

I. F. F. NOTES

INTERROGATION OPERATING PROCEDURE.

The process of correlating an I.F.F. response with the corresponding echo is one which requires some care, partly because of the range discrepancy which always exists between the target's echo and its response. This range discrepancy arises from the delay which occurs in the transponder. This varies with :

- (a) The type of radar set. The interrogator is fired before the radar transmitter in order to correct the delay, but the amount of pre-firing that is possible depends on the radar set.
- (b) The transponder being interrogated.
- (c) The range of the transponder. There is a small difference between the range discrepancy at long and short ranges.

The delay may amount to 1000 yards with Type 291 but, in all other cases, it should not be more than 400 yards. If any doubt arises as to which response belongs to a particular echo, the relative movement of the two should be carefully checked. The range difference between the target's echo and its response should of course be constant.

The following notes on interrogation operating procedure may prove helpful :-

Types 281 and 277 using Panel L43. (Outfit JH2).

- (i) Turn the Aerial Control on the Sector Selector to the bearing of the target.
- (ii) Move the strobe to the range of the echo.
- (iii) Switch on the interrogator and observe the range of the response relative to the strobe.

Types 276 and 293 using Panel L43. (Outfit JH1).

- (i) Turn the Sector Selector in the centre of the T.I.U. to the bearing of the target.
- (ii) Identify the target by its range on the Panel L43.
- (iii) Switch on the interrogator and observe the range of the response relative to the target echo.

Types 276, 277 and 293.

Interrogation on the A scan in the Radar Office.

- (i) Move the strobe to the range of the target and line it up with the echo as the aerial passes through the target bearing.
- (ii) Turn the interrogator aerial to the bearing of the target.
- (iii) Switch on the interrogator and observe the range of the response relative to the strobe.

Type 281 fitted with Type 243Q.

Interrogation on the A scan in the Radar Office.

- (i) Turn the interrogator aerial to the target bearing.
- (ii) Identify the target as the radar aerial passes through its bearing.
- (iii) Switch on the interrogator and observe the range of the response relative to the range of the target echo.

Type 281 (fitted with Type 243), Type 79 & Types 271/2/3.

- (i) Turn the radar aerial and interrogator aerial together to the bearing of the target.
- (ii) Switch on the interrogator and observe the range of the response relative to the range of the target.

Note :- If a strobe is fitted with Types 271/2/3 this may be used to mark the target echo.

Type 291.

- (i) If Outfit RTA is fitted, move the strobe to coincide with the target.
- (ii) Switch on the interrogator and match the range of the response against the range of the target echo.

Note :- In each case the interrogator should only be switched on when required and should be left on for as short a time as possible. The more your interrogator is on, the more unlocked responses will appear on the scans of other interrogators to confuse the operator.

Type 253P.

One of the difficulties in obtaining satisfactory operation of Type 253P is that of ensuring that all interrogators and transponders are set up on the correct frequency. Crystal controlled wavemeters Type W1649 (A.M. Ref. OT/6045) are now available at all main bases for checking of subsidiary wavemeters such as W1310. W1649 will be supplied to Cruisers and above as soon as stocks permit. Meanwhile, the following proposal by H.M.S. BELLONA for standardising the frequency in a group of ships operating together is worthy of trial.

"The following interim scheme to standardise the interrogating frequency within the Fleet is suggested as one of several alternatives that could be devised.

- (a) The senior ship transmits continuously on Type 242 set up as accurately as possible on the correct frequency.
- (b) No other interrogator is allowed to be operating.
- (c) The remaining ships adjust their Type 253P until the highest pitched signal is heard in the monitoring headset.
- (d) Ships measure the frequency of Type 253P on wavemeter W1310, and use the reading obtained to tune their Type 242, straight away under the same conditions. Check that the Type 242 receiver, when tuned to the transmitter, also corresponds to maximum response from Type 253P.

- (e) Finally, the senior ship should allocate a period to each ship weekly, and in good time before sailing on an operation, for a 'both ways' Type 253P trial.

It will be difficult to perform operation (c) in the case of ships too close (within 3 miles) to the senior ship. A permanent set situated ashore would overcome this problem.

