards

- A Thorough knowledge and good practical ability.
- B Good knowledge and fair practical ability.
- C Knowledge of principles and where to look up details.

SUBJECT	T.O. 2	L.T.O.	C.Y.	R.O. 2	L.R.O.	R.S.	R.O. (S) 2	L.R.O. (S)	R.S. (S)
Voice technique	A	A	A	A	A	A	A	A	A
General instructions to operators	A	A	A	A	A	A	A	A	A
Basic message format	A	A	A	B	A	A	B	A	A
Types of message	A	A	A	B	A	A	B	A	A
Operating rules	A	A	A	B	B	A	C	B	A
Executive method	A	A	A	B	A	A	B	A	A
Abbreviated procedure	B	A	A	B	A	A	B	A	A
Enemy reporting	B	B	A	B	C	A	B	B	A
Internal reporting	—	—	—	—	—	—	—	—	—
International procedures	—	—	—	—	—	—	—	—	—
Air procedure	—	—	—	—	—	—	—	—	—
Procedure used on AIO nets	A	A	A	A	A	A	A	A	A
Alarm Reports									

462. VS procedure

Standards

- A Very high standard of knowledge and practical ability in every detail.
- B A good knowledge of the main principles and good practical ability.
- C A knowledge of the main principles of the subject and practical ability under supervision.

SUBJECT	T.O.S.	I.F.O.	C.V.
INTRODUCTION. A.C.P. 129, CHAPTER 1			
General	A	A	A
Message forms	B	A	A
Schematic diagram	B	A	A
OPERATING SIGNALS AND PROSIGNS. A.C.P. 129, CHAPTER 2			
General	B	A	A
Description and use of prosigns	B	A	A
VISUAL PROCEDURE. A.C.P. 129, CHAPTER 3			
General	B	B	A
Use of precedence prosigns	B	A	A
Group count	—	—	C
Message address	B	A	A
Identification, corrections, verifications and cancellations	C	B	A
Acknowledgments	C	B	A
Rules for refileing messages	C	B	A
VISUAL RESPONSIBILITY. A.C.P. 129, CHAPTER 4	—	C	B
FLASHING LIGHT. A.C.P. 129, CHAPTER 5	B	B	A
SEMAPHORE. A.C.P. 129, CHAPTER 6	C	B	A
FLAGHOIST. A.C.P. 129, CHAPTER 7	C	B	A
MISCELLANEOUS SYSTEMS. A.C.P. 129, CHAPTER 8			
Pyrotechnics	A	A	A
Sound	—	C	C
R.N. SUPPLEMENT No. 1 TO A.C.P. 129			
Introduction	—	B	B
A.C.P. sections not for use intra-R.N.	—	B	B
Anglo-U.S. equivalent terms	—	B	B
Amplification of certain parts	—	B	A
Hoisting callsigns	C	B	A
Attracting attention	C	B	A
Visual responsibilities at sea	—	B	B
All ship messages not originated by O.T.C.	C	B	B
Transmission instructions	C	B	B

463. Automatic telegraphy procedure

Standards

- A Good knowledge and good practical ability.
- B Good knowledge and fair practical ability.
- C Knowledge of principles and fair practical ability under supervision.

SUBJECT	T.O.2	L.T.O.	C.Y.	R.O.2	L.R.O.	R.S.
Teleprinter 7B	—	—	—	—	—	B
Teleprinter 28	C	B	A	C	B	A
Teleprinter 28. Transmission functions	B	A	A	B	A	A
Teleprinter 12	C	B	A	C	B	A
Teleprinter 12. Transmission functions	B	A	A	B	A	A
Associated teleprinter equipment	—	—	—	—	C	B
Murray Code—Recognition of ZCZC, space and letter shifts	—	—	—	—	—	A
Definitions used in tape relay	—	—	—	—	—	A
Worldwide tape relay network and Commonwealth section	—	—	—	—	—	A
Construction and use of routeing indicators	—	—	—	—	—	A
Basic message format	A	A	A	A	A	A
Preparation of messages for transmission, including multi-page and long messages	—	—	—	—	A	A
Confirmations, corrections and cancellations	—	—	—	—	A	A
Circuit continuity, out of touch, call and standard test tapes, discrepancies in channel numbers, responsibilities of receiving stations	—	—	—	—	—	C
Routeing in tape relay	—	—	—	—	—	A
Alternative routeing	—	—	—	—	—	B
Transfer between sections	—	—	—	—	—	B
Missent, misrouted and suspected duplicates, messages subject to correction	—	—	—	—	—	C
Receipts and repetitions on fixed services	—	—	—	—	—	C
Ship/RATT Simplex procedure	C	A	A	C	A	A
Ship/RATT Executive procedure	C	A	A	C	A	A
RATT broadcast procedure	C	A	A	C	A	A
RATT Ship/Shore procedure	—	—	—	C	A	A

464. Electronic warfare organisation

Standards

- A Thorough knowledge of the subject and a high practical standard.
 B Good knowledge of the subject and a reasonable practical ability.
 C Knowledge of the existence and the principles of the subject and where to look up details.

SUBJECT	R.O.(S) ²	L.R.O. (S)	R.S.(S)
BASIC PRINCIPLES			
Aim, scope and responsibility of E.W. branch	A	A	A
Terms used	C	B	B
Frequency spectrum, nomenclature and use	B	B	A
Propagation	C	B	B
Interception and D.F.	C	B	A
Basic radar acquaint	C	B	B
Radio location and analysis of electronic transmissions	C	B	B
Noises (communication)	B	B	B
Noises (non-communication)	B	B	B
Communications deception	—	—	—
Radar deception	—	—	—
Radar evasion	—	—	—
Communications security	B	B	A
Jamming, communications	C	C	C
Jamming, radar	—	—	—
Jamming, guided weapons	—	—	—
ORGANISATION AND PROCEDURE			
E.W. control	B	B	B
Organisation	B	B	B
Procedure, E.W. nets (W/T)	B	B	A
Procedure, E.W. nets (voice)	A	A	A
Triangulation	—	—	—
Codewords, starred	A	A	A
Codewords, unstarred	C	C	B
Plotting	—	C	B

465-489. Spare.

490. Standards of operating ability

SYSTEM	See NOTE BELOW	RELEVANT PRACTICAL EXERCISE	T.O.2	L.T.O.	C.Y.	R.O.2	L.R.O.	R.S.	R.O.(s)2	L.R.O. (s)	R.S.(s)
Flashing—reception	—	FRX	10 94	10 96	10 96	—	—	—	—	—	—
Flashing—transmission	—	FTX	10 80	10 85	10 90	—	—	—	—	—	—
Semaphore—reception	—	SRX	815 9294	815 96	815 96	—	—	—	—	—	—
Semaphore—transmission	—	STX	815 80	815 85	815 90	—	—	—	—	—	—
Radio morse—manuscript reception .. (i)	—	MMX	—	—	—	18 94	18 96	18 96	—	—	—
Radio morse—keyboard reception ..	—	MKX	—	—	—	22 94	22 96	22 96	—	—	—
Radio morse—transmission	—	MTX	—	—	—	18 80	18 85	18 90	18 80	18 85	18 90
Radio morse—special reception	—	MSX	—	—	—	—	—	—	25 94	25 96	25 96
Basic keyboard operating	(ii)	BKX	30 94	30 94	30 96	30 94	30 94	30 94	—	—	—
Typing layout	—	TLX	94	—	—	94	—	—	—	—	—

Notes.— (i) Operators 3rd class who achieve 18/94 or over but under 22/94 in MMX may be considered passed for Acting Operator 2nd class.

(ii) Operators 3rd class who achieve 20/94 or over but under 30/94 in BKX may be considered passed for Acting Operator 2nd class.

Chapter 5

W.R.N.S. AND W.R.N.R.

Section 1

ENTRY, INITIAL TRAINING AND DUTIES

501. General

a. This chapter contains information regarding the duties, entry, training and advancement of the communication categories in the W.R.N.S. and the W.R.N.R. which are as follows:—

(1) W.R.N.S.

Wren Radio Operator (M).
Wren Radio Operator.
Wren Switchboard Operator.

(2) W.R.N.R.

Wren Radio Operator (M).
Wren Radio Operator.

b. The information contained in this section regarding advancement is intended as a guide only. The advancement regulations, which must be consulted where a rating's advancement is concerned, are contained in B.R. 1077 for W.R.N.S., and Admiral Commanding Reserves Standing Orders (distributed to R.N.R. Training Centres only) for W.R.N.R.

502. Duties

The duties of the various rates in the W.R.N.S. communication categories are given below. The duties of the W.R.N.R. communication categories are similar, and have not been described separately.

503. Wren Radio Operator

a. A Wren Radio Operator will normally be employed on main signal or cryptographic office duties, or as an A.T. or voice operator.

b. A Wren Radio Operator will be required to have a good practical operating ability and knowledge of other subjects as follows:—

- (1) A good knowledge of voice and A.T. procedures.
- (2) A good knowledge of teleprinter switchboard operating.
- (3) A good knowledge of the Naval air safety organisation.
- (4) A fair knowledge of communication organisation.
- (5) A fair knowledge of cryptography.

504. Leading Wren Radio Operator

a. A Leading Wren Radio Operator will normally be employed as Leading Hand of the Watch in a shore main signal or cryptographic office, or as an operator on the more important A.T. circuits.

b. A Leading Wren Radio Operator will be required to have a good operating ability and the following knowledge:—

- (1) A thorough knowledge of A.T. and voice procedure.
- (2) A good knowledge of teleprinter switchboard operating.
- (3) A good knowledge of Naval air safety organisation.
- (4) A good knowledge of communication organisation.
- (5) A good knowledge of cryptography.

505. Petty Officer Wren Radio Supervisor

- a.* A Petty Officer Wren Radio Supervisor will normally be employed at large shore communication centres either in charge of Wren Radio Operators, or as Petty Officer of the Watch, or as a member of the secret cryptographic staff. She may also be employed as an instructor.
- b.* A Petty Officer Wren Radio Supervisor will be required to have good operating ability and a greater knowledge than a Leading Wren Radio Operator.

506. Chief Wren Radio Supervisor

- a.* A Chief Wren Radio Supervisor will normally be employed in charge of a watch in a shore communication centre, or as assistant to a Chief Communication Yeoman at stations with a large staff of W.R.N.S. personnel. She may also be in charge of the secret cryptographic office.
- b.* The standard of practical ability required is the same as for Petty Officer Wren Radio Supervisor. There is no course or examination for this rate.

507. Wren Radio Operator (M)

- a.* A Wren Radio Operator (M) will normally be employed as a wireless, voice or A.T. operator.
- b.* A Wren Radio Operator (M) will be required to have the same practical operating ability and knowledge as a Wren Radio Operator (*see* paragraph 503 *b*). In addition a Wren Radio Operator (M) will be required to have a good knowledge of wireless procedure, and ability to operate wireless receiving equipment.

508. Leading Wren Radio Operator (M)

- a.* A Leading Wren Radio Operator (M) will normally be employed as Leading Hand of the Watch in shore wireless stations, or as an operator on the more important W/T and A.T. circuits.
- b.* A Leading Wren Radio Operator (M) will be required to have the same practical operating ability and knowledge as a Leading Wren Radio Operator (*see* paragraph 504 *b*). In addition a Leading Wren Radio Operator (M) will be required to have a good operating ability and the following knowledge:—
- (1) Thorough knowledge of all forms of wireless, A.T. and voice procedure.
 - (2) Ability to operate wireless receiving and A.T. equipment and to have a good knowledge of control circuits.
 - (3) A detailed knowledge of the Naval air safety organisation.
 - (4) A good knowledge of communication organisation.

509. Petty Officer Wren Radio Supervisor (M)

- a.* A Petty Officer Wren Radio Supervisor (M) will normally be employed at large shore communication centres either in charge of Wren Radio Operators (M), or as a Petty Officer of the Watch. She may also be employed as an instructor.
- b.* A Petty Officer Wren Radio Supervisor (M) will be required to have a good operating ability and a greater knowledge than a Leading Wren Radio Operator (M).

