

R N SHORE STATIONS

1. U.K. STATIONS

(a) Central Control

Whitchall W/T - Lenni's Tomb - Remote Controls.

(b) Transmitting Stations

- (i) Horsca - H F - F.S. - No expansion possible.
- (ii) Bodmin - H F - F.S. V.G. Site is shared with Cable and Wireless; used to back up Horsca.
- (iii) Cloethorpes - L F and M F. V.G. being expanded.
- (iv) Tetroy - Satellite for Cloethorpes.
- (v) Malvern - Emergency if Whitchall is Blitzed.
- (vi) Ledger facilities - R.A.F. Greatworth - if required.
G.P.O. Criggion - V.G. Rugby U L F - V.G.

- Note: 1. Broadly speaking, Horsca provides Fixed Service and "GM" Routine transmitters. Cloethorpes provides Home Station Broadcast transmitters.
2. There is a project for building a big replacement station for Horsca in Scotland.

(c) Receiving Stations

- (i) Flowerdown - H F F.S. - Poor site - expanding.
- (ii) Scarborough - H F F.S. - V.G.
- (iii) Burnham - shared with G.P.O. - Ship-shore - V.G.I.

Note: There is a project for building a big replacement station for Flowerdown at Forest Moor.

(d) Command Stations

- (i) Portsmouth - (Fort Southwick - C and M).
- (ii) Plymouth - (Transmitters at Fort Staddon).
- (iii) Portland.
- (iv) Scapa - (C and M).
- (v) Rosyth.
- (vi) Nore - (Dockyard and shared with R.A.F. - poor).

(e) Western Approaches

Originally at Preston - Now to be plan-packed.

2. OVERSEAS STATIONS(a) Malta

- (i) Transmitters - Rinella - 75% underground.
- (ii) Receivers - Zebbug (Fixed Services) and Lascaris (above and/or underground).
- (iii) Now station - Tarxien - transmitters - being built.

(b) Gibraltar

- (i) Transmitters - North Front.
- (ii) Receivers - Tunnel - underground.

(c) Fayid

Transmitters and Receivers - to a certain extent shared with the Army - but some of our own equipment is used.

(d) Ceylon

- (i) Ceylon West - transmitters and receivers - Colombo - Now.
- (ii) Ceylon North - Transmitters - Trincomalee - C and M.

(e) Capetown

- (i) TX. Cape South (Klavor) - Modern - V.G.
Cape East - Modern - V.G. (Union Territory).
- (ii) Rx. Union Territory - Modern - V.G.

(f) Singapore

- (i) Tx. - Swara.
- (ii) Rx. - Kranji.

Note: Possible L F Tx. in Johore and Rx. Station shared with Cable and Wireless at Maltida Estate.

(g) Hong Kong

- (i) Tx.- Stonecutters Island.
- (ii) Rx.- C in C's offices.

(h) Other Distant Stations

- | | |
|------------------------------------|--------------------------------------------------|
| (i) Falklands. | (vii) Freetown - No Rx's. |
| (ii) Bermuda - Cable and Wireless. | (viii) Corcuwai. |
| (iii) Adon - No receivers. | (ix) Mauritius. |
| (iv) Kilindini - No receivers. | (x) Seychelles. |
| (v) Persian Gulf. | (xi) Alexandria - leased to Egyptian Government. |
| (vi) Durban. | |

(i) Dominion Stations

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|----------------------------|----------------------------|
| (i) Halifax. | (iii) Bombay. |
| (ii) Belconnen (Canberra). | (iv) Waiorou (N. Zealand). |

1. D S 13

Makers Standard Telephones and Cables.

Frequency Range 4 - 27.5 mcs.

Power Output 22 Kw on CW, ICK or FSK, 40 Kw peak power on SSB.

Drive Units FSK and SSB drive units are fitted.

Power Input 70 Kw.

Remarks This transmitter has a water cooling system and it is considered undesirable that it should be used in tropical areas. Two RF drive 'trucks' are fitted which enables a second frequency to be preset to effect a relatively rapid change. In emergency the spare RF truck can be connected to the aerial with a power output of 5 Kw.

2. H S 51

Makers Marconi Wireless Telegraph Co.

Frequency Range 4 - 27.5 mcs.

Power Output 20 Kw on CW, ICK or FSK, 30 Kw on peak power with SSB.

Drive Units The basic transmitter does not incorporate special drive units. They can, however, be ordered as required and fitted without modifying the transmitter. The FSK drive unit is HD 12 and the SSB drive unit is either HD 51 or SSD 2. Air cooling is employed.

Power Inputs 60 Kw 3 phase, 380 - 420 volts.

Remarks None yet fitted for naval service. It is intended that they shall be used on the main long-distance multi channel fixed services, with SSB drive units where DS 13's have not been provided.

3. S W B 11 X

Makers Marconi Wireless Telegraph Co.

