

W/T MODERNISATION

A number of ships are expected to be taken in hand for modernisation in the next few months, and this will include a big programme for modernisation of W/T arrangements and equipment.

Assuming time, labour and equipment are available, points for consideration by A.S.E. and D.R.E., prior to the arrival of the ships concerned, are listed below :-

ARRANGEMENT OF OFFICES.

(A) Non C.W.S. Ships.

The standard arrangement of offices (C.A.F.O. 2383/43) is not feasible in several classes of cruisers, due to top weight and accommodation considerations. In these cases (e.g. County, Fiji and Dido Classes) arrangements are being made for a combined U.T.R. and L.R.R. (and S.D.O. as well in some cases where space in the bridge structure is inadequate), aft near the mainmast as high up in ship as can be arranged (old main W/T office/C.C.O.)

In these cases, where an L.T.R. aft is not forthcoming, the majority of transmitters will be in the U.T.R. so that only under abnormal conditions, or in the case of damage aft, should it be necessary to use the Transmitters in the L.T.R. whose aerials will be on the foremast ("Quiet" mast).

(B) C.W.S. Ships.

The immense amount of wiring work involved in altering office arrangements in these ships prohibits any large re-arrangement - Existing Transmitter Rooms and C.C.O. will remain.

(C) All Ships.

Additional space in the bridge structure is required for :-

- (i) a B.R.R. (See para. 2 (ii) of C.A.F.O. 2383/43),
- (ii) a V.H/F R/T Office to accommodate Types 87M/2,
- (iii) a 'Y' Office to accommodate 2 all wave bays (i.e. CDC/2, QD/2, QN/2, QP/2 and recording apparatus and frequency measuring equipment).

Space is also required for anti-Radar (i.e. Types 91 or TDY or CXFR) and anti missile (Type 650/1) R.C.M. transmitters. They will be situated in the U.T.R. where space and aerial feeder lengths permit.

TRANSMITTING EQUIPMENT.

Old sets like Types 48, 49 and 36 will be removed and replaced by American equipment (TAJ, TBK, TBM, TCK) pending the production of the 600 series. A total of 5 low power transmitters will also be provided. In C.W.S. ships these will be Type 60 EQR in the B.R.R. and Types 60DR/2 in each Transmitter Room; in non C.W.S. ships Type/s 60 EQR and FR/2 in U.T.R., 60 FR in L.T.R. and 60 EQR in B.R.R.

RECEIVING AND D/F EQUIPMENT AND NAVIGATIONAL AIDS.

Modern receivers of the B28, B29, AR88 type will replace existing equipment. In certain cases, outfits C&B will be retained in L.R.R.'s and T.R.'s. H/F D/F FM12 will be fitted in the B.R.R., and, in all ships where space and top weight permits, H/F D/F RH2 will also be fitted aft. Navigational Aid equipment DAS (Loran) will be fitted in the Chart House.

CONTROL CIRCUITS.

Modern requirements, particularly those arising from the increased use of R/T from numerous positions and the introduction of the A.I.O. Scheme, have complicated remote control arrangements considerably. Diagrams showing the "Interim Arrangements" which will be incorporated in "Modernisations" are on pages 61 and 62. A new Control system is being devised for new construction ships and will be known as Control Outfit KCH. C.C.S. and other non C.W.S. ships will be fitted with the "C.C.X. - non C.W.S." which will be in the L.R.R.

The "C.C.X. - C.W.S." will remain in C.W.S. ships.

FIGHTER DIRECTION EQUIPMENT.