510. Chief Wren Radio Supervisor (M)

- a.* A Chief Wren Radio Supervisor (M) will normally be employed in charge of a watch in a shore communication centre, or as an assistant to a Chief Radio Supervisor at stations with a large staff of W.R.N.S. personnel.

b. The standard of practical ability required is the same as for Petty Officer Wren Radio Supervisor (M). There is no course or examination for this rate.

511. Wren Switchboard Operator

a. A Wren Switchboard Operator will normally be employed in operating telephone switchboards, and will be required to have the following knowledge:—

- (1) A thorough knowledge of operating manual switchboards, including the booking of calls.
- (2) A good knowledge of Post Office working, routing of calls, and routine testing and fault reporting on simple switchboards.
- (3) A fair knowledge of the Supervisor's duties and of Admiralty Orders in connection with telephone operating.
- (4) A good knowledge of multiple and non-multiple P.B.X., the Naval network of trunk lines and miscellaneous Post Office services.

512. Leading Wren Switchboard Operator

a. A Leading Wren Switchboard Operator will normally be employed as the Supervisor on a switchboard, and will be required to have the following knowledge:—

- (1) A thorough knowledge of the routing of calls and of Post Office working.
- (2) A good knowledge of the Supervisor's duties on any type of switchboard.

b. There is no examination for this rate.

513. Petty Officer Wren Switchboard Operator

a. A Petty Officer Wren Switchboard Operator will normally be employed as the Supervisor of a large switchboard, and should be capable of taking charge of a switchboard room. She will be required to have the following knowledge:—

- (1) A thorough knowledge of multiple and non-multiple P.B.X., the Naval network of trunk lines, and miscellaneous Post Office services.
- (2) A thorough knowledge of B.R. 845.

b. There is no course or examination for this rate.

514. Chief Wren Switchboard Operator

a. A Chief Wren Switchboard Operator will normally be employed in a similar capacity to a Petty Officer Wren Switchboard Operator where the size of the W.R.N.S. complement and the duties of the rating in charge require the additional experience of a more senior rating.

b. There is no course or examination for this rate.

515. Initial training

a. W.R.N.S. new entries carry out their Part I training at H.M.S. *Dauntless*. Communications and Switchboard ratings join H.M.S. *Mercury* for their Part II training.

b. Ratings who prove unsuitable for these categories during Part II training may be discharged to H.M.S. *Dauntless* for recategorisation.

516. W.R.N.S. Radio Operators and Radio Operators (M) ratings

a. W.R.N.S. Radio Operator (M) ratings are instructed in accordance with the Part II syllabus for Wren Radio Operators, with the addition of training in morse.

b. Wren Radio Operators (M) will complete the same advancement courses as Wren Radio Operators.

c. There is one common roster for the Wren Radio Operators and Wren Radio Operators (M) categories. The basic date of each rating on this common roster is the basic date of passing professionally for Petty Officer Wren or Leading Wren Radio Operator or Radio Operator (M), as applicable, for the Petty Officer or Leading Rate roster, and the seniority as a Petty Officer Wren for the Chief Wren's roster.

517-520. Spare.

TRAINING AND ADVANCEMENT

521. Minimum qualifications necessary for advancement

a. The following table summarises the minimum qualifications necessary for advancement. It is intended as a guide only. Full details will be found in B.R. 1077 for W.R.N.S. and Admiral Commanding Reserves Standing Orders (distributed to R.N.R. Training Centres only), for W.R.N.R. (Amdt. No. 1).

ADVANCEMENT TO:—	SENIORITY IN PRESENT RATE	PROFESSIONAL EXAMINATION	V.G. CONDUCT
Able rate	Communication: 12 to 15 months depending on pass- ing marks in Part II Switchboard: 12 months	Part II examination	—
Leading rate	18 months	Communication: examination after course Provisional examination Switchboard: no examination	6 months
Petty Officer	12 months	As above	6 months
Chief Wren	3 years	Nil	6 months

522. Advancement to the Able rate

a. Wren Radio Operators are advanced to the Able rate after 12 to 15 months' service in the Ordinary rate, according to Part II examination results as follows:—

Normal advancement At 15 months.
5 per cent above average passing mark .. At 14 months.
10 per cent above average passing mark .. At 12 months.

b. Wren Switchboard Operators are advanced to the Able rate after 12 months in the Ordinary rate.

523. Recommendations to qualify for Leading and Petty Officer Wren Radio Operator and Radio Operator (M)

a. Recommendations to qualify professionally for Leading and Petty Officer Wren Radio Operator and Radio Operator (M) are to be forwarded to the Superintendent W.R.N.S. (Training and Drafting) H.M.S. *Dauntless* copy to the Captain, H.M.S. *Mercury*, as soon as a rating applies, is eligible, and is recommended.

b. Ratings cannot normally be recommended for the Petty Officer rate until they have attained three months' seniority in the Leading rate. Wren Radio Operators and Radio Operators (M) however, may apply to take the course for Leading Wren Radio Operator at any time after advancement to the Able rating. Providing that Commanding Officers are satisfied that ratings possess the necessary qualities which, with further experience if necessary, will fit them to make efficient Leading Wren Radio Operators, they should forward recommendations at the earliest opportunity. Recommendations should not be withheld merely because a rating is relatively inexperienced.

c. Ratings who are 'highly' recommended are given preference when drafting ratings to courses, and such recommendations should be awarded with great discrimination and limited to outstanding ratings.

d. Ratings are selected for the qualifying courses, held in H.M.S. *Mercury*, so far as the drafting situation permits, in accordance with their position on the roster for the course.

e. Courses at the Signal Training Centre, Malta, are arranged by the Commander-in-Chief, Mediterranean, who will select candidates from the rosters of those recommended, and serving on the station.

f. Ratings awaiting selection for a course, may however, apply at any time, to qualify provisionally as described in paragraph 528.

g. Ratings who fail to pass the professional examination for advancement may apply to be recommended again after three months in the case of candidates for Leading rate, and six months in the case of candidates for Petty Officer rate. The basic date of such ratings is the date of this new recommendation.

524. Application for advancement to Leading and Petty Officer Wren Switchboard Operator

There are no qualifying courses or examinations for advancement to Leading and Petty Officer Wren Switchboard Operator. Ratings who are eligible and recommended are placed direct on the advancement roster by means of form S.507(W) as described below.

525. Half-yearly recommendations for advancement

a. Ratings who are fully qualified for higher rate are recommended for advancement on form S.507(W) which is to be forwarded to the Superintendent W.R.N.S. (Training and Drafting), H.M.S. *Dauntless* on 31st May and 30th November.

b. Ratings who are not recommended for immediate advancement due to inexperience or any other cause, but who are otherwise fully qualified are to be included on the back of form S.507(W).

c. Full instructions on rendering form S.507(W) are given in B.R. 1077, Chapter 7.

526. Advancement rosters

a. Ratings who are recommended for advancement are placed on the appropriate advancement roster according to their basic dates which are, for Wren Radio Operators and Radio Operators (M), the dates on which they applied and were recommended to qualify professionally for higher rate as shown on form S.1303A, and for Wren Switchboard Operators, their seniority in the lower rate.

b. Should a rating not be recommended for advancement on form S.507(W), her name is removed from the roster until she is re-recommended when it will be replaced according to the original basic date.

c. A recommendation for accelerated advancement (red ink) has the effect of ante-dating the basic date by one month.

527. Advancement in rating

The fact that a rating is due for advancement is promulgated on form B.13(W) by the Superintendent W.R.N.S. (Training and Drafting) to the Commanding Officer of the establishment in which the rating is serving. It is the responsibility of the Commanding Officer to confirm that the rating is in all respects qualified and fit for advancement, and for this purpose he may keep the form B.13(W) for up to one month before advancing the rating. If she is not considered suitable or is ineligible (e.g. conduct) it is to be returned to H.M.S. *Dauntless* with a statement as to the reason.

528. Provisional examinations

- a. Ratings who have been recommended on Form S.1303A may apply to be provisionally examined at any time. Applications should be forwarded to Commanders-in-Chief (through appropriate Administrative Authorities) on Forms S.442. Before forwarding an application, the Commanding Officer should satisfy himself that the candidate has made adequate preparation and stands a reasonable chance of passing the examination. Form S.1124A is to be rendered to the Captain, H.M.S. *Mercury*, and the Superintendent W.R.N.S. (Training and Drafting), H.M.S. *Dauntless*, immediately on completion of a provisional examination.
- b. The basic date of a successful candidate will be the date of recommendation on Form S.1303A and this date is to be recorded on service certificates, history sheets and Forms S.1124A.
- c. Ratings who have passed the provisional examination and also hold the necessary non-professional qualifications are to be included on Forms S.507(W).
- d. They will not be entitled to scale 'A' pay under B.R. 1950, Article 580(a), *Naval Pay Regulations*—but will be given preference (so far as drafting permits) when selecting candidates for courses, and will thus be able to obtain scale 'A' pay earlier than they would otherwise do.
- e. Form B.13W will be issued in the usual way when a rating comes to the top of the advancement roster and a vacancy occurs. Advancement will be to the Acting rate only, confirmation being given on passing the normal advancement course.
- f. Ratings who fail a provisional examination may apply to be re-examined after an interval of six months. If they fail at the second attempt, they must await selection for an advancement course. In exceptional circumstances, however, the examining officer may recommend on the rating's history sheet a third attempt after a further interval of six months.
- g. The basic date of ratings who fail a provisional examination will remain unaltered.
- h. The basic date of ratings, who, having passed the provisional examination decline to take or fail the advancement course, will be cancelled and the normal rules for re-recommendation on Form S.1303A will apply. Ratings already advanced on a provisional basis who subsequently decline or fail the advancement course are to be reverted in accordance with B.R.1077 (53), Article 0714 and the fact reported on Form S.161.
- i. Officers conducting provisional examinations are to be guided by the standards of knowledge given in Chapter 5, Section 3.
- j. The oral part of the examination is to be based on Local Station Orders and the equipment in the rating's own establishment, due regard being paid to the candidate's past and present employment.

529. Courses for W.R.N.R. communication ratings

- a. Qualifying courses for advancement to Leading and Petty Officer rates are carried out in H.M.S. *Mercury*.
- b. Qualifying courses for junior ratings are carried out at the Signal Training Centre, Devonport.

530-550. *Spare.*

EXAMINATIONS AND STANDARDS OF KNOWLEDGE

551. Introduction

a. This Section contains details of passing percentages for W.R.N.S. and W.R.N.R. Radio Operator ratings and standards of knowledge tables in the following subjects:—

- General communication instructions
- Radio communication organisation
- Radio technical
- Voice operating
- A.T. procedure
- Operating ability

b. *Cryptography.* Standards of knowledge for Wren Radio Operator ratings are given in *Cryptographic Operating Instructions.*

c. Standards of knowledge for Wren Radio Operators (M) except where otherwise indicated are the same as those for Wren Radio Operators.

552. Passing percentages for Wren Radio Operator ratings

SUBJECT	WREN RADIO OPERA- TOR (M)	WREN RADIO OPERATOR		LEADING WREN RADIO OPERATOR			PETTY OFFICER WREN RADIO SUPERVISOR		
	W.R.N.S.	W.R.N.S.	W.R.N.R.	W.R.N.S.	PROV.	W.R.N.R.	W.R.N.S.	PROV.	W.R.N.R.
General communication instructions ..	75 }	75	75	80 }	80	80	80 }	80	80
Radio communication organisation ..	75 }			80 }		80	80 }		80
A.T. procedure practical	75	75	75	80	80	80	80	80	80
A.T. procedure paper	75	75	75	80	—	80	80	—	80
Voice operating practical	75	75	75	80	80	80	80	80	80
Cryptography	80	80	80	80	80	80	80	80	80
Technical	75	—	—	—	—	—	—	—	—
Theory	60	—	—	—	—	—	—	—	—
Practical W/T procedure	75	—	—	—	—	—	—	—	—
Keyboard operating	35/94	40/94	30/94	—	—	30/94	—	—	30/94
Teletyping	35/94	40/94	30/94	40/96	—	30/94	40/96	40/96	30/94
Typing layout	—	94	94	—	—	—	—	—	—
M.T.X.	15/80	—	—	—	—	—	—	—	—
M.M.X.	18/94	—	—	—	—	—	—	—	—
M.K.X.	22/94	—	—	—	—	—	—	—	—

Notes.—(i) Where subjects are bracketed together the examination is a combined one.