Frequency Range 2 - 27 mcs.

Drive Units HD 12 (FSK) and SSD 2 (SSB) can be fitted as required. SSB cannot be used below 4 mcs.

Power Output 4 - 7 Kw.

Power Input 19 Kw, 3 phase, 400 volts.

Remarks This and the 6X are the most modern of the SWB series. Production is ceasing on this series when current orders have been completed.

4. H S 41

Makers	Marconi Wireless Telegraph Co.
Frequency Range	4 - 27.5 mcs.
Power Output	8 - 10 Kw.
Drive Units	HD 12 (FSK) and HD 51 or SSD 2 (SSB) can be fitted as required.
Power Input	29 Kw, 3 phase, 380 - 420 volts.
Remarks	This transmitter will replace the SWB 11 series.

5. S W B 8 X

Makers	Marconi Wireless Telegraph Co.
Frequency Range	2 - 27 mcs.
Power Output	2 - 4 Kw.
Drive Units	HD 12 (FSK) and SSD 2 (SSB) can be fitted as required (SSB cannot be used below 4 mcs).
Power Input	9.5 Kw, 3 phase, 400 volts.

6. H S 31

Makers	Marconi Wireless Telegraph Co.
Frequency Range	4 - 27.5 mcs.
Power Output	2.5 Kw.
Drive Units	HD 12 (FSK) and HD 51 or SSD 2 (SSB) can be fitted as required.
Power Input	7.5 Kw, 3 phase, 380 - 420 volts.
Remarks	This transmitter will replace the SWB 8 series.

7. T F L 761 Series

Makers	Marconi Wireless Telegraph Co.
Frequency Range	40 - 150 kcs.
Power Output	40 Kw.
Power Input	76.5 Kw, 3 phase, 400 volts.
Remarks	For efficient operation, a horizontal 'Y' aerial array is required, supported by three 600 foot steel towers.

TRANSMITTERS8. Type 617 S

Air Ministry T 1509.
 Frequency Range 1.5 - 20 mcs.
 Power Output 300 watts.
 Power Input 1 Kw.
 Remarks Remote control unit type 310 is used. From 1.5 to 2 mcs, M O control only is available.

9. The following list shows the principle types of transmitters still in service in shore stations, for which no further orders will be placed. Some are obsolete, though many continue to give excellent service.

<u>TYPE</u>	<u>MAKERS</u>	<u>FREQUENCY</u>	<u>POWER OUTPUT</u>
CS 3B	S T & Co.	3 - 21.5 mcs.	5 Kw.
CS 5B	S T & Co.	12 - 30 mcs.	10 Kw.
SWB 11 W	Marconi	3 - 22 mcs.	6 - 7 Kw.
SWB 11 E	Marconi	3 - 22 mcs.	6 - 7 Kw.
SWB 8 E	Marconi	3 - 22 mcs.	2 - 3.5 Kw.
TFS 31	Marconi	3 - 22.5 mcs.	4 - 5 Kw.
R 20 A	S T & Co.	100 - 500 kcs.	5 Kw.
G 12 MR/T/U	Redifon	110 - 1200 kcs.	2 Kw.
CM 8 A	S T & Co.	60 - 500 Kcs.	10 Kw.
88 MRS	RAF T1190	1.5 - 15 mcs.	100 watts.

10. HANDBOOKS

Most handbooks have now been given BR numbers and those which have not, are issued under the name or number given by the makers. They may be obtained from DRE. Due to there being a number of editions of transmitters such as the SWB series, full details including the makers serial number of the transmitter must be given when demanding a handbook for a specific transmitter.