Aerial Insulation of Type 253/P.

Have you seen A.F.O. 2750 ?

A. S. E. FAMILY TREES

On pages 67, 68, 69 and 70 will be found "family trees" which show the allocation of duties within A.S.E.

It is hoped that the information contained therein will be of use to Radio personnel who have occasion to ring up Haslemere 1080 with queries, complaints - or compliments !

Visitors to A.S.E. - there is an open invitation to all Signal and Radio Officers - will also it is hoped, find these charts useful.

It will be noticed that the charts are anonymous and that telephone extension numbers are not given. This is intentional as personnel and telephone numbers are liable to change. It is of course only necessary to ask for the "tally" (i.e. B3.3 if you want the Editor) to be put into touch with the appropriate officer.

"B" DEPARTMENT (RADAR)

COMMANDER "B" - COMMANDER A. V. S. YATES, R. N.

FIRE CONTROL

B7

Target Indication
G.A.P.
LRS1.
992

LIAISON

V.L.O.

Liaison with "VERNON"

W.O.L.O.

Liaison with War Office

SHORE STATIONS
TEST EQUIPMENT

B1

Test Equipment.
New Developments.
Equipment Improvement.
Dominion & Foreign
Radar (not U.S.).
Interference.
Propagation.

B1.1

960S/980S/981S
Navigational
Beacons.
277F.
Test Equipment.

B1.2

R.N.A.S. Radar.
Mobile Radar Vans.
Shore Aircraft
Beacons.
Shore Aircraft
Blind Approach.
277S.
G.C.I.

IDENTIFICATION AND
NAVIGATIONAL AIDS

B3

Interrogators and
Associated Equip-
ment.
242/3, JH. 941,
253.

B3.1

COASTAL WARFARE
COMBINED OPERATIONS
TORPEDO CONTROL (NOT S/M)

B4

Fleet Destroyers.
Coastal Craft.
Combined Ops. Ships and
Craft.

B4.1

Combined Ops.
Ships & Craft.
970, 971.
255/M.
951, 952.
S013.

B4.2

Coastal Craft
268.

B3.3

B8.1

TACTICAL

BX

Capital Ships and Cruisers.
Enemy Radar.

& SUBMARINE WARFARE
TACTICAL QUESTIONS
(SMALL SHIPS)

B8

Marines and S/M
ot Ships.
/MW/PW.

AIR WARFARE
TACTICAL QUESTIONS
B9

Carriers.
960, 79.
SM1, SP.

B9.1

AIC (RDR)
980, 981,
Remote
Displays.

B9.2

SK, SC2
WA Teachers.
AEW
FD Liaison
HRD, HRG.

B9.3

Knobbly.
281
Series.

B8.2

byers.
ces.
hips.
(Not A.A.)
(Not A.A.)
, 273Q.
adar.

Minesweepers.
Minelayers.
Trawlers.
Monitors.
Depot Ships,
(Not S/M)
Maintenance Ships.
286, 291/W/M.

ficer to
trials
lication

B7.6
Assistant to
Cdr. 'B'.
282/3/4/5.
Radar Training
Sight.

B7.7
931.

Navigational Aids.
Beacons and
Transponders.

251.
257.
942.
953.
Blind Approach.

Liaison with
H.M.S. COLLINGWOOD.
A.S.E. BULLETIN
(Editor).

I.F.F. Trials.
Merchant Ships.
Cable Ships.
Portable and After
Action Sets.
Tool Outfits.

A/S Destro
Corvettes.
Coastal Fo
Control Sh
Frigates (
Sloops (No
271Q, 277,
972.
U.S. WS Ra

B7.1

RMR.
262.
930.

B7.2

275, 274.
U.S. Fire Control
Radar.

B7.3

A.A. Sloops and
Frigates.
Teachers & Trainers.
276/293.
271P/272P/273P.
HRB/HRF.
Offices,
Furniture & Fittings.

Internal Communications.
Gyro Compass circuits.
Electrical Instruments,
reflectors & Calibration
Marks. Lining Up Balloons.
Liaison with D.N.O. & D.E.E.
900.
Target Indication Rooms.
Ranging Outfits, including
Panel L37 and R.T.U's.