(ii) W.R.N.R. Ordinary rates who achieve 20/94 or over, but under 30/94 in B.K.X. and T.T.X. in examination for Able rate may be considered passed for Acting Able rate.

(iii) W.R.N.R. Leading and Petty Officer rates are only required to carry out B.K.X. when T.T.X. facilities are not available.

553. General communication instructions

Standards

- A Thorough knowledge and ability to look up references quickly.
- B Good knowledge and general idea of where references are to be found.
- C Knowledge of principles only. General idea of where information is contained.

SUBJECT	WREN RADIO OPERA- TOR		LEADING WREN RADIO OPERATOR			PETTY OFFICER WREN RADIO SUPERVISOR		
	W.R.N.S.	W.R.N.R.	W.R.N.S.	PROV.	W.R.N.R.	W.R.N.S.	PROV.	W.R.N.R.
PRINCIPLES OF NAVAL COMMUNICATIONS								
Instructions on reticence and responsibility of Naval Communication personnel	A	A	A	A	A	A	A	A
Standard phraseology and phonetic alphabet	A	A	A	A	A	A	A	A
Means of communication	B	C	A	A	B	A	A	A
Use of precedences	B	C	A	A	B	A	A	A
Plaindress and Codress	B	C	A	A	B	A	A	A
COMMUNICATION SECURITY								
Physical transmission and cryptographic security—their interrelation-ship	C	C	B	C	C	B	B	B
Security of landlines	B	C	A	B	C	A	A	B
Transmission security	C	C	B	C	C	B	B	B
Physical security } included in Crypto instructions (See <i>Cryptographic</i> Crypto security } <i>Operating instructions</i>)								
MESSAGE ORIGINATION								
Originators' responsibilities	B	—	A	B	B	A	B	A
Security classifications	B	—	A	B	B	A	A	B
Drafting the text	B	—	A	B	B	A	A	B
Special prefixes and message instructions	B	—	A	B	B	A	A	B
MINIMISE	B	—	A	—	C	A	C	B
Use of codeword CLEAR	B	—	A	—	C	A	C	B
ROUTING AND PREPARING MESSAGES FOR DESPATCH								
Naval Messages	C	C	B	C	C	A	B	B
Commercial messages	—	—	C	—	—	C	C	B
Routing directory	B	C	B	B	C	A	B	B
Hand messages	C	C	B	C	C	A	B	B
Airgrams and postagrams	C	—	B	C	C	A	B	B
MESSAGE HANDLING ASHORE								
Layout of offices	C	C	B	C	C	B	B	B
OUT messages	C	C	B	C	C	A	B	B
IN messages	C	C	B	C	C	A	B	B
THROUGH messages	C	C	B	C	C	A	B	B
Distribution systems	C	C	B	C	C	B	B	B
Files checks and records	C	C	B	C	C	B	B	B
Special arrangements in large headquarters or shore wireless stations	C	C	B	C	C	C	B	B
Hand message organisation	C	C	B	C	C	B	B	B
Basegrams	B	C	B	B	B	A	B	B
GENERAL MESSAGES								
Definitions	B	C	A	C	B	A	B	A
Admiralty general messages	B	C	A	C	B	A	B	A
Station, local general messages	C	C	B	C	C	B	B	C
Navigation general messages (war)	C	C	B	C	C	C	C	C
Navigation general messages (peace)	C	C	B	C	C	C	C	C
Address indicating groups	B	—	—	—	B	B	C	B
Allied general messages	—	—	C	—	—	B	C	C

553. General communication instructions—continued

SUBJECT	WREN RADIO OPERA- TOR		LEADING WREN RADIO OPERATOR			PETTY OFFICER WREN RADIO SUPERVISOR		
	W.R.N.S.	W.R.N.R.	W.R.N.S.	PROV.	W.R.N.R.	W.R.N.S.	PROV.	W.R.N.R.
RADIO TELEGRAMS								
Types of radiotelegrams	—	—	B	—	—	B	C	C
Private messages	—	—	B	—	—	B	—	—
Routing and delivery	—	—	C	—	—	C	—	—
Accounting	—	—	C	—	—	C	—	—
SPECIAL MESSAGES								
LOGREQ messages	C	C	B	C	C	B	B	B
Rainbow messages	C	C	B	C	C	B	B	B
Movement reports	—	—	C	—	—	C	C	C
N.C.S. reports	—	—	C	—	—	C	C	C
PUBLICATIONS								
Relationship	C	C	B	C	C	B	C	C
Station communication orders	C	—	B	C	C	B	B	B
A.F.O.(S)	C	C	B	C	C	A	B	B
Corrections—changes	C	—	B	—	C	A	B	B
COMMAND STRUCTURE								
Admiralty, Commanders-in-Chief, Flag Officers	C	C	B	C	C	B	C	C
Organisation of the Admiralty, Whitehall M.S.O.	B	C	B	C	C	B	B	C
Allied Command. CAN/UK/US, NATO, SEATO	C	C	B	C	C	B	C	C
MESSAGE HANDLING IN SHIPS								
Layout of offices	—	—	C	—	—	C	—	—
Out and In messages	—	—	C	—	—	C	—	—
Through messages	—	—	C	—	—	C	—	—
Distribution	—	—	C	—	—	C	—	—
Files, checks and records	—	—	C	—	—	C	—	—

554. Radio communication organisation

Standards

- A Thorough knowledge and ability to look up references quickly.
 B Good knowledge and general idea of where references are to be found.
 C Knowledge of principles only. A general idea of which books contain the necessary information.

SUBJECT	WREN RADIO OPERA- TOR		LEADING WREN RADIO OPERATOR			PETTY OFFICER WREN RADIO SUPERVISOR		
	W.R.N.S.	W.R.N.R.	W.R.N.S.	PROV.	W.R.N.R.	W.R.N.S.	PROV.	W.R.N.R.
GENERAL								
Radio tree	B	C	B	—	B	B	C	B
Systems of transmission	B	C	B	C	B	B	C	B
Propagation of radio waves	C	—	C	—	C	C	C	C
STRATEGIC COMMUNICATIONS								
World-wide organisation fixed services	B	C	B	C	B	B	B	B
Broadcasts. Use of Rugby	B	C	B	C	B	B	B	B
SHIP-SHORE								
Procedure and organisation	—	—	C	—	—	C	C	C
LOCAL COMMUNICATIONS								
Harbour and base organisation	B	—	B	—	C	B	—	C
SAFETY COMMUNICATIONS								
Distress messages	C	C	B	B	C	A	B	B
Submiss/Subsunk, S.A.R.	C	—	B	C	C	B	B	B
NAVAL AIR COMMUNICATIONS								
Command organisation, principles	C	—	B	C	C	B	B	C
Introduction to S4	B	—	B	B	C	B	B	B
Carriage and use of radio in aircraft. Radio failure in flight	C	—	C	C	C	C	C	C
Principal ground/air nets	C	—	C	C	C	B	C	C
Exercise and operational nets	C	—	B	C	C	B	B	B
Naval air communications in the U.K. A.T.C. organisation. Air-move signals	C	—	B	C	C	B	B	B
Types of airfield	B	—	A	B	B	A	A	B
Communications at N.A.S.	C	—	B	C	C	B	B	C
Emergency communications at N.A.S.	C	—	B	C	C	B	B	C
Air safety organisation. QGH logging	B	—	A	B	C	B	A	B
S.A.R. organisation	C	C	B	B	C	A	B	B
Safety, urgency, distress	C	—	B	C	C	A	B	B
Maritime aircraft nets	C	—	B	C	C	B	C	C
I.C.A.O. procedure	—	—	C	—	—	B	C	C
Enemy contact reporting	—	—	C	—	C	B	C	C

555. Radio communication technical

Standards

- A Full knowledge of operation and tuning without the aid of tuning guides. The ability to recognise a major fault or reduction in performance. A good knowledge of the principles involved.
- B The ability to tune and operate efficiently with the aid of tuning guides. A basic knowledge of the principles involved.
- C The ability to operate efficiently once the equipment has been set up. Full knowledge of the functions and capabilities.
- D The ability to recognise with a knowledge of the function and capabilities.

EQUIPMENT	WREN RADIO OPERATOR (M)	WREN RADIO OPERATOR		LEADING WREN RADIO OPERATOR		PETTY OFFICER WREN RADIO SUPER- VISOR	
		W.R.N.S.	W.R.N.S.	W.R.N.S.	W.R.N.S.	W.R.N.S.	W.R.N.S.
A. TRANSMITTERS							
691	—	C	D	C	C	C	C
B. RECEIVERS							
B40	B	C	D	B	C	B	C
B41	B	C	D	B	C	B	C
CUH	—	C	D	C	C	C	C
C. MISCELLANEOUS							
RATT (broadcast and intership)	B	C	D	B	C	B	C

556. Voice operating

Standards

- A Thorough knowledge and good practical ability.
- B Good knowledge and fair practical ability.
- C Knowledge of principles and where to look up details.

SUBJECT	WREN RADIO OPERA- TOR		LEADING WREN RADIO OPERATOR			PETTY OFFICER WREN RADIO SUPERVISOR		
	W.R.N.S.	W.R.N.R.	W.R.N.S.	PROV.	W.R.N.R.	W.R.N.S.	PROV.	W.R.N.R.
Voice technique	A	A	A	A	A	A	A	A
General instructions to operators	A	A	A	A	A	A	A	A
Basic message format	A	A	A	A	A	A	A	A
Types of messages	A	A	A	A	A	A	A	A
Operating rules	A	A	A	A	A	A	A	A
Abbreviated procedure	A	A	A	A	A	A	A	A
Enemy reporting	—	—	—	—	—	C	—	—
AIR PROCEDURES								
Standard drills	A	—	A	A	—	A	A	—
Anoxia and speechless drills	A	—	A	A	—	A	A	—
Safety, urgency and distress	A	—	A	A	—	A	A	—
Homings, bearings and fixes }	A	—	A	A	—	A	A	—
Civil air including distress	A	—	A	A	—	A	A	—

557. A.T. procedure

Standards

- A Good knowledge and good practical ability.
- B Good knowledge and fair practical ability.
- C Knowledge of principles and fair practical ability under supervision.

SUBJECT	WREN RADIO OPERA- TOR		LEADING WREN RADIO OPERATOR			PETTY OFFICER WREN RADIO SUPERVISOR		
	W.R.N.S.	W.R.N.R.	W.R.N.S.	PROV.	W.R.N.R.	W.R.N.S.	PROV.	W.R.N.R.
GENERAL								
Teleprinter 7B and 12	A	A	A	A	A	A	A	A
Associated A.T. equipment	A	B	A	A	A	A	A	A
Murray Code, recognition of ZCZC, space and letter shifts	A	A	A	A	A	A	A	A
Preparation of messages for transmission, including multi-page long messages	A	A	A	A	A	A	A	A
Definitions used in Tape Relay	A	A	A	A	A	A	A	A
Basic message format	A	A	A	A	A	A	A	A
Confirmations, corrections and cancellations	A	B	A	A	A	A	A	A
Rules for counting groups	A	B	A	A	A	A	A	A
SWITCHED NETWORK WORKING								
Equipment	A	C	A	A	B	A	A	A
Procedure	A	B	A	A	A	A	A	A
TAPE RELAY								
Construction and use of routeing indicators	A	A	A	A	A	A	A	A
World-wide tape relay network and Commonwealth section	A	B	A	A	A	A	A	A
Routeing line segregation	A	A	A	A	A	A	A	A
Missent, misrouted messages	B	C	A	A	B	A	A	A
Circuit continuity, out of touch, call and standard test tapes, discrepancies in channel numbers—responsibilities of receiving stations	A	B	A	A	A	A	A	A
Alternative routeing and transfer between sections	B	C	A	A	B	A	A	A
Suspected duplicates, messages sent subject to correction	C	C	B	B	B	A	A	A
Receipts of fixed services	A	B	A	A	A	A	A	A
MISCELLANEOUS								
U.K. broadcast network	B	C	B	B	B	A	A	B
Met. network and A.T.T.C. network	C	C	B	B	B	B	B	B
RATT broadcast procedure	C	C	B	B	B	B	B	B

558-589. Spare.