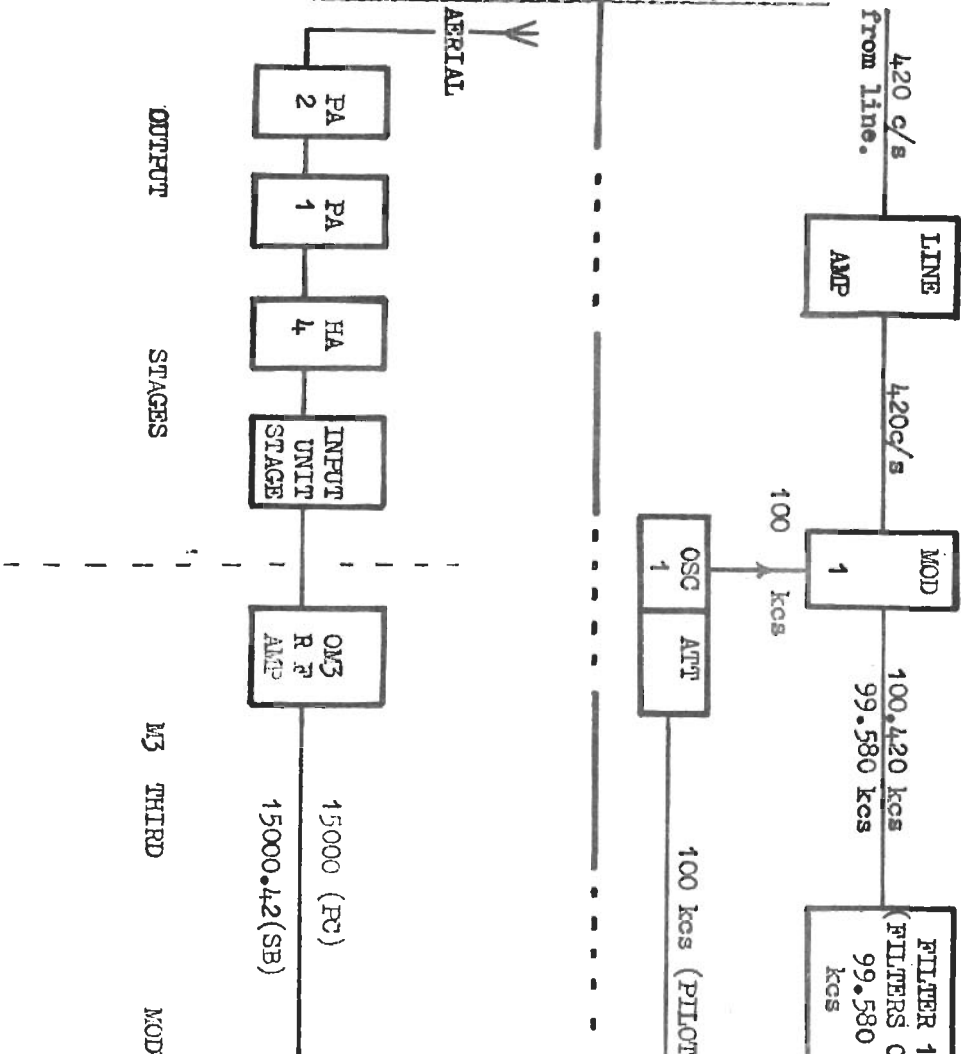
11. MODULATORS

If a modulator is required, the type of transmitter and makers serial