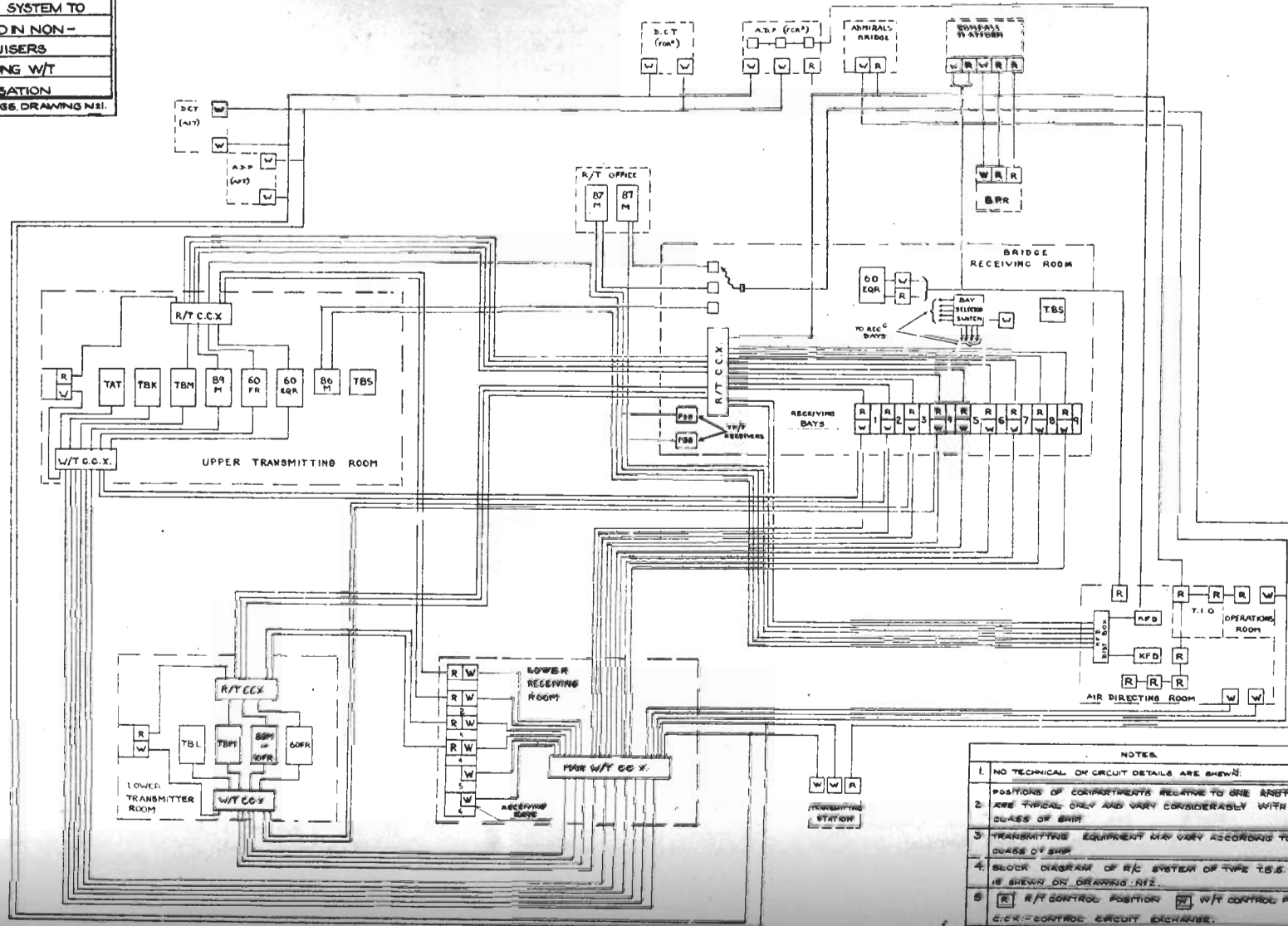
Aircraft Direction Control Outfit KFD (C.A.F.O. 441/44) and speech control outfit KGL (C.A.F.O. 1126/44) will be fitted. It is intended to fit Type 87M/2 forward in the R/T office and Types 86M, 89M/P or equivalent (TBM, TCK, or TBL with R/T) aft in the U.T.R.

MISCELLANEOUS.

- (a) It is now the policy to fit two Types TBS - one forward in the B.R.R. (or R/T office if there is not enough room in the B.R.R.) and the other in the U.T.R. A C.A.F.O. is being prepared. The exact employment of these two sets is not yet determined.
- (b) Receiving aerial Exchange outfit EJ (C.A.F.O. 1183/44) will be fitted.