B7.5

Trials Off
arrange
for Appl
Staff.

B7.1.1

930

B7.1.2

262 Trials.

'A' DEPARTMENT (COMMUNICATIONS)

Cdr. A - Commander A.D. Lenox-Conyngnam R.N.

A1. Reception

Receivers.
Aerial Exchanges and
receiver feeders.
Television.
Wavemeters.
Test Equipment.
R.I.S.
Submarines.
S.R.E., Wa/T and
Loudhailers -
Liaison with D.E.E.
Scramblers.

A5. Fleet Air Arm.

F.A.A. Liaison.
R.A.F. Liaison.
U.S. Liaison.
Air Beacons.
Helicopters.
Records.
All trials.
Frequency Allocation.

A2. Transmission

Transmitters, Transmitter
trunks and feeders.
Transceiver equipments.
Portables.
Crystals.
Proprietary equipment.
Distant Control.
Propagation.
Army Liaison.

A.2.1.

Proprietary
Equipment.
B.R.299.

A.2.4.

Distant Control.

A3. Installation

Staff Requirements.
Refits and A's & A's.
Equipment Reports.
Coastal Craft.
Lay-outs (except
submarines).
Aerial arrangements
and policy.

A6. Control Circuits
Power Supplies &
Maintenance Policy.

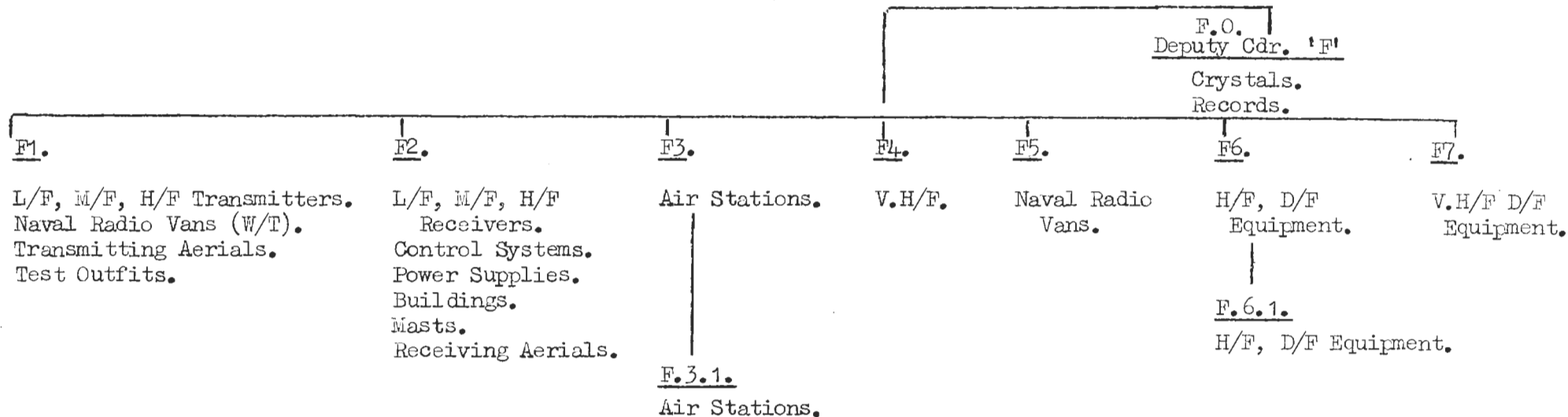
Control Circuits.
Power Supplies.
Audio.
R/T Trainers.
Maintenance.
Tool Outfits.
Radio Maintenance Rooms.
W/T hazards.