number must accompany the demand.

12. BLOCK DIAGRAM OF SWB 11 E

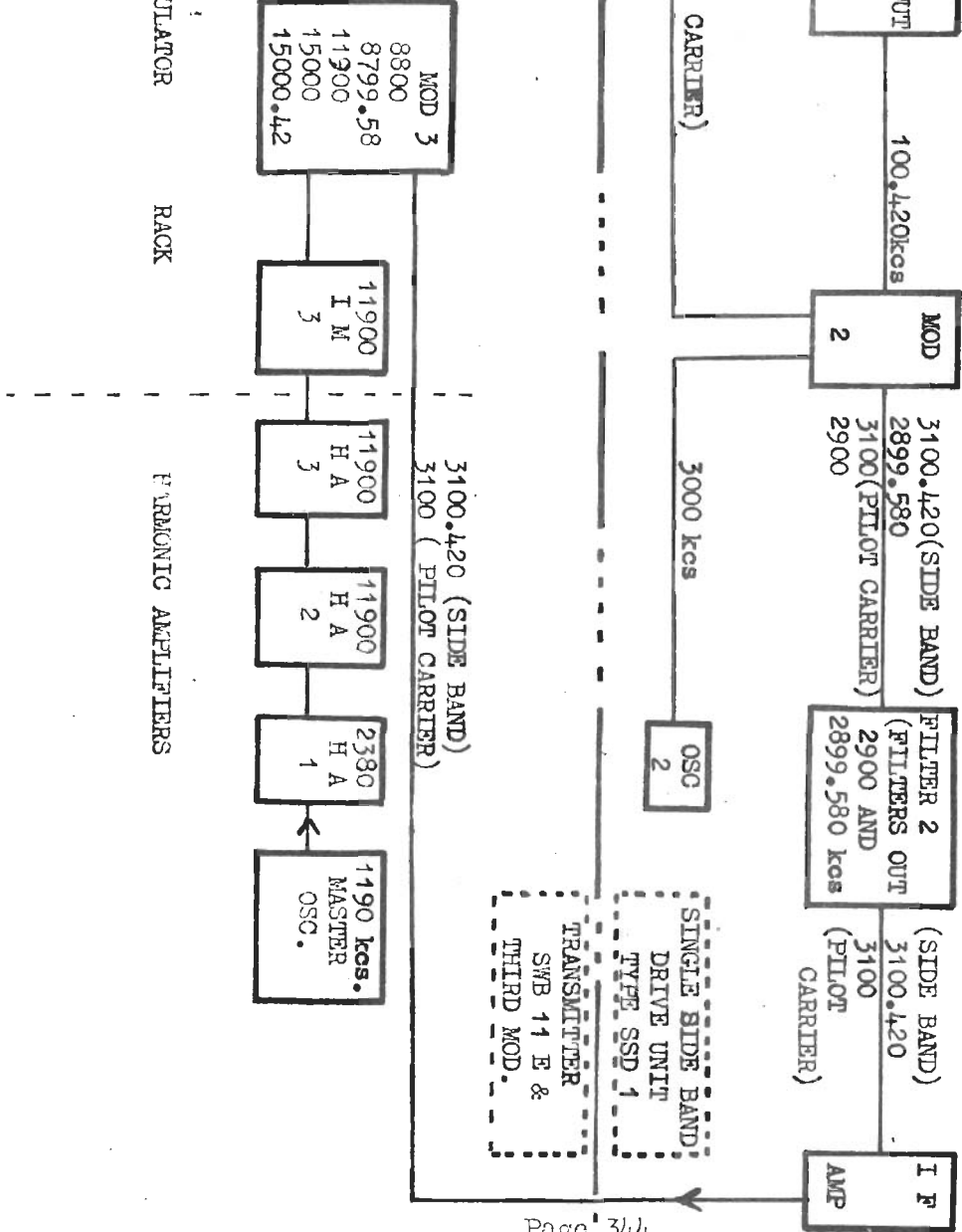
See plate on page 344.