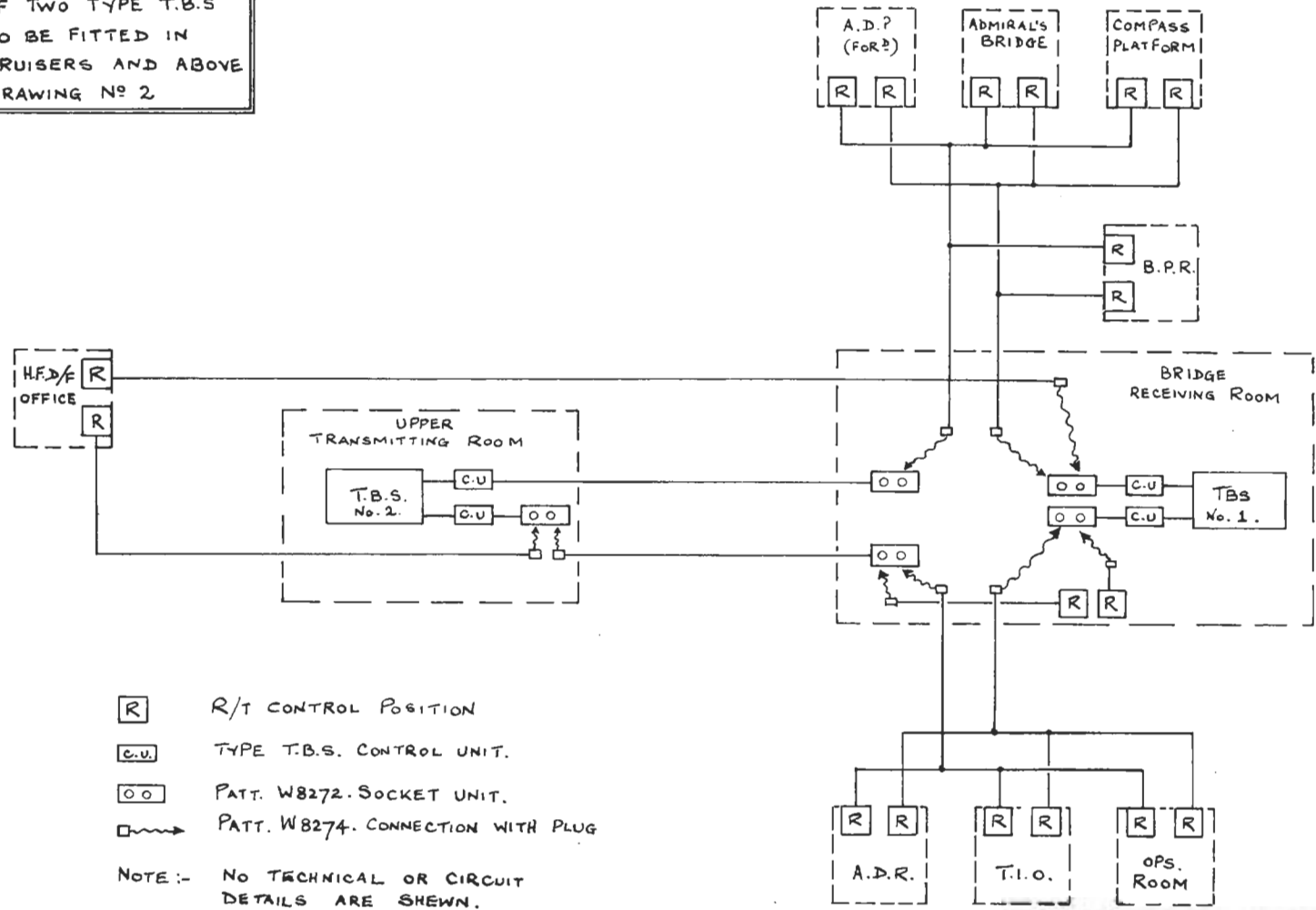
BLOCK DIAGRAM OF
TYPICAL W/T AND R/T
CONTROL SYSTEM TO
BE FITTED IN NON-
C.W.S. CRUISERS
UNDERGOING W/T
MODERNISATION

TWO DRAWINGS, DRAWING N21.



- NOTES
1. NO TECHNICAL OR CIRCUIT DETAILS ARE SHOWN.
 2. POSITIONS OF COMPARTMENTS RELATIVE TO ONE ANOTHER ARE TYPICAL ONLY AND VARY CONSIDERABLY WITH CLASS OF SHIP.
 3. TRANSMITTING EQUIPMENT MAY VARY ACCORDING TO CLASS OF SHIP.
 4. BLOCK DIAGRAM OF R/C SYSTEM OF TYPE T.B.S. IS SHOWN ON DRAWING N22.
 5. R R/T CONTROL POSITION M W/T CONTROL POSITION
E.C.X. - CONTROL CIRCUIT EXCHANGE.