590. Standards of operating ability

SYSTEM	See NOTE BELOW	RELEVANT PRACTICAL EXERCISE See CHAPTER 9	WREN RADIO OPERATOR (M)	WREN RADIO OPERATOR		LEADING WREN RADIO OPERATOR		PETTY OFFICER WREN RADIO SUPERVISOR	
			W.R.N.S.	W.R.N.S.	W.R.N.R.	W.R.N.S.	W.R.N.R.	W.R.N.S.	W.R.N.R.
Basic keyboard operating ..	(i)	BKX	35/94	40/94	30/94	—	30/94	—	30/94
Teletyping		TTX	35/94	40/94	30/94	40/96	30/94	40/96	30/94
Typing layout		TLX	—	94	94	—	—	—	—
Radio morse—manuscript reception		MMX	18/94	—	—	—	—	—	—
Radio morse—keyboard reception		MKX	22/94	—	—	—	—	—	—
Radio morse—transmission ..		MTX	15/80	—	—	—	—	—	—

Notes:—(i) Ordinary rates, W.R.N.R., who achieve 20/94 or over, but under 30/94 in BKX or TTX may be considered passed for acting Able rate.

(ii) W.R.N.R. Leading and Petty Officer rates are only required to carry out BKX when TTX facilities are not available.

Chapter 6

ROYAL MARINES

Section 1

INITIAL TRAINING AND STANDARDS OF KNOWLEDGE

Standards of knowledge

- A Thorough knowledge.
- B Good.
- C Fair.
- D General outline.

601. Marine (S.3)

TOTAL TRAINING TIME—15 WEEKS.

	STANDARD OF KNOWLEDGE
Map reading and camouflage	A
Signal centre—working and organisation	B
Radio instruments (Cdo)—principles and operating	B
Field lines	C
Theory—radio and line	D
Electronic warfare (Cdo)	D
<i>Procedure</i>	
Voice (Cdo)	A
Telegraph (Cdo)	A

602. Corporal (S.2)

TOTAL TRAINING TIME—15 WEEKS

	STANDARD OF KNOWLEDGE
COMMANDO PHASE (10 WEEKS)	
Field lines	A
Radio instruments (Cdo)—principles and operating	A
Battery charging	A
Signal centre—working and organisation	B
Theory—radio and line	B
Electronic warfare (Cdo)	B
<i>Procedure</i>	
Voice (Cdo)	A
Telegraph (Cdo)	A
AMPHIBIOUS PHASE (5 WEEKS)	
Waterproofing	B
Minor landing craft manoeuvring signals	B
Naval radio communications organisation	C
Amphibious warfare organisation	C
<i>Combined procedure</i>	
Voice	A
Telegraph	B

603. Sergeant (S.1)

TOTAL TRAINING TIME—24 WEEKS

INFANTRY PHASE (13 WEEKS)

Regimental Signal Instructor course at the Signal Wing, School of Infantry, Hythe, preceded by 1 week's refresher.

COMMANDO PHASE (9 WEEKS)

					STANDARD OF KNOWLEDGE
Staff duties and administration	..	..	..	..	A
Field lines	..	..	..	..	A
Radio instruments (Cdo)—principles and operating	..	..	..	..	A
Theory—radio and line	..	..	..	..	A
Electronic warfare and cipher (Cdo)	..	..	..	..	A
Signal tactics	..	..	..	..	B
Teaching practice	..	..	..	..	B

NAVAL PHASE (1 WEEK)

Minor landing craft manoeuvring signals	..	..	..	..	A
Naval radio organisation	..	..	..	..	B
<i>Combined procedure</i>					
Voice	..	..	..	..	A
W/T	..	..	..	..	A
V.S.	..	..	..	..	B

AMPHIBIOUS PHASE (1 WEEK)

Royal Signals Lieutenants course at JSAWC.

604. Sergeant/Colour Sergeant (Signal Instructor)

TOTAL TRAINING TIME—3 WEEKS

Before being selected for RMSI course a SNCO will be required to have considerable instructing experience.

PHASE 1 (1 WEEK)

Visit to Joint Services Amphibious Warfare Centre, Poole.

PHASE 2 (1 WEEK)

Methods of instruction course at the School of Infantry, Warminster.

PHASE 3 (1 WEEK)

Instruction and exercises in the duties of a signal SNCO, held at Signal Training Wing, R.M.B. Eastney.

605. Passing and Distinguished percentages for R.M. Signallers

	PASSING PERCENTAGE	DISTINGUISHED PERCENTAGE
Sergeant (S.1)	60	80
Corporal (S.2)	60	80
Marine (S.3)	60	80

606. Royal Marines Signal Officer

Royal Marines Officers qualifying in signals carry out a series of courses lasting 32 weeks as shown below, designed to train officers for employment as Unit Signal Officers. On completion of a tour in these units, certain officers will be selected for further training for higher grade signal appointments such as Brigade Signal Officer.

PHASE 1 (4 WEEKS)

Held at Signal Training Wing, Royal Marines Barracks, Eastney. Aim is to give sufficient knowledge of Infantry Signalling to enable students to pass in to Hythe.

PHASE 2 (12 WEEKS)

Held at Signal Wing, School of Infantry, Hythe. Aim is to qualify officers as Battalion Signal Officers and Signal Instructors. Designed to give Royal Marines Officers sufficient basic knowledge, to fit them for phase 3.

PHASE 3 (9 WEEKS)

Held at Signal Training Wing, Royal Marines Barracks, Eastney. Aim is to teach the additional signal knowledge required to carry out the duties of a Commando Signal Officer.

PHASE 4 (2 WEEKS)

Held at Signal Training Wing, Royal Marines Barracks, Eastney. Aim is to give officers a general knowledge of Naval Communications Organisation and a detailed knowledge of Naval Radio Voice, W/T and VS procedures with a view to understanding the problems of communications in amphibious and helicopter supported operations.

PHASE 5 (1 WEEK)

Held at Joint Services Amphibious Warfare Centre, Poole. Aim is to study communication problems in amphibious operations.

PHASE 6 (4 WEEKS)

Held at H.M.S. *Mercury*. Aim is to give good general knowledge of Naval Communications organisation and cryptography, with a view to working in conjunction with naval communications in amphibious operations. Practical exercises are included, to maintain standards achieved in phase 4.

607. *Spare.*

608. Standards of operating ability (Expressed as Speed/Accuracy)

SYSTEM	RELEVANT PRACTICAL EXERCISE	S.3	S.2	S.1	SIGNAL OFFICER (See Note)
Flashing reception	FRX	—	10 95	10 95	10 95
Flashing transmission	FTX	—	10 95	10 95	10 85
Semaphore reception	SRX	6 95 72	18 8 95 96	18 8 95 96	18 8 96
Semaphore transmission	STX	6 95 80	18 8 95 90	18 8 95 90	18 8 85 90
Morse manuscript reception	MMX	13 95	18 95	22 95	18 96
Morse transmission	MTX	13 95	18 95	22 95	18 90

Note :—Standards for Signal Officers are those aimed at during Phases 1–4.

609–620. *Spare.*

Section 2

ROYAL MARINES SIGNAL OFFICERS
SYLLABUS OF NAVAL COMMUNICATION COURSES AND STANDARDS OF
KNOWLEDGE

621. Radio communication organisation and general communication instructions

SUBJECT	ROYAL MARINE SIGNAL OFFICER
Relationship of communication publications	B
Message origination	A
Special messages and general messages	B
Radio tree	C
Strategic communications	C
Ship broadcasts and ship-shore	C
Local, passage and harbour communications	C
Tactical communications	C
Merchant ship communications	C
Submarine and safety communications	C
Naval air communications	C
N.A.T.O. command structure	C

622. W/T procedure (Phases 1-4)

SUBJECT	ROYAL MARINE SIGNAL OFFICER
Communication discipline	A
Instructions to operators	A
Calling and answering	A
Signal strength and readability	A
Tuning and net control	A
Relaying	A
Identities, repetitions	A
Checks, verifications, acknowledgments	A
Bombardment and spotting drill	A
Executive method	A
Intercept and broadcast method	B

623. Voice operating (Phases 1-4)

SUBJECT	ROYAL MARINE SIGNAL OFFICER
Circuit discipline	A
Instructions to operators	A
Format	A
Prowords	A
Calling and answering	A
Signal strength	A
Net control	A
Relaying	A
Checks and verifications	A
Identities, repetitions	A
Executive method	A
Bombardment spotting drill	A

624. Automatic telegraphy

SUBJECT	ROYAL MARINE SIGNAL OFFICER
Outline of L.T. and A.T. systems	B
T/P procedure (on line circuits)	B
RATT procedure	C

625. Electronic Warfare Organisation

SUBJECT	ROYAL MARINE SIGNAL OFFICER
Propagation in E.W.	B
Equipment, brief capabilities	B
Principles of radar DF	B
Identification of radar transmissions	B
ECM organisation at sea	B
Communication security	B

626. Radio technical (B.R. 222 and B.R. 229)

SUBJECT	ROYAL MARINE SIGNAL OFFICER
Layouts and brief outlines of equipment fitted in H.M. ships, cruisers, destroyers and frigates.	C
Ship MF and HF transmitters	C
Ship MF and HF receivers	B
VHF and UHF equipment	C
Ship's aerials and radio hazards	D
AT and shipborne RATT equipment	C
Type 612 E.T. B.46 and B.47	C

627. Cryptography

Standards of knowledge tables are contained in the Cryptographic Operating Instructions.

628. Passing percentages

SUBJECT											ROYAL MARINE SIGNAL OFFICER
Radio Communication Organisation	}	combined paper	..	..	..	..	..	..	..	80	
General Communication Instructions											
Electronic Warfare Organisation											
Cryptography	..	..	..	..	..	..	..	..	..	80	

Chapter 9

PRACTICAL EXERCISES

Section 1

INTRODUCTION

901. General

a. Object of practical exercises.—The various exercises laid down in this chapter are designed to provide realistic means of practising at each communication system, with a concurrent assessment of the operator's ability. They are therefore to be used for both examinations, and weekly practice as described below.

b. Weekly practice.—Communication operators soon lose their ability if this is not exercised regularly. In order that the standards of practical ability laid down are maintained, a general scale of exercises to be carried out by all ratings is given in the table in paragraph 951. The basis of this scale is that, provided the required standard is maintained, only one exercise of each type appropriate to the rate is to be carried out per week. This may be reduced to one exercise per month if the operator is currently employed on operating live systems (*see* Note 1 to table). If, however, an operator's results fall below the required standard the number of exercises to be carried out is increased in the following week, in order that he may gain more practice and so improve.

c. Identification of exercises.—If for any reason a practical exercise is transmitted over a live communication system (radio, visual, or line) it must be identified as being for operator training only in accordance with A.C.P. 122, Article 425*b*, 2(*a*). This is to be read as requiring the word 'DRILL' to be included at the beginning and end of *each* text appearing in an exercise, *i.e.*, in each part and in each short message as appropriate.

d. Accented letters.—Attention is drawn to paragraph 253 Note (iii). The letters which should be learnt are :—

Ä	· · · · ·
Å	· · · · ·
È	· · · · ·
Ö	· · · · ·
Ü	· · · · ·
CH	· · · · ·
N	· · · · ·

902. Standard method of marking keyboard exercises

a. Definitions

- (1) The UNIT WORD in keyboard exercises is six key depressions—five for the word itself, and one for the space.
- (2) A KEY DEPRESSION is any operation of any key, including letters, figures, space, shift and function keys. (In the case of a typewriter, the operation of the Line feed/Carriage return bar counts as one key depression only for marking purposes.)

b. Speed marking

- (1) Divide the total number of key depressions by six to obtain the number of unit words. All key depressions are to be counted, including those that are part of incorrectly typed words, etc.
- (2) Divide the total number of unit words by the number of minutes the test has lasted, to obtain the Speed Marking.