SHORE STATIONS & THEIR EQUIPMENT



Showing typical frequencies involved

When radiating S.S.B. on 15 Mc/s.



RECEIVERS1. TRIPLE DIVERSITY (Normally space or frequency)

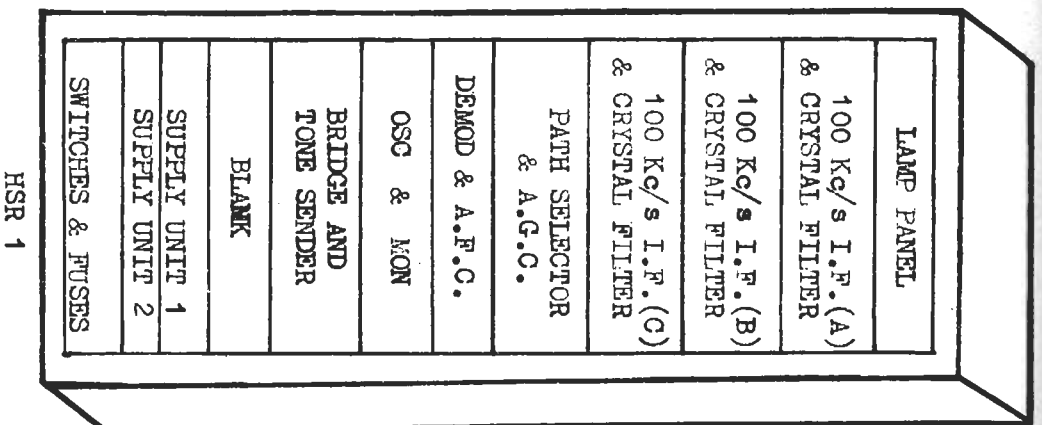
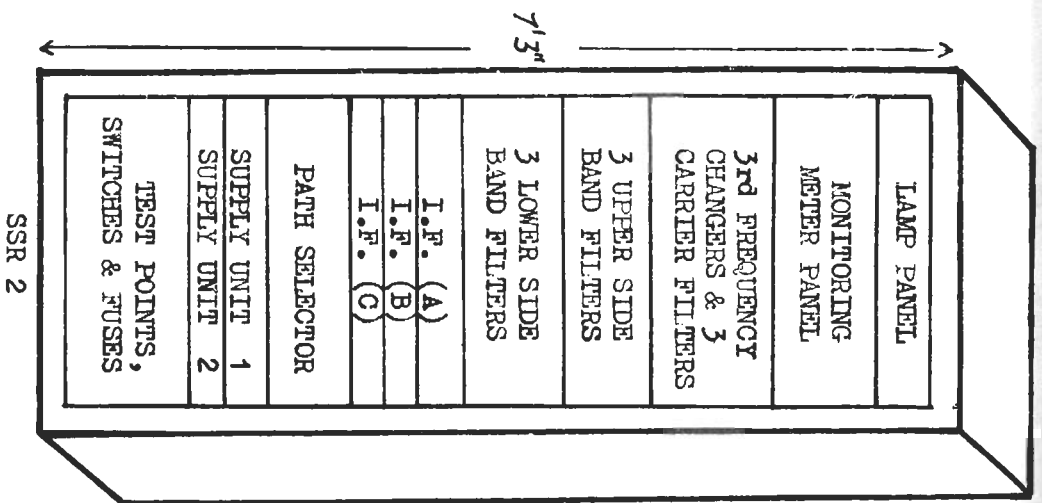
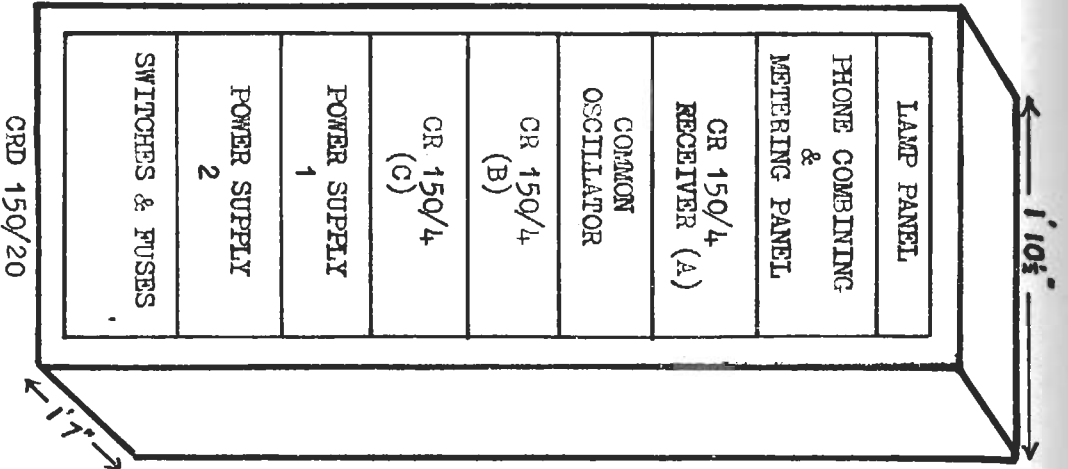
<u>OUTFIT</u>	<u>COMPONENTS</u>	<u>MAKER</u>	<u>FREQUENCY RANGE</u>	<u>REMARKS</u>
CDT	CRD 150	Marconi	60 kcs - 30 mcs	Obsolete
CGA	CRD 150/20	Marconi	1.5 - 30 mcs	Receiver rack only
CGB	CRD 150/20 and SSR 2	Marconi	1.5 - 30 mcs	For SSB
CGC	CRD 150/20 and HSR 1	Marconi	1.5 - 30 mcs	For ICK or FSK
CGD	CRD 150/20 and HSR1 and SSR2	Marconi	1.5 - 30 mcs	For ICK and FSK Note: About 30 minutes is needed to change to and from SSB
CGK	HR 13	Marconi	3 - 27.5 mcs	Replaces CGC
CGL	HR 23	Marconi	3 - 27.5 mcs	Replaces CGB