BLOCK DIAGRAM OF
R/T CONTROL SYSTEM
OF TWO TYPE T.B.S
TO BE FITTED IN
CRUISERS AND ABOVE
DRAWING No 2



- R R/T CONTROL POSITION
- C.U. TYPE T.B.S. CONTROL UNIT.
- OO PATT. W8272. SOCKET UNIT.
- PATT. W8274. CONNECTION WITH PLUG

NOTE:- NO TECHNICAL OR CIRCUIT
DETAILS ARE SHOWN.

W/T TEST EQUIPMENT SHIPS AND BASES

It is now possible to give details of the W/T test equipment for ships and bases, introduction of which was forecast in the March issue of the Bulletin.

2. To meet the increased complexity of modern W/T apparatus, four additional Test Equipment Outfits have been introduced, viz. TOK, TOL, TOM, TON.

These Outfits are to be issued as follows :-

OUTFIT 1 (TOK) to :-

Fleet W/T Maintenance parties and Training Establishments.

OUTFIT 2 (TOL) to :-

Bases.

Category A1. A very large port where major refits and repairs in addition to maintenance work are carried out on operational craft based on that port, e.g. Glasgow.

Category A2. A large port where major refits and repairs in addition to maintenance work are carried out on operational craft based on that port, e.g. Liverpool.

Category A3. A large port where refits and repairs in addition to maintenance work are carried out on operational craft based on that port, e.g. Belfast.

Category B1. A very large port where building and major refits only are carried out, e.g. Newcastle.

Category B2. A large port where building and major refits only are carried out, e.g. Chatham.

Category C. A large port where mainly maintenance is carried out, e.g. Londonderry or Scapa.

Category D1. A port subsidiary to a main port where refits and repairs are carried out and/or maintenance work on operational craft.

OUTFIT 3 (TOM) to :-

Flotilla leaders and above, and bases Category D2 - a minor port subsidiary to a main port where a small amount of maintenance is carried out.

OUTFIT 4 (TON) to :-

Destroyers, sloops, frigates, corvettes, submarines, fleet minesweepers.

Note : Certain items will not be issued to submarines.

The contents of the various outfits are given in Appendix I. These outfits are general outfits and additional Test Equipment which may be necessary to service specific apparatus will be added from time to time as found necessary.

It will be noted that certain items which are expensive or in particularly short supply, are to be shared between W/T and Radar staffs, the chief user normally being responsible for it.

A note of warning must be sounded here, Test Equipment is precision apparatus, and as such, takes a considerable time to manufacture. It will, therefore, be some time before the equipment detailed can be made available for issue. When you do get it, treat it gently, as replacements, if obtainable at all, will be at the expense of someone else's initial issue.

It is proposed that the maintenance and faulting sections of handbooks will in future be drafted around this test equipment and that sets of standard readings will be included to simplify fault finding and removing.

(b)	(c)	(d)	(e)	(f)	(g)
General Test.	E.S. Voltmeter	A.P.7810	2 - 6 kv., 8" dial.	1 - - -	
General Test.	Ind. & Cap. Measurement.	Mullard A.P.W5000		- - 1 -	Common with Radar. W/T chief user.
General Test.	Ind. Cap. and Res. Measurement.	M.I. Universal Impednc. Bridge. TF.373 A.P.54709	0 - 100H in 5 ranges (lwst.calbn.5 μ H) 0 - 100 μ F " " " (" " 5 pF) 0 - 100 Q (" " 0.1) 0 - 1 power factor (" " 0.001) All at 1000 cps. 0 - 1 megohm in 5 ranges (lwst.calbn.0.05 ohm) D.C. measurement.	1 1 - -	
General Test.	Q Meter	M.I.TF.329 with 18 coils TM.1438A-R	10 - 500 Q. 50 - 490 pF 50 kc/s - 50 mc/s.	1 - - -	
Receiver Test.	Valve Voltmeter	M.I.TF.428	0.1 - 150v. in 5 ranges 1% error 20 cps-50 mc/s 3% error at 100 mc/s.	1 1 - -	
Receiver Test.	Valve Voltmeter	Muirhead (1B)	Portable battery model.	1 1 - -	
Transmitter Test.	Valve Voltmeter	To be developed	0 - 500v.	1 1 -	