Example : IN A FIVE-MINUTE EXERCISE

$$\text{Total number of key depressions} = 1200$$

$$\text{,, ,, ,, unit words} = \frac{1200}{6} = 200$$

$$\text{Speed marking} = \frac{200}{5} = 40 \text{ w.p.m.}$$

c. Accuracy marking

- (1) The following mistakes count as one error :—

- (a) An incorrectly typed character.
- (b) The omission of a character.
- (c) The insertion of an unwanted character.
- (d) Two incorrectly transposed characters.
- (e) An incorrectly operated space, shift, or function key.
- (f) Failure to operate a space, shift or function key.

- (2) If an error is corrected in accordance with the established procedure for the system, the total penalty is a half-error for each word or group so corrected.

- (3) To obtain the accuracy marking multiply the total number of errors assessed in accordance with sub-paragraphs (1) and (2) by 100, divide this by the total number of unit words typed (see sub-paragraph b(1)), and subtract the result from 100 :—

*Example :—*An exercise contains 1200 key depressions, seven single errors, and two corrected words.

$$\text{Total number of errors} = 7 + 1 = 8$$

$$\text{Total number of unit words} = \frac{1200}{6} = 200$$

$$\text{Accuracy marking} = 100 - \frac{8 \times 100}{200} = 96$$

d. Expression of results.—The results of keyboard exercises are to be expressed in the form speed/accuracy :

Example : The results of the exercise marked in the example above would be expressed as '40/96'.

e. Error rate.—It will be seen that the accuracy marking is an arbitrary assessment, and does not give an absolute percentage of the operator's accuracy. If such an assessment is required, this is best expressed as a percentage 'error rate', which is obtained by dividing the total number of errors by the total number of key depressions, and multiplying by 100. Even this figure is arbitrary, however, to the extent that sub-paragraph c(2) above is arbitrary :

Example : In the exercise described in the example above :

$$\text{Error rate} = \frac{8}{1200} \times 100 = 0.67 \text{ per cent.}$$

903-920. Spare.

Section 2

DESCRIPTION OF THE VARIOUS EXERCISES

921. Standard basic keyboard exercise (Short title 'BKX')

a. Object.—The standard basic keyboard exercise is designed to assess speed and accuracy at touch typing. It is carried out on a typewriter and is primarily for training and examinations up to ~~ROO/P.O. and equivalent~~ ¹⁹⁴⁵. It is not designed to assess ability at layout or procedure, other than that required to set out the typescript on the page, marginally indented, and with words, groups and lines properly spaced.

b. Conduct

- (1) The operator copies for three minutes from a piece of English plain language. Included in every 400 key depressions there are to be at least 20 upper case characters (*i.e.*, figures, symbols or function keys).
- (2) The operator then copies for two minutes from a piece of random five letter groups.
- (3) The pieces given for copying are to be laid out in block form with straight margins, and words and lines separated by a single space.
- (4) Mistakes may be corrected by making two space bar depressions and then retyping the whole word correctly. Such corrected mistakes count as half errors in accordance with paragraph 902c(2).

c. Marking.—The exercise is to be marked and the results expressed as described in paragraph 902.

922. Standard teletypewriter exercise (short title 'TTX')

a. *Object.*—The standard teletypewriter exercise is designed to assess speed and accuracy at transmission from a teletypewriter. It may be carried out on any teletypewriter machine. (Note: "teletypewriter" is synonymous with "teleprinter").

b. *Conduct*

- (1) The operator teletypes the heading and text of a set plaindress message as if transmitting a signal, for ~~3~~⁶ minutes, after which teletyping is to cease. The operator is then allowed one minute to correct any errors not corrected during transmission and to teletype the message ending. This is to be followed immediately by the operator teletyping the heading and text of a set codress message for ~~3~~⁴ minutes, after which teletyping is to cease and the operator is then allowed 1 minute to correct any errors not corrected during transmission and to teletype the message ending. Mistakes may be corrected during transmission or in the message ending. See sub-paragraph c.

- (2) The messages are composed as follows:—

PLAINDRESS PORTION

- (a) HEADING ... Call, precedence, D.T.G. address (originator, 1 action and 2 information addressees) BT.
- (b) TEXT ... English plain language of sufficient length to ensure operator has enough to occupy him for ~~3~~⁵ minutes, and is to include at least 20 upper case characters in every 400 key depressions.
- (c) ENDING ... After ~~3~~⁶ minutes have elapsed teletyping is to cease and the operator is allowed 1 minute to teletype the message ending and correct any mistakes not corrected during transmission.

CODESS PORTION

- (a) HEADING ... 2 encrypted callsigns, 1 plain address group, precedence, D.T.G. group count, B.T.
- (b) TEXT ... An encrypted signal in any current ~~3~~⁵ letter system of sufficient length to ensure operator has enough to occupy him for ~~4~~⁵ minutes.
- (c) ENDING ... As for Plaindress Portion.

- (4) The message format, layout and general procedure are to follow the established rules appropriate to the type of machine being used.

c. *Marking.*

- (1) The exercise is to be marked and the result expressed as described in paragraph 902.
- (2) The entire exercise, omitting message endings, is to be treated as one for assessing the speed.
- (3) Mistakes corrected during transmission or in message endings are to count as half errors. It will be noted that mistakes in message endings are included in the accuracy assessment although message endings are not included in speed assessment.
- (4) The unit word count is NOT to include key depressions spent in typing and then erasing mistakes. It will be seen that making an erasure thus incurs a penalty in the speed marking and the accuracy marking.

923. Standard tape perforating exercise (Short title 'TPX')

a. Object.—The standard tape perforating exercise is designed to assess speed and accuracy at operating a perforator to produce a message tape suitable for transmission over tape relay circuits.

b. Conduct

- (1) The operator operates the tape perforator for 10 minutes, 'taping up' the heading and text of a set plaintext message, the form of which is similar to that for the TTX.
 - (a) **HEADING.** Call (three routing indicators as for predetermined routing), precedence, D.T.G., address (originator, one action, and two information addressees, in call signs or address groups). BT.
 - (b) **TEXT.** As for the TTX.
 - (c) **MESSAGE ENDING.** As for the TTX. A further minute is allowed to correct mistakes. The same marking rules apply.
- (2) The message format, message layout, and general procedure are to follow tape relay procedure laid down in A.C.P. 127 and appropriate supplement.
- (3) Mistakes may be corrected during transmission or in the message ending. Such corrected mistakes count as half errors in accordance with sub-paragraph 902 *c* (2).
- (4) Mistakes may also be erased if such a facility exists on the machine being used. Such corrected mistakes do not count as errors.

c. Marking

- (1) The exercise is to be marked and the results expressed as described in paragraph 902. The accuracy assessment is to include the correct operation of all function keys, and the message layout.
- (2) With reference to sub-paragraph *b* (4) the unit word count is *not* to include key depressions spent in typing, and then erasing, mistakes. It will be seen that making an erasure thus incurs a penalty in the speed marking, but not the accuracy marking.
- (3) See sub-paragraph *b* (1) (c) regarding the marking of the message ending.

924. Standard typing layout exercise (Short title 'TLX')

a. Object.—The standard typing layout exercise is designed to assess accuracy at typing a message for distribution with the correct layout. Speed is not assessed, other than by imposing a nominal time limit for the exercise.

b. Conduct

- (1) The operator types a message for distribution exactly in accordance with the standard message layout described in A.F.O. ~~XXXXXXXXXXXX~~ **S2/61 paragraph 1501.**
- (2) The 'original' from which the operator copies is to be a typical message as might be received from the Wireless Office or Flag Deck, to which has been added a rough indication of the distribution required.
- (3) The message should normally contain one action and two information addressees, and carry a security classification. The text is to be separated into paragraphs, and be of the order of 50 words long. It should contain at least one proper noun, and one correspondence reference or position.
- (4) When completed the message is to be stamped with security warnings, etc., so as to be in all respects ready for distribution.
- (5) Typing errors are *not* to be corrected by overtyping. To correct an error the whole word must be recommenced after a space, and the word to be erased indicated by ringing it in pencil, at the end.
- (6) There is no speed assessment as such, but a nominal time limit of 10 minutes is to be imposed.

c. Marking.—Assess the exercise for accuracy out of 100 as follows:—

- (1) 25 for general appearance, correct layout, and use of stamps.
- (2) 75 for typing accuracy. Mistakes count as follows.
 - (a) Uncorrected mistakes, one error per word.
 - (b) Corrected mistakes *b* (5) $\frac{1}{2}$ error per word.

925. *Spare.*

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Change No. 9

(88855)—73

926. Standard morse manuscript reception exercise (Short title 'MMX')

a. Object. The standard morse manuscript reception exercise is designed to assess accuracy at receiving radio morse in manuscript.

b. Conduct

- (1) The exercise is in four parts, and is similar in layout to the MKX. The unit word used is the same.
- (2) The exercise as received should be laid out in a realistic manner. Form S.1321A should be used if available.
- (3) The exercise is to be transmitted at the speed required for the personnel receiving it.
- (4) A minute is to be allowed at the end to allow corrections to be made. These do not count as errors.
- (5) Barred and accented letters and punctuation marks received over a morse circuit are always to be typed in accordance with the automatic morse supplement to A.C.P. 124B.

c. Markings

- (1) The accuracy marking is to be assessed in a similar way as the MKX except that the instructions must be read as applying to writing and not typing, and those having no application to manuscript reception disregarded. The results are to be expressed in the same manner.
- (2) It will be seen that it is of no consequence which type of unit word is used to measure the length of the exercise, since the number of letters in each is the same. Thus word counts expressed in keyboard unit words in a book of exercises prepared for MKX can be used for MMX marking without translation since the result would be the same.

927. Standard morse special reception exercise (Short title 'MSX')

a. Object. The standard morse special reception exercise is designed to assess the accuracy of Radio Operators (G) and (W) at receiving foreign high speed radio morse in manuscript.

b. Conduct

(1) The exercise consists of three parts:—

- (a) Foreign plain language.
- (b) Foreign encrypted five letter groups.
- (c) Foreign short messages.

The whole exercise is to consist of 1,000 symbols divided as follows:—

Part 1 is to consist of 500 symbols of foreign plain language, including a heading as used by any station other than an Allied or Commonwealth station. This will include accented letters which are to be shown with a dash above them.

Part 2 is to consist of 300 symbols including a heading as in sub-paragraph above and a text of five letter groups including accented letters.

Part 3 is to consist of 200 symbols made up of foreign short messages as transmitted by any station other than an Allied or Commonwealth station.

- (2) The exercise is to be transmitted at the speed required for the personnel receiving it.
- (3) A minute is to be allowed at the end of the exercise to allow corrections to be made.
- (4) These exercises are only to be transmitted on an internal closed circuit.

c. Marking. Each individual symbol received incorrectly counts as one error. Symbols corrected at the end of the exercise (sub-paragraph *b* (3)) do not count as errors. The total number of errors is subtracted from 1,000 and the difference divided by 10 to give the accuracy marking. The result is to be expressed as speed/accuracy.