2. COMMUNICATION RECEIVERS

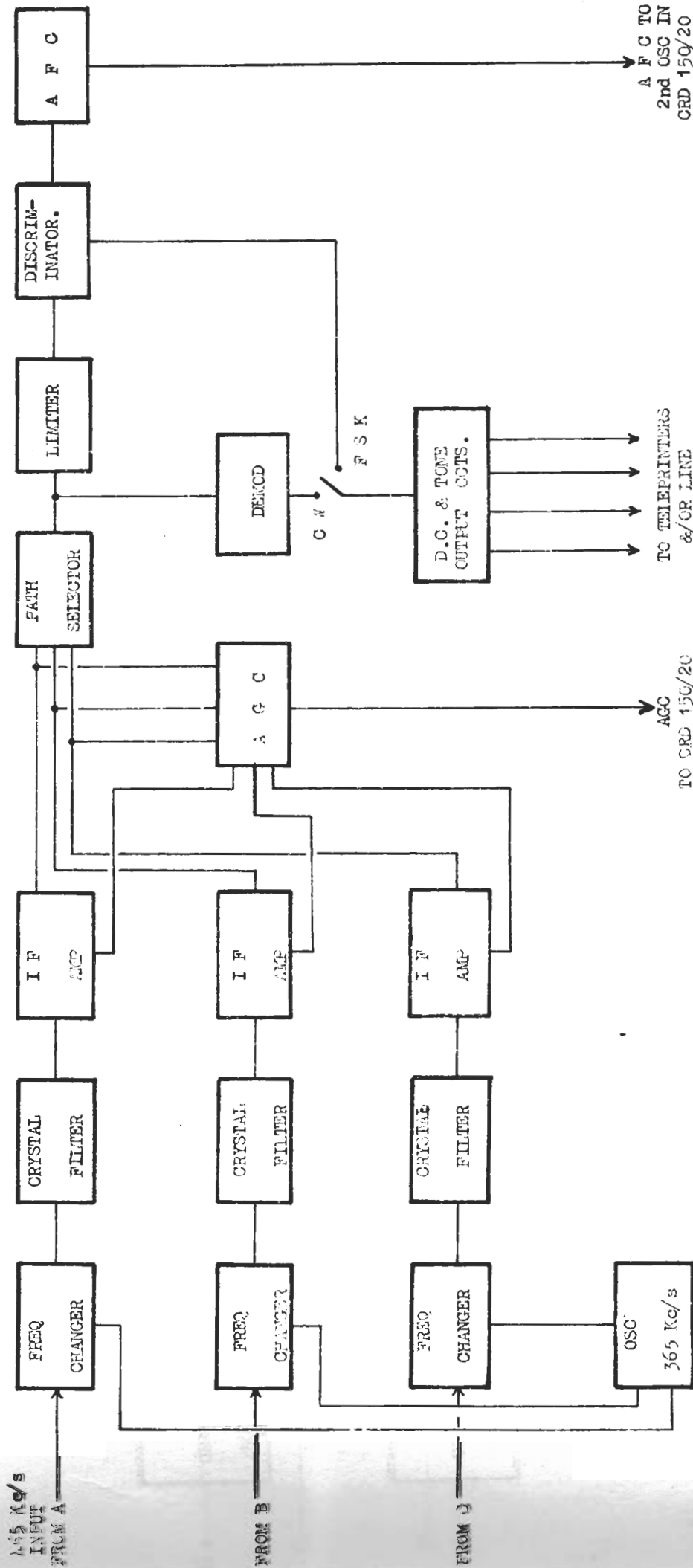
CDL	B 28	Marconi	60 kcs - 30 mcs
CDM	B 29	Marconi	15 kcs - 500 kcs
CDH	B 34	Eddystone	45 kcs - 31 mcs
CAQ	B 40	Admiralty	650 kcs - 30 mcs
CAR	B 41	Admiralty	15 kcs - 700 kcs