A4. Navigation

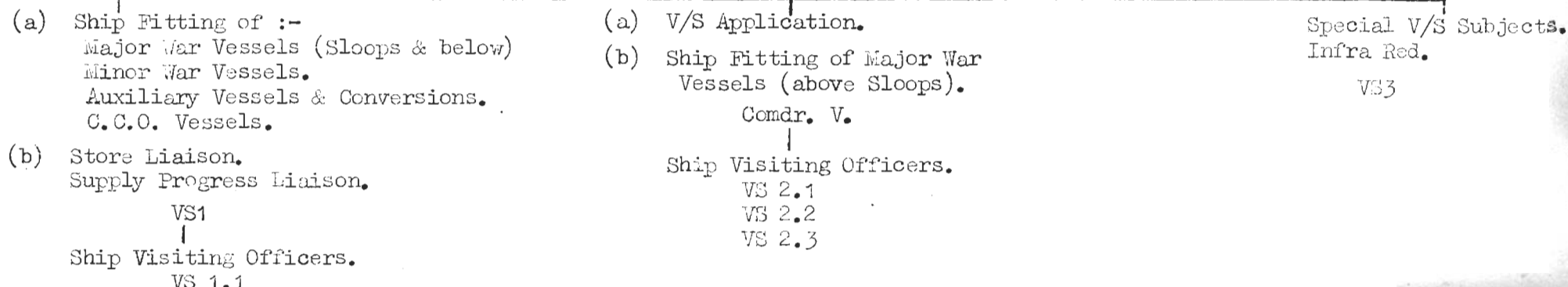
Nav. Aids.
A.I.O.
Liaison with
Navigation and
Compass Depts.

'F' DEPARTMENT (SHORE STATIONS,
AIR STATIONS, MOBILE STATIONS).

Commander F - Commander J.W. Mc.Clelland, R.N.



Commander V. - Commander W.C. Brinton R.N.



DEPARTMENT

MANDER C. V. ROBINSON, R.N.