928. Standard morse manual transmitting exercise (Short title ' MTX ')

a. *Object.*—The standard morse manual transmitting exercise is designed to assess speed and accuracy at transmitting morse manually.

b. *Conduct*

- (1) The exercise is to consist of four parts, the total of which is to be as near 1500 units (ACP 124(B), paragraph 105f) as possible :—

PART 1. 375 units of English plain language (approximately 8 words).

PART 2. 375 units of mixed letters in 5 letter groups, consisting of the alphabet mixed, plus any four letters (i.e. 30 letters in 6 groups).

PART 3. Five groups of mixed figures (four to a group) consisting of each figure (0 to 9) included twice.

PART 4. 385 units of four character call signs consisting of mixed letters and figures each followed by either the slant or hyphen sign (approximately 5 call signs).

- (2) Each part is to commence with the long break sign and the exercise is to finish with the ending sign. No other interval is required between parts.
- (3) Mistakes may be corrected during transmission, but not at the end.

c. *Marking*

- (1) The speed is to be assessed by timing the exercise between the first and last long break. For each corrected mistake up to a total of 6, 3 is to be added to the total number of words transmitted, and 2 for more than 6 errors. The result is to be divided by the time taken, and is to be expressed as words per minute. The exercise is to be reckoned as 30 words long (this figure allows for the time taken to transmit the long breaks).

Example : MTX of 30 words transmitted in 2 minutes 20 seconds. 2 corrected mistakes.

2 corrected mistakes	=	6 words
MTX	=	30 words
Total		36 words

Speed = $\frac{36}{2\frac{1}{3}}$ = 15½ w.p.m. approx.

A table to assist working out speed is given in sub-paragraph d.

- (2) The accuracy is to be marked as follows. First assess the operator's general style which is defined as the spacing of symbols and the rhythm of his morse out of 25 :—

20-25 marks	..	Good style
15-20 marks	..	Average style
Below 15 marks	..	Below average style

- (3) Then mark for errors out of 75. Each uncorrected mistake counts as two errors, each mistake corrected during transmission counts as one error. Add the two marks obtained together to obtain the accuracy marking.
- (4) The result is to be expressed as speed/accuracy.

d. Table to assess speed making allowance for corrected mistakes.

CORRECTED MISTAKES

TIME	0	1	2	3	4	5	6
1 25	21	23	25	27	29	32	34
30	20	22	24	26	28	30	32
35	19	21	23	25	27	29	30
40	18	20	22	23	25	27	29
45	17	19	21	22	24	26	27
50	16	18	19	21	23	24	26
55	—	17	19	20	21	23	25
2 00	15	16½	18	19½	21	22½	24
05	—	16	17	18	20	22	23
10	14	15	17	18	19	21	22
15	—	14½	16	18	19	20	21
20	13	14	15	17	18	19	21
25	—	13	15	17	18	19	20
30	12	13	14½	16	17	18	19
35	—	13	14	15	16	17	19
40	—	12	13½	14	15	17	18
45	11	12	13	14	15	16	17
50	—	11½	12½	13½	15	16	17
55	—	11	12	13	14	15	16
3 00	10	11	12	13	14	15	16

929. Standard flashing reception exercise (Short title 'FRX')

a. Object. The standard flashing reception exercise is designed to assess accuracy in receiving flashing.

b. Conduct

(1) The exercise consists of three parts, made as follows:—

PART 1. A message, with a realistic short address, followed by a text of 52 letters and 28 figures mixed in 16 blocks of five characters each. The text is to be transmitted in three minutes five seconds, and is the only portion counted in the marking of Part 1.

PART 2. A heading, and four separate sets of coded signals, each set to consist of three signal groups, transmitted in six minutes. Heading and text are both counted in the marking of Part 2. The letters and numerals comprising a signal group are normally to be spelt out. The total number of characters in Part 2 is to be approximately 280.

PART 3. A message, with a realistic short address, followed by a text consisting of 30 words plain text. The text is to be transmitted in three minutes and is the only portion counted in the marking of Part 3.

(2) The separative sign 'ii' is to be made between each group of Part 1, and in the preamble and address of Parts 2 and 3.

(3) In Part 3 the average length of words must be five letters.

c. Marking

PART 1. Deduct $\frac{1}{2}$ mark for each letter or figure in the *text* read incorrectly; maximum error count—40.

PART 2. Deduct one mark for each letter, numeral or prosign incorrectly received, subject to a maximum of two marks for each signal group and six marks for the heading; maximum error count—30.

PART 3. Deduct one mark for each word of the text read incorrectly; maximum error count—30.

930. Standard semaphore reception exercise (Short title 'SRX')

a. Object. The standard semaphore reception exercise is designed to assess accuracy in receiving semaphore.

b. Conduct. The conducting ship transmits a message consisting of a heading and text of 25 words at 8 w.p.m. For purposes of this exercise, the total length of messages will be computed in accordance with the following rules:—

(1) Each punctuation sign (full stop, hyphen, pair of brackets, oblique stroke) counts as one word.

(2) Each word, group, or prosign in the preamble or address counts as one word.

(3) The attention, error, and numerical signs do not count as words.

c. Marking. Deduct four marks for each word, as defined above, read incorrectly. Maximum error count—100.

931. Standard VS reception exercise (Short title 'VRX')

A combination of a standard flashing reception exercise (FRX) and a standard semaphore reception exercise (SRX).

932. Standard VS transmitting exercise (Short title 'VTX')

(Combines semaphore transmitting exercise 'STX' and flashing transmitting exercise 'FTX'.)

a. *Object.* The standard VS transmitting exercise is designed to assess accuracy and style of transmitting flashing and semaphore.

b. *Conduct.* The exercise consists of three parts, made as follows:—

PART 1 (STX). 10 words of P/L by semaphore, made with hand flags in 75 seconds.

PART 2 (FTX). Five manoeuvring signals made on a directional light in two minutes.

PART 3 (FTX). 10 words of P/L by directional light in one minute.

c. *Marking*

(1) Marks are allotted as follows:—

PART 1 .. 30

PART 2 .. 40

PART 3 .. 30

(2) The rating is first marked for each portion of the test according to his general style and readability. The following table gives an indication of how marks should be allotted:—

	GOOD OPERATOR	FAIR OPERATOR	POOR OPERATOR	BAD OPERATOR
Semaphore	30-25	25-20	20-10	Below 10
Manoeuvring signals ..	40-35	35-25	25-15	Below 15
P/L by light	30-25	25-20	20-10	Below 10

(3) Further marks are then deducted for mistakes made as follows:—

For each uncorrected mistake	..	..	1
For each corrected mistake	..	..	$\frac{1}{2}$

933. Standard radar recognition exercise (Short title 'RRX')

a. *Object.* The standard radar recognition exercise is designed to assess and improve the ability of Radio Operators (W) to identify various types of radars.

b. *Conduct*

(1) RRX tapes are recorded at H.M.S. *Mercury* for use with service tape recorders operating at medium speed.

(2) Each exercise is made up of five parts, details of which are shown below.

(3) Answers should be written on special RRX forms, examples of which are held by FEWU's and H.M.S. *Mercury*.

(4) RRX tapes and answers will be supplied to ships and establishments by H.M.S. *Mercury* on request in exchange for the same number of old tapes.

(5) Exercises are only to be transmitted on an internal closed circuit.

c. *Marking*

PART 1. Total 5 marks.

1 mark for each correctly assessed PRF.

$\frac{1}{2}$ mark for a PRF assessed incorrectly but within ± 100 cps at PRF's up to 1,000.

$\frac{1}{2}$ mark for a PRF assessed incorrectly but within ± 200 cps at PRF's above 1,000.

PART 2. Total 50 marks (10 for each radar).

Correct identification of type .. 4 marks.

Correct identification of PRF .. 2 marks.

(If the PRF assessment is incorrect but within the limits of those in Part 1, 1 mark is to be given.)

Correct assessment of function .. 4 marks.

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PART 3. Total 10 marks.

2½ marks to be awarded for each correctly identified radar type.

PART 4. Total 27 marks (9 for each radar).

Correct frequency band	..	..	1 mark.
Correct PRF	..	..	2 marks.
Correct function	..	..	3 marks.
Correct ARP	..	..	3 marks.

PART 5. Total 8 marks.

Correct PRF	..	..	2 marks.
Correct type	..	..	3 marks.
Correct function	..	..	3 marks.

Note. New Entry and Conversion classes use Parts 1, 2 and 3 only, producing a total mark of 65. All other ratings use all parts, producing a total mark of 100.

934. Standard voice operating exercise (Short title 'VOX')

a. Object. The standard Voice Operating Exercise is designed to assess the ability to operate a Voice Net efficiently under operational conditions.

b. Conduct. The exercise consists of five procedural questions, one from each of the following parts:—

- Part 1. General operating, establishing a Net, transmitting types of messages, relaying etc., and operators' procedures.
- Part 2. Executive Method.
- Part 3. Intra R.N. Abbreviated procedure.
- Part 4. Enemy Reporting (to include Alarm Reports).
- Part 5. International procedure, Air/Ground procedure, and A.I.O. procedure as required by paragraph 262.

c. Marking

(1) TECHNIQUE

25 marks out of a total of 100 are allocated to technique and are to be awarded on the following scale.

20–25	..	..	Good Operator.
15–20	..	..	Fair Operator.
Below 15	..	..	Poor Operator.

(2) PROCEDURE AND ACCURACY

75 marks out of the total of 100 are allotted to the procedure and accuracy and are to be deducted for errors as follows:—

- (i) A major procedural/operating error 4 marks.
- (ii) A minor procedural/operating error 2 marks.
- (iii) A minor procedural/operating error that is quickly rectified .. 1 mark.
- (iv) An error in procedure that is corrected during transmission .. ½ mark.

935–950. Spare.

Section 3

951. Table of exercise to be read weekly by Communication ratings

TYPE OF EXERCISE	RATING	AVERAGE RESULT FROM PREVIOUS WEEK		NUMBER REQUIRED FOLLOWING WEEK	REMARKS
		SPEED	ACCURACY		
FRX	J.R.O. (T)	10 and 15	94 and over	1	See Note (i)
	R.O.3 (T)		Under 94, over 90	2	
			90 and under	3	
			90 and under for second successive week	6	See Note (ii)
	R.O.2 (T)	10 and 15	96 and over	1	See Note (i)
	L.R.O. (T)		Under 96, over 90	2	
			90 and under	3	
			90 and under for second successive week	6	See Note (ii)
VTX	J.R.O. (T)	10 and 15	80 and over	1	
	R.O.3 (T)		Under 80	2	
	R.O.2 (T)	10 and 15	85 and over	1	
VOX	L.R.O. (T)		Under 85	2	
	J.R.O. (T)	—	80 and over	1	Radio operators should take part when possible
	R.O.3 (T)		Under 80	2	
	R.O.2 (T)	—	85 and over	1	
NAV-COMEX 203/204 (AXP3)	L.R.O. (T)		Under 85	2	
	J.R.O. (T)	One of these exercises is to be carried out each week. Although designed for a number of ships, a worthwhile exercise may still be carried out in a single ship			Note (i) applies
	R.O.3 (T)				
	R.O.2 (T)				
	L.R.O. (T)				
MKX or MMX	J.R.O. (G)	22(MKX)	94 and over	1	See Notes (i) and (iii)
	R.O.3 (G)	18(MMX)	Under 94, over 90	2	See Note (iii)
			90 and under	3	
			90 and under for second successive week	6	See Notes (ii) and (iii)
	R.O.2 (G)	22(MKX)	96 and over	1	See Notes (i) and (iii)
			Under 96, over 90	2	See Notes (i) and (iii)
	L.R.O. (G)	18(MMX)	90 and under	3	See Note (iii)
			90 and under for second successive week	6	See Notes (ii) and (iii)