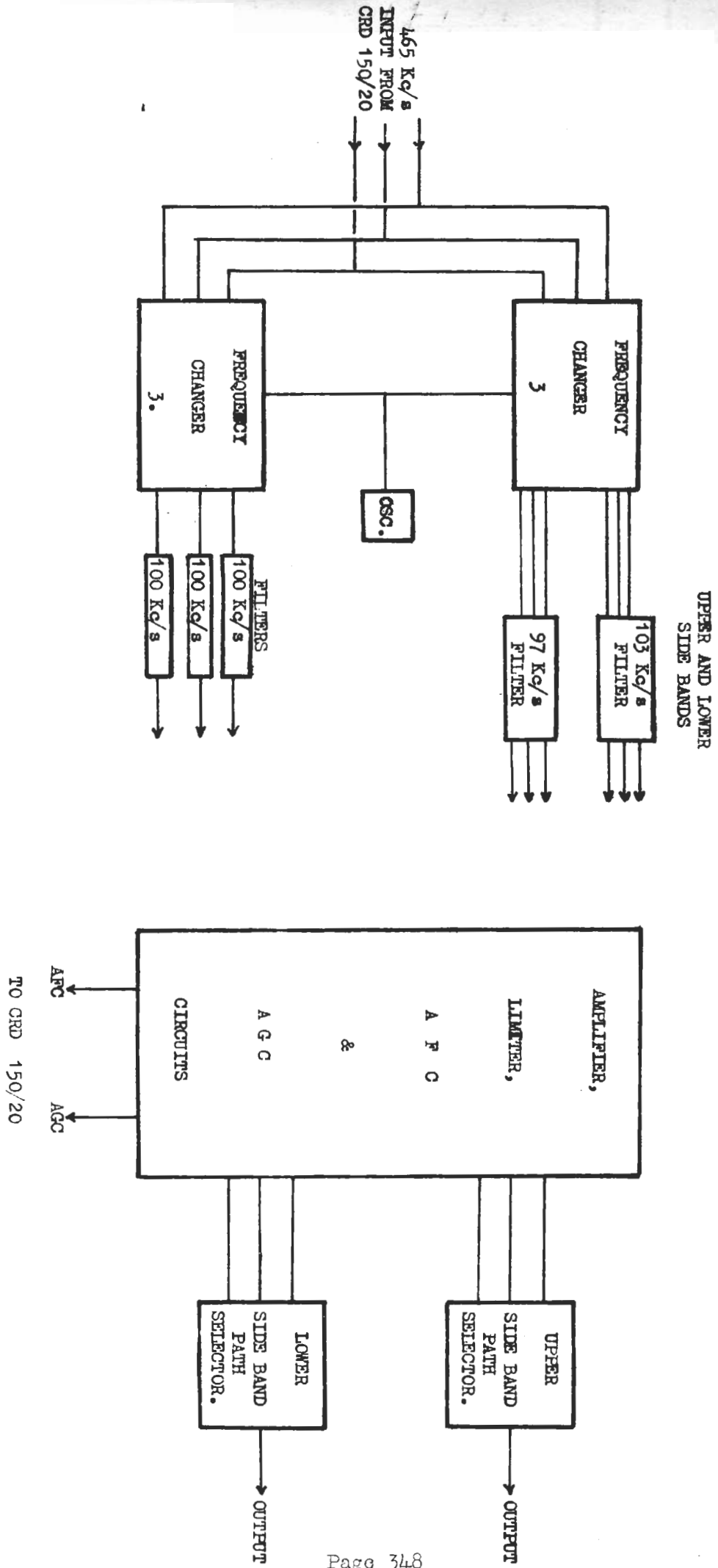
3. ADAPTORS

FAA	Adapter FSR	A.T & E	For FSK
FAB	Adapter FSX	A.T & E	For FSK
FAC	Dual Diversity AF to DC Converter	A.T & E	For dual diversity
---	RB 150	Marconi	Recording Bridge
---	HU 11	Marconi	For FSK & ICK It also replaces RB 150



USED WITH CRD 150/20 FOR I.C.K. OR F.S.K.





USED WITH CRD 150/20 FOR SSB.

6. S. S. R. 2.

1. A.S.R.E. DRAWINGS

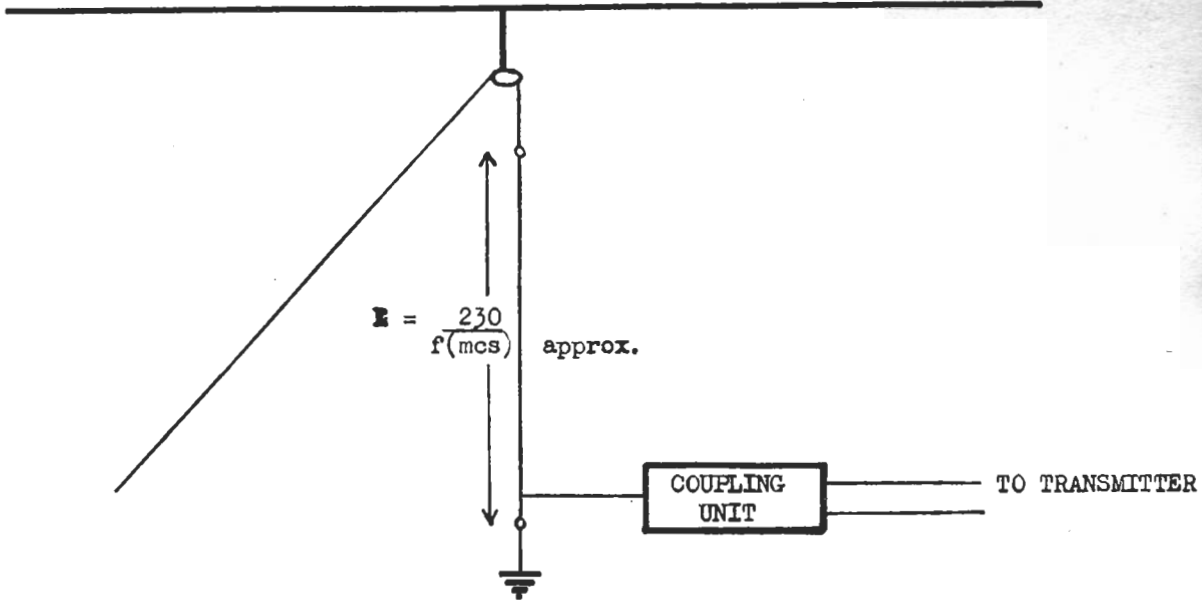
Detailed drawings of all arrays are prepared and issued by A.S.R.E. This establishment also prepares detailed plans of the layout of all aerials at shore stations in order to achieve maximum efficiency in the ground area available.

2. OMNI-DIRECTIONAL AERIALS

These are required for broadcasts, ship-shore services etc. H F aerials used may be:-