M1

RADAR

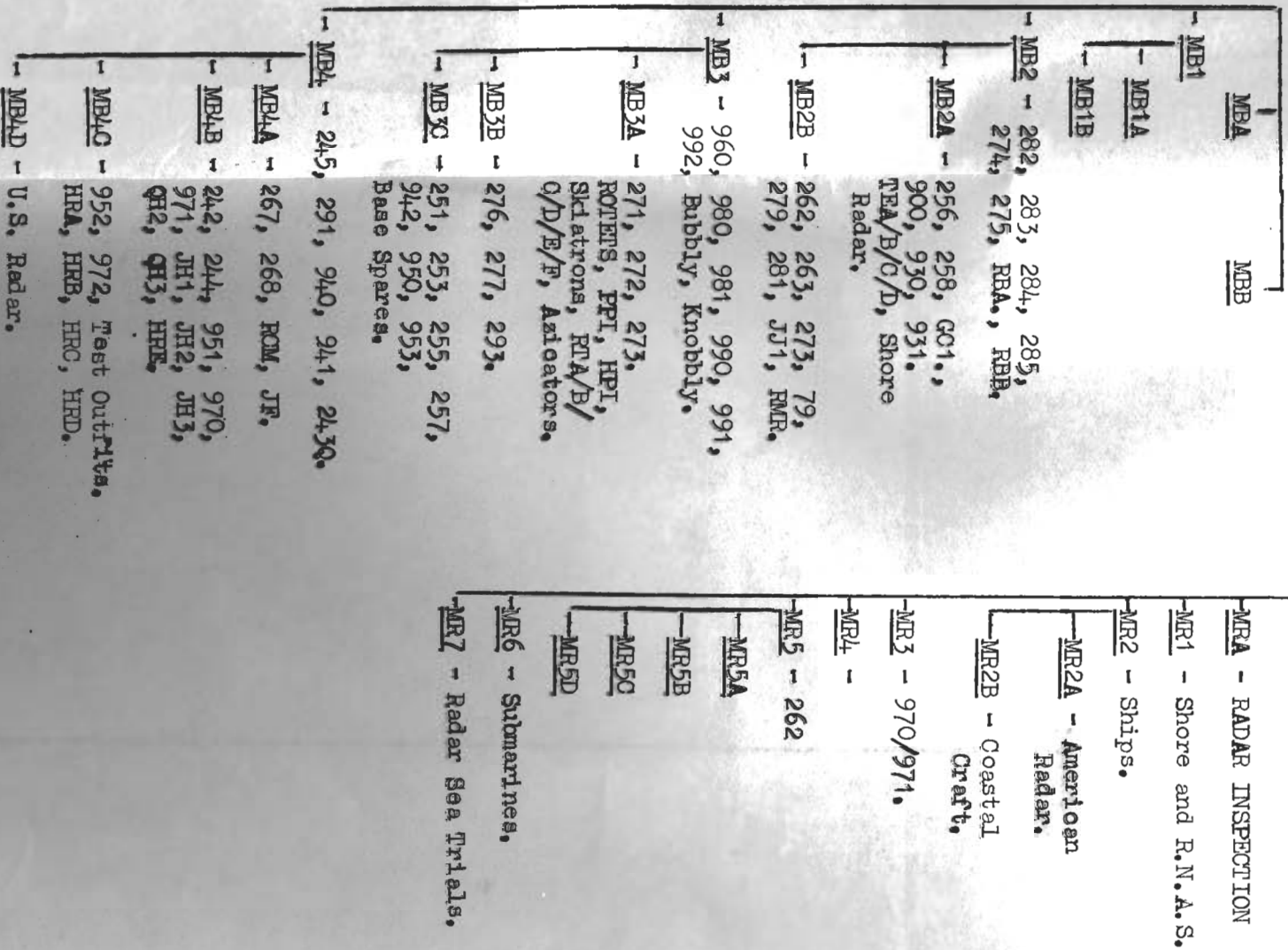
RADAR SUPPLY PROGRESS

MB

MR

RADAR FITTING

ets.



HANDBOOKS

Page 71.

LIST OF CURRENT A.S.E. PUBLICATIONS ISSUED AS CONFIDENTIAL BOOKS BY M BRANCH.

<u>Book No.</u>	<u>Subject Matter.</u>
C.B.4217(42)	D/F Outfit FM9/10
C.B.4227	D/F Outfit FH3
C.B.4228	D/F Outfit RH1 with Rec.B21A
C.B.4389	H/F D/F Outfit RH2 (Ship Outfits)
C.B.4283	D/F Outfit FH4X
C.B.4333 & (A)	D/F Outfit FH4
C.B.4268	D/F Outfit FV1
C.B.4323	D/F Outfit FV3
C.B.4346	D/F Outfit FH3 with Rec. B21B.
C.B.4353	D/F Outfit FV4
C.B.4180(A)(B)(C) (D)(E)	R.D.F. Operating Procedure.
C.B.4219(1)	Radio Theory as applicable to Types 282/3/4/5.
C.B.4219(2)	Elementary Explanations of some Radar Circuit Devices.
C.B.4224(44)	Height Finding by Radar.
C.B.3130	General Description of Radar in Dutch.
C.B.4337	Notes for O/C R.N.Shore Stations. Siting and Calibration of H/F and V.H/F-D/F Equipment.
C.B.4218(42)	Type 251M.
C.B.4229	Type 253 (English Manufacture).
C.B.4230	Types 243/M
C.B.4230(1)	Addendum to C.B.4230 for Type 243Q
C.B.4291(45)	Type 242.
C.B.4026(44)	Outfits VC/VF
C.B.04222	R. G. Apparatus.
C.B.04222(A)	Addendum to C.B.04222
C.B.04315	Type 304M
C.B.4381	Type 341

LIST OF CURRENT A.S.E. PUBLICATIONS ISSUED AS R.H. BOOKS. (CONTD).

<u>Book No.</u>	<u>Subject Matter.</u>
RH.527	Handbook for Type 277S.
RH.544A/B/C	Preliminary Instructions for Modulator 2C Patt.53421. (Speech Control Outfit).
RH.565	Operating Instructions for Type 651.
RH.566	Handbook for R.E.A.
RH.600(1)(2)(3) (4)(5)(6)	A.S.E. Bulletin.
RH.602	Handbook for Receiver P60.
RH.603	Mechanical Drawings for AE Outfit AUK.
RH.606	Handbook for Type 253P
RH.609	Handbook for Outfit QN.
RH.614	Preliminary Handbook for Type 951
RH.616	Prelim.Handbook for Type 244 Indicator Unit.
RH.620	Handbook for Test Set Design 8 for use with Type 951
RH.631	Handbook for Type 941
RH.633	Prelim.Handbook for Type 952.
RH.638(1)(2) (3)(4)	Handbook for Knobbly Ships (Radar). To be issued shortly.
RH.640	Prelim.Handbook for Receiver P58.
RH.649	Prelim.Handbook for Ranging Outfits RTB and RTE (Panel L37).
RH.654	Preliminary Notes on Type 971
RH.654A	Prelim.Operating Notes on Type 971
RH.657	Type 651 Monitoring Equipment (Receiver P101).
RH.658	Handbook for D/F Outfit FH4 (New Edition).
RH.679	Preliminary Handbook for Indicator JH1, JH2 and JH1. (Panel L43).
RH.669	Handbook for Ranging Outfits