TYPE OF EXERCISE	RATING	AVERAGE RESULT FROM PREVIOUS WEEK		NUMBER REQUIRED FOLLOWING WEEK	REMARKS
		SPEED	ACCURACY		
MSX	J.R.O. (W)	22	98 and over Under 98, over 96	1	See Note (i)
	R.O.3 (W) R.O.2 (W)		Under 96, over 92 92 and under	2 3	
	L.R.O. (W)	25	92 and under for second successive week	4	See Note (ii)
				8	
RRX	J.R.O. (W)	—	80 and over	1	See Note (i)
	R.O.3 (W)		Under 80, over 70	2	
	R.O.2 (W)		Under 70, over 60	3	
	L.R.O. (W)		60 and under	4	
	J.R.O. (T)	30 and over	94 and over	1	See Notes (i), (iv) and (v)
	J.R.O. (G)	Under 30, over 25	Under 94, over 90	2	See Notes (iv) and (v)
	R.O.3 (T)	25 and under	90 and under	3	See Notes (iv) and (v)
	R.O.2 (T)	25 and under for second successive week	90 and under for second successive week	6	See Notes (ii), (iv) and (v)
	R.O.2 (G)				
BKX/ TTX	L.R.O. (T)	35 and over	96 and over	1	See Notes (i), (iv) and (v)
	(Prov.)	Under 35, over 30	Under 96, over 90	2	See Notes (iv) and (v)
	L.R.O.	30 and under	90 and under	3	See Notes (iv) and (v)
	(Prov.)	30 and under for second successive week	90 and under for second successive week	6	See Notes (ii), (iv) and (v)
	L.R.O. (T)	40 and over	96 and over	1	See Notes (i), (iv), (v) and (vi)
		Under 40, over 30	Under 96, over 90	2	See Notes (iv), (v) and (vi)
	L.R.O. (G)	30 and under	90 and under	3	See Notes (iv), (v) and (vi)
		30 and under for second successive week	90 and under for second successive week	6	See Notes (ii), (iv), (v) and (vi)
WT PROCEDURE PRACTICAL (e.g., NAV- COMEX 402)	J.R.O. (G) R.O.3 (G) R.O.2 (G)	J.R.O., R.O.3 and R.O.2 are to take part in at least one exercise per week in working hours. The exercise should last at least one hour, and as well as practising procedure should aim at giving junior ratings confidence on the key with good morse technique			Note (i) applies
FREQUENCY CHANGING EXERCISE	R.O.3 (G) R.O.2 (G)	Two per month on each type of HF and MF equipment fitted		—	Note (i) applies

TYPE OF EXERCISE	RATING	AVERAGE RESULT FROM PREVIOUS WEEK		NUMBER REQUIRED FOLLOWING WEEK	REMARKS
		SPEED	ACCURACY		
(NAV-COMEX 404)	L.R.O. (G)	One per month on each type of HF and MF equipment fitted		—	Note (i) applies
CRYPTO	J.R.O. (T) J.R.O. (G) R.O.3 (T) R.O.3 (G) R.O.2 (T) R.O.2 (G)	One Exercise per week in Primary Crypto System—De-cryption		In addition. Practical exercises in Secondary Systems and Low Grade Codes are to be carried out once per month	
	L.R.O. (T) L.R.O. (G)	One Exercise per week in Primary Crypto System ENCRYPTON			

Notes.—(i) The number of exercises to be read can be reduced to one per month at the discretion of the Communications Officer, if in his opinion the rating shows that by the operation of live systems, he is up to the standard required for his rate.

(ii) Three exercises to be carried out in working hours, and three out of working hours. (With the MSX, for three exercises read 4 exercises in each case.)

(iii) The MKX is to be carried out if a keyboard machine is available.

(iv) In the case of keyboard exercises, the required results must be obtained in both speed and accuracy. Failure at either reduces the overall result to the lower figure.

(v) TTX are to be carried out by all rates whenever Teletypewriters are available. The number of exercises to be read the following week is to be based on the combined average achieved in all keyboard exercises.

(vi) The 40 w.p.m. standard is applicable only to leading rates who have qualified at this speed during the course for Leading rate. Leading rates not so qualified are to follow the scales laid down for the Provisional rate.

(vii) ALL L.T.Os. and below are to read a minimum of one SRX per month provided they have reached a speed of 8 w.p.m. This number should be increased as necessary to maintain accuracy at the following standards:—

J.R.O. (G) and (T) and R.O.3 (G) and (T) 92 per cent.

R.O.2 (T) and L.R.O. (T) 96 per cent.

952. Exercises to be carried out weekly by W.R.N.S. Communication Ratings

W.R.N.S. Communication ratings soon lose their practical communication standards if regular communication exercises are not carried out. In order that requisite standards are maintained exercises are to be read in accordance with the following table. These exercises are particularly important in the case of W.R.N.S. Communication ratings employed outside the Communication Branch.

TYPE OF EXERCISE	RATING	SPEED	ACCURACY	NUMBER REQUIRED FOLLOWING WEEK	REMARKS
TTX/TPX	Leading Wren Communication	40 and over	96 and over	1	See Notes (i) and (ii)
		30 and over	Under 96, over 90	2	
		Under 30	90 and under	3	
BKK or TTX/TPX	Wren Communication and Wren Communication (M)	40 and over	94 and over	1	See Notes (i) and (ii)
		30 and over	Under 94, over 90	2	
		Under 30	90 and under	3	
MMX/MKX	Wren Communication (M)	22 or	96 and over	1	See Note (i)
		18	Under 96, over 90	2	
			90 and under	3	

Notes :—

- (i) The number of exercises to be read per week can be reduced to one per month at the discretion of the Communications Officer, if in his/her opinion the rating shows by the operation of live systems she is up to the required standard for her rate.
- (ii) The required result must be obtained in both Speed and Accuracy. Failure at either reduces the overall result to the lower figure.

Section 3

951. Exercises to be Read Weekly by Long Service Ratings

Practical exercises to be read by long service communication ratings are detailed in the following table. Regular practice is the only way to maintain a high standard of operating, and it is essential that ships' Communication Officers see that the required number of exercises are read. In dockyard ports and whilst in company, the senior officer present is responsible for arranging a weekly exercise programme; ships on detached duty must make their own arrangements. Attention is drawn to paragraph 137.

TYPE OF EXERCISE	RATING	AVERAGE RESULT DURING PREVIOUS WEEK		NUMBER REQUIRED FOLLOWING WEEK	REMARKS
		SPEED	ACCURACY		
FRX	J.R.O. R.O.3	10	94 and over	1	See Note (i).
			Under 94, over 90 ..	2	
			90 and under	3	
			90 and under for second successive week.	6	See Note (ii).
	R.O.2 R.O.2 (G) (T) (W). L.R.O. (G) (T) (W).	10	96 and under	1	See Note (i).
			Under 96, over 90 ..	2	
			90 and under	3	
			90 and under for second successive week.	6	See Note (ii).
FTX	J.R.O. R.O.3	10	80 and over	1	See Note (i).
			Under 80	2	
			90 and over	1	See Note (i).
			Under 90	2	
	R.O.2 R.O.2 (G) (T) (W). L.R.O. (G) (T) (W).	10	90 and over	1	See Note (i).
			Under 90	2	
			90 and over	1	See Note (i).
			Under 90	2	
SRX/STX	R.O.2 (T) L.R.O. (T)	8	—	—	See Note (iv).
MMX	J.R.O. R.O.3	18	94 and over	1	See Note (i).
			Under 94, over 90 ..	2	
			90 and under	3	
			90 and under for second successive week.	6	See Note (ii).
	R.O.2 R.O.2 (T) (W). L.R.O. (T) (W).	18	96 and over	1	See Note (i).
			Under 94, over 90 ..	2	
			90 and under	3	
			90 and under for second successive week.	6	See Note (ii).
	R.O.2 (G) L.R.O. (G)	22	96 and over	1	See Note (i).
			Under 96, over 90 ..	2	
			90 and under	3	
			90 and under for second successive week.	6	See Note (ii).

951. Exercises to be Read Weekly by Long Service Ratings—continued

TYPE OF EXERCISE	RATING	AVERAGE RESULT DURING PREVIOUS WEEK		NUMBER REQUIRED FOLLOWING WEEK	REMARKS	
		SPEED	ACCURACY			
MSX	R.O.2 (G) L.R.O. (G)	22	98 and over	1	See Note (i).	
			Under 98, over 96 ..	2		
			Under 96, over 92 ..	3	See Note (ii).	
			92 and under	6		
	R.O.2 (W) L.R.O. (W)	18	98 and over	1	See Note (i).	
			Under 98, over 96 ..	2		
			Under 96, over 92 ..	3	See Note (ii).	
			92 and under	6		
RRX	R.O.2 (W)		75 and over	1		
			Under 75, over 70 ..	2		
			Under 70, over 65 ..	3		
			Under 65	4		
	L.R.O. (W)		80 and over	1		
			Under 80, over 75 ..	2		
			Under 75, over 70 ..	3		
			Under 70	4		
BKX/TTX	J.R.O. R.O.3	30 and over	94 and over	1	See Notes (i) and (iv).	
		Under 30, over 25 ..	Under 94, over 90 ..	2		See Note (iv).
		25 and under	90 and under	3		
		25 and under for second successive week.	90 and under for second successive week.	6		See Notes (ii) and (iv).
	R.O.2 R.O.2 (G) (T) (W).	30 and over	96 and over	1	See Notes (i) and (iv).	
		Under 30, over 25 ..	Under 96, over 90 ..	2		See Note (iv).
		25 and under	Under 90	3		
		25 and under for second successive week.	Under 90 for second successive week.	6		See Notes (ii) and (iv).
	L.R.O. (G) (T) (W).	40 and over	96 and over	1	See Notes (i) and (iv).	
		Under 40, over 35 ..	Under 96, over 90 ..	2		See Note (iv).
		35 and under	Under 90	3		
		35 and under for second successive week.	Under 90 for second successive week.	6		See Notes (ii) and (iv).
CRYPTO	J.R.O. R.O.3 R.O.2	One exercise per week in Primary Crypto System—encryption. In addition, practical exercises in Secondary Systems and Low Grade Codes are to be carried out, one per month.				
	R.O.2 (G) (T) (W). L.R.O. (G) (T) (W).	One exercise per week in Secondary Crypto System—encryption/decryption.				

R.O.1s are required to read the same exercises as those laid down for the Leading rates of their sub-specialisation.

Notes.—(i) The number of exercises to be read can be reduced to one per month at the discretion of the Communication Officer, if in his opinion the rating shows that by the operation of live systems, he is up to the standard required for his rate.

(ii) Three exercises to be carried out in working hours, and three out of working hours.

(iii) TTX are to be carried out by all rates whenever teletypewriters are available. The number of exercises to be read the following week is to be based on the combined average achieved in all keyboard exercises.

(iv) R.O.2 (T)'s and L.R.O. (T)'s are to read a minimum of one SRX and to transmit a minimum of one STX per month once they have reached a speed of 8 w.p.m. This number should be increased as necessary to maintain accuracy at 96 per cent.

APPENDIX I

S.1328

(Established December 1962)

PART I CHOICE OF SUB-SPECIALISATION IN THE COMMUNICATION BRANCH

Name Where Serving

Official Number Date of Passing for R.O.2

2. *Rating's order of preference for sub-specialisation in Tactical, Radio or Electronic Warfare.*
Ratings are not bound to express a preference, or may complete line 1 only.

(1)

(2)

(3)

3. *Commanding Officer's Remarks.* Commanding Officer's remarks should be framed to assist the selecting authority in allocating the rating to the most appropriate branch based on his ability, aptitude and keenness.

The Commodore Naval Drafting (Two Copies)

Commanding Officer

Date

PART II

The Commodore Naval Drafting,
Lythe Hill House,
Haslemere, Surrey.

Name

Official Number

The above-named rating has been selected to sub-specialise in

.....

(T), (G) or (W)

The Captain,
H.M.S. *Mercury*.
(Copy to)
The Commanding Officer,
H.M.S.