(a)	(b)	(c)	(d)	(e)	(f)	(g)
13	Receiver Test	Oscilloscope	G.E.C. miniature A.P.53259		1 1 1 * -	* Only when R.I.S. is fitted.
14	Receiver Test	Oscilloscope	Cossor D.B. A.P.W3336A		2 1 1 * -	* Common with Radar. Radar Chief user.
15	Receiver Test	Output meter	Under design		1 1 1 1	
16	Receiver Test	Output meter	M.I.T.F.340/2	0.1mW - 5W. Impedance range 2.5 - 20,000 ohms. Power range extended to 10W at 100, 600 and 5,000 ohms.	1 1 - -	
17	Transmitter Test	Performance meter (simple F/S meter)	Under design		1 1 1 -	
18	Transmitter Test	Simple Crystal Detector	Under design		1 1 1 1	
19	Transmitter Test	F/S Meter and Noise Meter	Ferris Model 32A or substitute	1 - 100,000mV. 160 - 320 kc/s 600 kc/s - 20 mc/s	1 1 - -	
20	Receiver Test	Signal Generator	Outfit GN G73 A.P.W2508 G42 A.P.W3986	100 kc/s - 25 mc/s (Shore stations to 19 kc/s.)	1 1 1 * 1 *	* Common with Radar W/T chief user.
21	Receiver Test	Signal Generator	A.P.W6796 (A.P.W4999)	10 - 150 mc/s (4 - 12, 16 - 100 mc/s)	1 1 1 * 1 *	* Common with Radar. W/T chief user. (W4999 to be supplied until W6796 ready). Only required in Outfit 4 in ships fitted with receivers above 25 mc/s.

(a)	(b)	(c)	(d)	(e)	(f)				(g)
	Receiver Test	Signal Generator (Standard)	A.P.54704 (TF.144)	85 kc/s - 25 mc/s in 8 ranges 1 μ V - 1.0v.	1	1	-	-	
	Receiver Test	Signal Generator (Standard)	A.P.54705 (TF.390)	18 - 150 mc/s (Alternative ranges available to 5 mc/s.) 0.1 μ V. - 0.1v. Output Impedance 30 ohms (0.1 μ V. to 10mV) 10 ohms (1 μ V. - 100mV.) Modulation 400 cps internal or external.	1	1	-	-	
	Receiver Test	B.F.O.	M.I.TF.195	10 cps. - 20 kc/s.) 2W.max.output 50cps. 20 kc/s - 40 kc/s.) - 15 kc/s. 600 and 2,500 ohms impedance.	1	1	-	-	
5	Receiver Test	Ganging Oscillator	Cossor 343 A.P.54707		1	-	-	-	
5	General Test	Wavemeter Outfit GK	(G41.A.P.4050 (G62.A.P.4685A (G35.A.P.4809A (A.P.1204B	1 mc/s quartz crystal oscillator 100 kc/s " " " Oscillator 15 kc/s - 25 mc/s Rectifier Unit Design "B"	1	1	-	-	
7	General Test	Wavemeter	G56.A.P.8834K	15 kc/s - 25 mc/s Absorption type	1	1	-	-	
8	General Test	Receiver	B28 or A.P.88		1	1	-	-	
9	General Test	Valve Tester	Avo model under consdn. as A.P.	All English, American and Continental types.	1	1	1	1	

(a)	(b)	(c)	(d)	(e)	(f)				(g)
30	General Test	Qu. Crystal Tester.	A.M. Test Set 193	2 - 20 mc/s.	1	1	1	-	
31	General Test	Qu. Crystal Tester.	A.M. Test Set 330.	90 kc/s - 2 mc/s.	1	-	-	-	
32	General Test.	Variac	2 kW. - A.P.W1360	Type 100K or 100L	2	2	-	-	
33	General Test	Variac	Type 200 CMH	580W. Load rating	6	2	-	-	
34	General Test	Loudspeakers	A.P.4480R		2	1	-	-	