C.B.4226 Type 91
 C.B.4281 Type 78T
 C.B.4316 Types 64M/MT/PT
 C.B.4287 Type 92
 C.B.04261 Outfit QH
 C.B.4329 Outfit QG
 C.B.4384 (1)(2)(3) Types 282/3/4/5. Will be issued shortly.
 C.B.4223(1) Types 279
 C.B.4231(A)(B) Types 271Q/3Q
 C.B.4232(A)(B) Types 291
 C.B.4310(A)(B) Types 281/281B
 C.B.4347(1)(2) Type 286P
 C.B.4325 Type 257/S
 C.B.4350 Test Set S.E.2
 C.B.4356 Wavemeter G82A
 C.B.4393 Performance Meters Des.2 and 4. To be issued shortly.
 C.B.4360 Outfits KFD/E
 C.B.4358 Rotets
 C.B.4298(44) Indicator Outfit JE
 C.B.4322 Teacher Outfit HRA
 C.B.4355(1)(2) Teacher Outfit HRB
 C.B.3124 Type 268
 C.B.4324(1)(2)(3) Test Outfit TOA/B/C/D/E
 C.B.4382(1)(2) Type 970

RH.687(1)(2)(3) Type 267 MW/FW
 RH.689 Handbook for Knobbly Ships (W/T) To be issued shortly.
 RH.698 Handbook for D/F Outfit FV7.
 RH.716 Preliminary Handbook for Types 277P and 293P.
 RH.720 Handbook for Type 654 (American RC156).
 RH.735 Handbook for Van 36 (Mobile Type 277MS).
 RH.712 Handbook for Van 34.

LIST OF CURRENT A.S.E. PUBLICATIONS ISSUED AS "H" BOOKS.

H.292 Notes on W/T Transmitter Type 22C
 H.309 " " D.C. Amplifier M31
 H.316 " " W/T Transmitter Type 21B
 H.326/A Preliminary Notes on Type 34M/P
 H.328 Notes on Type 72D/DM.
 H.333 " " Speed Control System for Type 72D/DM.
 H.337 " " Type 57D and C.W.S.Equip.
 H.341C Addendum C for Type 279 (Type 79M and 279M).
 H.361 Preliminary Notes on Training Model for Type 72D/DM Sets.
 H.371 Preliminary Notes on D/F Outfit FM4
 H.372 " " " " " " FM7
 H.374A Handbook for Types 271X/271 and Notes on 271P.

LIST OF CURRENT A.S.E. PUBLICATIONS ISSUED AS R.H. BOOKS

RH.84 Book of Instructions for Wavemetering and of Wavemonitoring Types 72D/DM.
 RH.449 Pts.1 - 6. Preliminary Notes on Type 274.
 RH.460 Pts.1,2,3. Preliminary Handbook for Type 275
 RH.510/A Preliminary Handbook on D/F Outfit FV5.
 RH.518 Preliminary Handbook for Type 267W.
 RH.520/A/B Preliminary Notes on Type 255.

H.374B Notes on Panel 121 Receiving (Type 271M/272M/273PR).
 H.379 Preliminary Notes on D/F Outfit LM2
 H.382 Preliminary Notes on Operation and Adjustment of Outfits RHT and RHR4.
 H.387 Preliminary Notes on Type 66.
 H.394 Handbook for Voltage Control Board Design "A", Patt. 1215.
 H.395 Book of Instructions D/L Direction Finder.