9-3

RESTRICTED

INSTRUCTIONAL FILMS AND FILM STRIPS

Section 1

INTRODUCTION

1001. General

A comprehensive range of instructional films, film strips and slides on communication subjects has been built up in order to achieve the following aims:—

- (1) Provide improved visual aids and standard teaching guides for communication instructions generally.
- (2) Provide better facilities for pre-advancement courses and training of ratings in ships.
- (3) Provide improved facilities for training of Reserve communication officers and ratings.
- (4) Provide suitable facilities for the rapid training of communication ratings in the event of mobilisation.

1002. Catalogue

The Catalogue of Naval Instructions Films and Film Strips (B.R. 1251) contains full details of all films, film strips and slides available to the Royal Navy. Details of their distribution are given in the A.F.O. introducing each film, film strip and slide into the Royal Navy. However, for ease of reference, the titles of films, film strips and slides available for communication training at present in distribution or under production, and the allowance to film libraries and ships and establishments concerned with communication training are shown in Section 2 of this chapter.

1003. Slides

A number of slides are now in production, details of which are found in Section 2. The slides have been made from wall diagrams already distributed to training centres and establishments.

1004. Distribution

Distribution of film strips and slides shown in Section 2 as 'under production' will be promulgated by A.F.O. in due course, and will be made initially without demand, as they become available.

Ships commissioning should demand copies of film strips from the Superintendent, R.N. Store Depot, Copenacre and slides from the Training Aids Officer, H.M.S. *Mercury*.

1005. Obtaining copies on loan

Copies of films, film strips and slides not allowed by establishment can normally be obtained on loan from film libraries in accordance with the instructions in B.R. 1251.

1006. Projectors

Existing resources of film and film strip projectors should be used. Demands for any additional equipment required should be forwarded in accordance with the instructions in B.R.4, Article 0607.

1007. Notes on the use of films, film strips and slides

The following notes are provided for the guidance of Communication officers and ratings who may not be familiar with the capabilities of this instructional media.

- (1) The films are intended for use either as an introduction to certain syllabi or for consolidation at later stages of a course. The instructor must be prepared to introduce the film and to make some amplifying remarks after the showing. He should allow time for questions and discussion.
- (2) The film strips are provided to give the instructor the benefit of a first class visual aid and to assist him in marshalling and presenting his facts in a logical and straightforward sequence. They in no way replace the instructor who must develop and improve his technique to make best use of the teaching staff.
- (3) Detailed teaching guides are provided with each film strip, giving outline lecture notes for each picture frame. These notes should be used in preparing the lecture, but should not normally be referred to during the lecture. The instructor should never read them out parrot fashion while showing the strip.
- (4) In the case of the picture slides the instructor should view the slide prior to giving any instruction to ensure he is fully conversant with all the slide portrays.
- (5) Satisfactory results can be obtained using film strips and slides for small classes in ships by projecting the picture onto any clear space on the bulkhead or sides of a compartment. A special screen is not essential, although it does give a clearer picture. The compartment need not be darkened, provided that the picture area is screened from direct light.
- (6) In shore establishments particularly good results can be obtained with film strips by using rear projection screens in an undarkened room. The class can then refer to their books and take notes if they wish. A 300-watt projector should be used, if available.
- (7) Attention is drawn to the following publications:—

B.R. 1242. *How to use the Film Strip.*

B.R. 1741. *Instructional Technique.*

Section 2

ALLOWANCES OF FILMS AND FILM STRIPS

1008

Films (Admiralty produced)

SERIAL NO.	TITLE	CLASSIFICATION	CARRIERS	CRUISERS AND DARINGS	DEPOT SHIPS	S.O. DESTROYER AND FRIGATE SQDN.	H.M.S. <i>Mercury</i>	S.T.C. CHATHAM	S.T.C. DEVONPORT	S.T.C. MALTA	S.T.C. KRANJI	H.M.S. <i>Ganges</i>	H.M.S. <i>Dolphin</i>	H.M.S. <i>Dryad</i>	NAVAL AIR STATIONS	BRITANNIA R.N.C.	R.N.R. DIVISIONS	R.N.R. CENTRES	SEA CADET AND SEA SCOUT UNITS	FIRST CLASS FILM LIBRARIES	SECOND CLASS FILM LIBRARIES
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
A 452	PRACTICAL VISUAL SIGNALLING	U					1	1				1					1		✓	X	
A 607	BASIC FLEETWORK Part 1—Leaving harbour and simple formations Part 2—Circular formations, screens and flight operations	C					1	1	1	1	1	1		1		1	1			X	
A 608	SOMEBODY'S LISTENING NOW*	C					2	1	1	1	1	1				1	1			X	
A 624	INTRODUCTION TO NAVAL COMMUNICATIONS ERRORS ARE EXPENSIVE	U					2	1	1	1	1	1		1		1	1		✓	X	
A 665	THE RISKS YOU RUN	C					2							1		1				X	X

* One copy to J.A.S.S.

One copy to R.N. Tactical School.

RESTRICTED

Film strips (Admiralty produced)

RESTRICTED

10-5.

[illegible]

1009

Film strips (Admiralty produced)—continued

SERIAL NO.	TITLE	CLASSIFICATION	CARRIERS	CRUISERS AND DARINGS	DEPOT SHIPS	S.O. DESTROYER AND FRIGATE SQDN.	H.M.S. <i>Mercury</i>	S.T.C. CHATHAM	S.T.C. DEVONPORT	S.T.C. MALTA	S.T.C. KRANJI	H.M.S. <i>Ganges</i>	H.M.S. <i>Dolphin</i>	H.M.S. <i>Dryad</i>	NAVAL AIR STATIONS	BRITANNIA R.N.C.	R.N.R. DIVISIONS	R.N.R. CENTRES	SEA CADET AND SEA SCOUT UNITS	FIRST CLASS FILM LIBRARIES	SECOND CLASS FILM LIBRARIES
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
SA 447	THERMIONIC VALVES Part 1—The diode Part 2—The triode Part 3—The tetrode and pentode Part 4—Grid bias and classes of amplification Part 5—Intervalve coupling	U					1													X	
SLA 483	RADIO AERIALS (PARTS 1 AND 2)	U					1														
*SA 609	RADIO COMMUNICATION ORGANISATION .. Part 1—World wide and station Part 2—Tactical Part 3—Merchant ship Part 4—Convoy Part 5—Ground/air Part 6—Ship/air Part 7—Local	R	1	1	1	2	3	2	2	1	1	1	2	1		1	1	1		X	1
SA 610	ALLIED NAVAL MANOEUVRING INSTRUCTIONS Part 1—Organisation and command Part 2—Manoeuvring definitions Part 3—Special manoeuvring rules Part 4—Stationing Part 5—Line formations Part 6—Operational formations Part 7—Altering course Part 8—Screens	C	1	1	1	2	2	2	2	1	1	1	1	1		2	1			X	

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
SA 611	AUTOMATIC TELEGRAPHY AND SHORE STATION EQUIPMENT Part 1—Introduction Part 2—Telegraphy theory Part 3—Line telegraphy Part 4—Radio telegraphy Part 5—Shore station equipment	R					1	1	1	1	1									×	
SA 623	RADIO PROPAGATION Part 1—Principles Part 2—Propagation of ground waves and H/F Part 3—Propagation of VHF and UHF	R					2	1	1	1	1	1	1	1	1	1	1			×	
SA 660	FLAG RECOGNITION Part 1—Simple meanings Part 2—Simple meanings Part 3—Basic manoeuvring	U					3	1	1	1	1	1	1			1	1		✓	×	
SA 663	CONVOY WORK Part 1—Allied control of shipping and convoy organisation Part 2—Convoy manoeuvring Part 3—Convoy signals	C	1	1	1	2	2	1	1	1	1	1	1	1	1	1	2	1		×	
SA 664	RADIO WARFARE—TACTICAL RADIO SEARCH	C						2	1	1	1	1	1			1	1	1		×	
SA 1078	DISTRESS, SEARCH AND RESCUE, SUB-MISS/SUBSUNK COMMUNICATION	C	1	1	1	1	2	1	1	1	1	2	1	1	1	1	1	1	×	×	
SA 1086	RECONSTRUCTION OF SINKING	C	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SA 1086	CEREMONIAL Part 1—Recognition Part 2—Situation	U	1	1	1	1	2	1	1	1	1	2				2				×	×
SA 1114	INTRODUCTION TO RATT	R	1	1	1	1	2	1	1	1	1	1					1	1		×	×

Notes.— (i) A tick (✓) in column 20 indicates that the film/film strip may be borrowed from the libraries by Sea Cadet and Sea Scout Units.
(ii) × in columns 21 and 22 indicates that the appropriate film or film strip is held by these libraries.

~~Production October, 1958~~

Up to date versions of Parts 1 and 2 being produced May, 1961.

1010. Slides (Admiralty Produced)

- (a) The following slides will be supplied without demand, to ships of the active fleet and all communication training centres and establishments.
- (b) Ships on paying off or undergoing long refit should return their slides to the Superintendent, R.N. Store Depot, Woolston.

(Change No. 7.)

- SLA 1219 W3 (1) Introduction to Tactical Radio Communications.
(2) Surface Tactical Nets, Command Reporting Nets, General Nets.
(3) Co-ordination Nets.
- W3A (1) Air Control Nets.
(2) Convoy and Maritime Air Nets.
- SLA 1418 Radio Tree.
- SLA 1419 (1) Nomenclature of Radio Bands and their uses (1)
(2) " (2)
(3) Propagation (1)
(4) " (2)
- SLA 1420 (1) Merchant Ships Wireless Areas and Density of Shipping (1)
(2) Merchant Ships Wireless Areas and Density of Shipping (2)
(3) Radio Telegrams to, from and between Ships (1)
(4) " (2)
(5) " (3)
(6) Merchant Ship Organisation, Transition from Peace to War
- SLA 1421 (1) Relationship of Communication Publications (1)
(2) " (2)
- SLA 1422 (1) Propagation—Types of Waves
(2) " MF and LF
(3) " HF
(4) " VHF and above
(5) " Combined Diagram
(6) " Forward Scatter and UHF
- SLA 1423 (1) Responsibilities of the Communication Officer
(2) Responsibilities of the Originator
(3) Degrees of Precedence
(4) Security Classification (1)
(5) " (2)
(6) " (3)
(7) " Combined

- SLA 1424
- (1) F.S.K. Drive Unit, G.K. 185A.
 - (2) Type 692. Modulator Unit.
 - (3) Typical Layout of a RATT Bay.
 - (4) HF/UHF RATT Power Supplies.
 - (5) Example of an F.S.K. Signal Applied to B40D.
 - (6) Converter-Comparator Block.
 - (7) Converter Unit.
 - (8) Comparator Unit.
 - (9) HF RATT D.C. Loop Circuit.
 - (10) Radio Teletype Terminal Set.
 - (11) UHF (Intership) RATT D.C. Loop Circuit (Simplified).
- SLA 1434
- (1) Alteration of Course by Turning together (Bent Line Screen).
 - (2) Reorienting the axis of a Bent Line Screen less than 110° by Method Rum.
 - (3) Reorienting the axis of a Bent Line Screen 110° or more by Method Rum.
 - (4) Reorienting the axis of a Bent Line Screen by Method Coke.
 - (5) Reorienting the axis of a Horseshoe Screen by Method Coke.

1011. Films (not Admiralty produced) found useful for training in H.M.S. Mercury

SERIAL No.	TITLE	SYNOPSIS
F.772	They're called electrons	Explains the nature of electrons and their action in radio valves.
MA.2031A	Vacuum tubes Part 1	Electron theory and the Diode tube.
	Part 2	Triode and multipurpose tubes.
MN.8222	Flag hoisting and manoeuvres (colour)	Basic flag-hoists and simple manoeuvres.
TF 11-1632	The effects of the Ionosphere on radio wave propagation	Explains the various aspects of propagation.