Book No.	Subject Matter.
H.396	Notes on Erecting Masts for Type 63 (Beacon Equipment).
H.397	Notes on Naval Mobile Radio Beacon Type 63.
H.398 (2 pts.)	Preliminary Handbook on Type 252
H.398A	Addendum No.1 to H.398, Showing Mod. on Conversion to 252P.
H.401	Handbook for Outfit REB (2).
H.402	Notes on the Suppression of Interference to Reception on W/T Signals.
H.403	Preliminary Notes on Fitting of RIS(2)
H.405	" " " Panel L17.
H.407	" " " Transmitter 5FR.
H.416	Instructions for Conversion of Boards, Voltage Control (Valve) Design "B"
H.421	Handbook for Type 86
H.425	Handbook for Type 241
H.427	Handbook for Lantern Signalling 10kW Patt.W3857.
H.464/A	Preliminary Notes on Indicator Outfit JK (Skiatron).
H.469	Book of Instructions for Receiver P.29
H.475	Instructions for guidance of officers responsible for W/T lay-out at new naval aerodromes.
H.476	Notes on addition of Frequency Multiplier to Transmitter 4T.
H.479	Book of Instructions for Outfit REC.
H.480	Preliminary Notes on Type 253MW.
H.489	Book of Instructions for Outfit QV4
H.525/A	Handbook for Type 277A/277T (old Types 273SA/ Mk.5 277SX Mk.5).
H.546/A/B	Preliminary Notes on Type 276,277 & 293
H.549	Preliminary Notes on Type ZB2/ARA, Aircraft Installation used with Type YE1
H.550	Notes on Maintenance Type YE Equipment
H.551	Preliminary Notes on Aerial Outfit AUK
H.552	Instructions for Instrumental Test H/F D/F Outfit FH3.
H.563	Type 653 (Naval Carpet 2).
H.564	Operating Instructions for Type 650.

LIST OF CURRENT A.S.E. PUBLICATIONS ISSUED AS S.S.

BOOKS.

S.S.37	Book of Instructions for Oscillator G31
S.S.43	" " " " Tuner Amp.B13
S.S.49	B.O.I. for Wavemeter G56 and Osc. G33.
S.S.50	B.O.I. for Type 53 Portable W/T Set.
S.S.53	Book of Instructions for Type 26B.
S.S.57	" " " " Type 52ERT
S.S.61	" " " " Type 36M
S.S.62	" " " " Board Aerial
S.S.67	Exchange EA to EF and Associated Equip.
S.S.69	Book of Instructions for Type 25B.
S.S.70	B.O.I. for Types 52FH/FHV/CFH.
S.S.71	B.O.I. for Tuner Amplifier B19.
S.S.71	B.O.I. for Sound Reproduction Equip.
S.S.72	B.O.I. for Tuner Amp.B50 (Receiver Outfit CAD).
S.S.73	Book of Instructions for Wavemeter G61
S.S.74	" " " " Wavemeter G62
S.S.75	B.O.I. for Central Control System (C.C.S)
S.S.76	Book of Instructions for Type 405
S.S.77	" " " " Type 49M/MR
S.S.78	" " " " Oscillator G35
S.S.79	" " " " Tuner A50 -
S.S.81	Amplifier M50 (Receiver Outfit CAA).
S.S.82	B.O.I. for Morse Transcribing Unit.
S.S.85	Book of Instructions for Type 59D.
S.S.85	" " " " Type 55/V
S.S.88	B.O.I. for Type 60E/EM/ER/EMR.
S.S.89	B.O.I. for Transmitter Outfit 4TA.
S.S.90	B.O.I. for Receiver B28.
S.S.90A	Receiver B28 - Notes on I/F Circuit Alignment.
S.S.92	B.O.I. for A.C. Supply Outfits DE-DRC
S.S.93	Book of Instructions for Type 37P/PR
S.S.94	" " " " Type 67
S.S.95	" " " " Type 60D
S.S.102	" " " " Type 50M/MR
S.S.103	Handbook for Wa/T Set Type 407
S.S.104	Book of Instructions for Receiver B29.

S.S.106A	B.O.I. for D/F Outfits FM11/FM12.
S.S.110	Handbook for Transmitter T.1190 (Type 88)
S.S.116	Book of Instr. for Tuner Amp.B23 & B23A.
S.S.117	Book of Instructions for Outfit R.I.S.(1)
S.S.121	" " " " Type 89M
S.S.123	" " " " A.C. Supply
S.S.124	Outfits DDC and DDD.
S.S.124	Handbook for Type 406M
S.S.125	Book of Instructions for Receiver B34.
S.S.126	" " " " Oscillator G44
S.S.129	B.O.I. for TW12A-F, S1/S2/S3 with H/F Attachment and Crystal Control.
S.S.133	Book of Instructions for Type 249.
S.S.134	" " " " Isenthal Reg.
S.S.135	B.O.I. for Wavemeter G73 and Osc. G42.
S.S.136	Operating Instructions for D/F Outfit FV4.
S.S.137	Book of Instructions for Patt. 443. Lantern Signalling, 3kW.
S.S.138	Operating Instructions for FH4 with plug in coils.
S.S.142	Handbook for Transmitter 5F
S.S.143	Handbook for V.H/F Communication.
S.S.144	" " " Outfit R.I.S. (3).
S.S.145	B.O.I. for Tuner Amp.B35 and D/F Attachment.
S.S.146	B.O.I. for Oscillator G205
S.S.147	Book of Instructions for Type 682 and Receiver Outfit CDK.
S.S.148	Book of Instructions for Outfit REB(3)
S.S.150	" " " " Receiver P33.
S.S.152	Handbook for Morse Instructional Unit and Associated Apparatus.
S.S.160	Book of Instructions for Type 65.
S.S.161	B.O.I. for Rect.Unit S.E.8 (Type 86M).
S.S.162	Book of Instruc. for Outfit R.I.S.5.
S.S.164	Handbook on Frequency Control Panel for Type 57D.
S.S.165	Book of Instructions for Type 86M
S.S.166	B.O.I. for Receivers P38 or P48.
S.S.167	B.O.I. for Type 87M (Transmitter 8C).
S.S.168	Handbook on Osc.G41 and Sig.Inversion Unit
S.S.169	Operating Instr. for Trans.8C (Type 87M)
S.S.170	Handbook for Transmitter Type G.12T
S.S.171	Supplement for Handbook for Transmitter Type 4336 - B.
S.S.172	Book of Instr. for Type 408 Wa/T Set.
S.S.173	Handbook for Type 431 (Modified) and Loudspeaker Unit Patt. 45846.
S.S.175	Book of Instructions for Type 686.
S.S.176	Book of Instructions for Use of Oscillator G41 with Signal Inversion Unit.
S.S.177	Handbook for Type 607 and 608.
S.S.178	Handbook for Oscillators G208/G209/G210.
S.S.179	Book of Instructions for Type 610.
S.S.181	Instructions for fitting conversion kit to Outfit JE.
S.S.182	Book of Instructions for Type 89P.
S.S.183	" " " " Outfit QD
S.S.184	Handbook for Power Supply Outfits DUA and DUB.
S.S.186	Preliminary Handbook for Type 72DP
S.S.187	Book of Instructions for Transmitter T1083. Receiver R1082.
S.S.188	Standard Telephone Company TXNS. CS3/5 and CM8 C & M of Ceramic Water Tubes, Maintenance Instructions.
S.S.190	Handbook for Outfit KFC(X).
S.S.191	Preliminary Notes on W/T Sets, Types 57CM/CMR, 57DM/DMR.
S.S.191A	Preliminary Notes on W/T Sets Types 57CM/CMR, 57DM/DMR, Addendum No. 1.
S.S.192	Preliminary Notes on D/F Outfit FM2.
S.S.193	Book of Instructions for Type 686M.
S.S.194	B.O.I. for Outfit R.I.S.(4).
S.S.195	Book of Instructions for Power Supply Outfits DVB/C/D/E.
S.S.204	Handbook for Supply Outfits DWB/E.
S.S.208	Operating Instructions for Type 611.