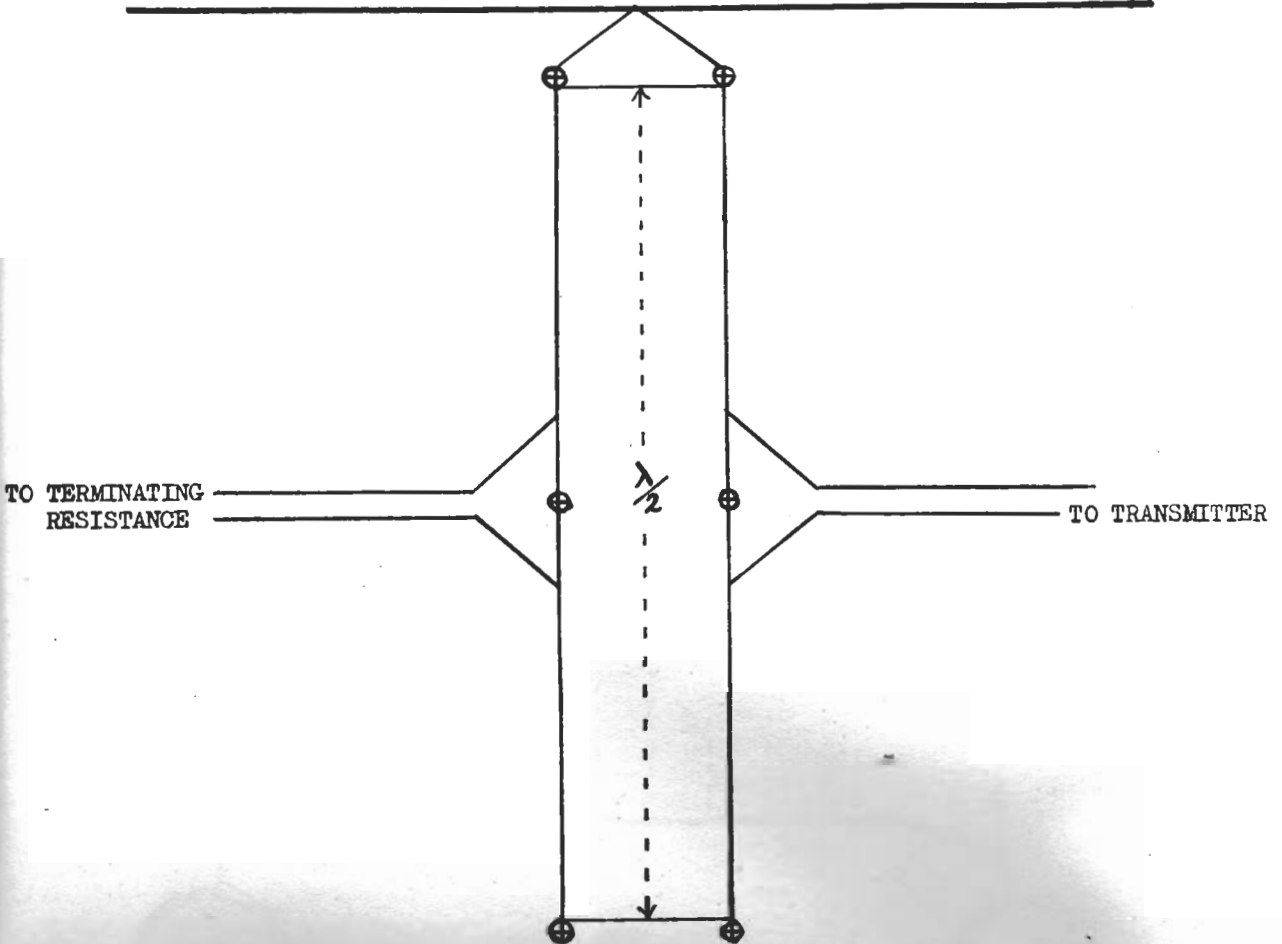
(a) Quarter Wave Vertical

TRIATIC STAY



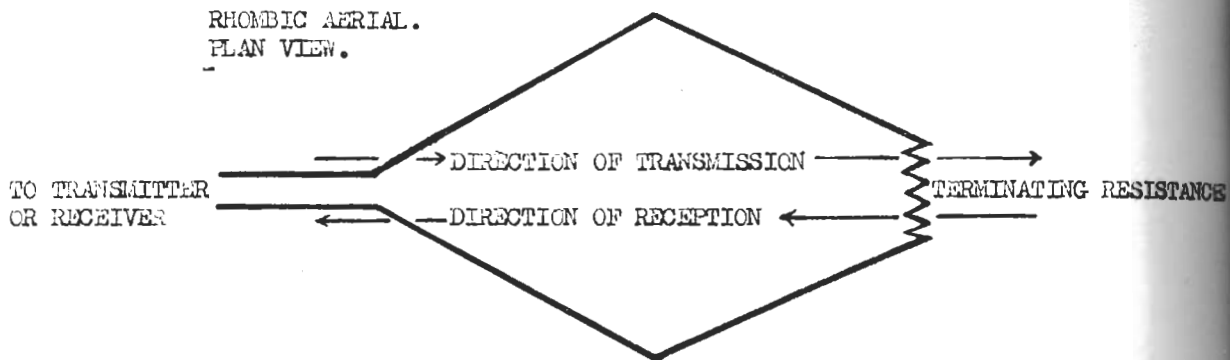
(b) Vertical Folded Terminated Dipole

TRIATIC STAY



3. FIXED SERVICE AERIALS

Directional aeriaks are used whenever possible. This is very necessary for A T circuits, where the best signal obtainable must be produced at the receiving station. Rhombics are used for transmitting aeriaks.

(a) Rhombic Aerial(b) Horizontal Array of Dipoles

See page 351

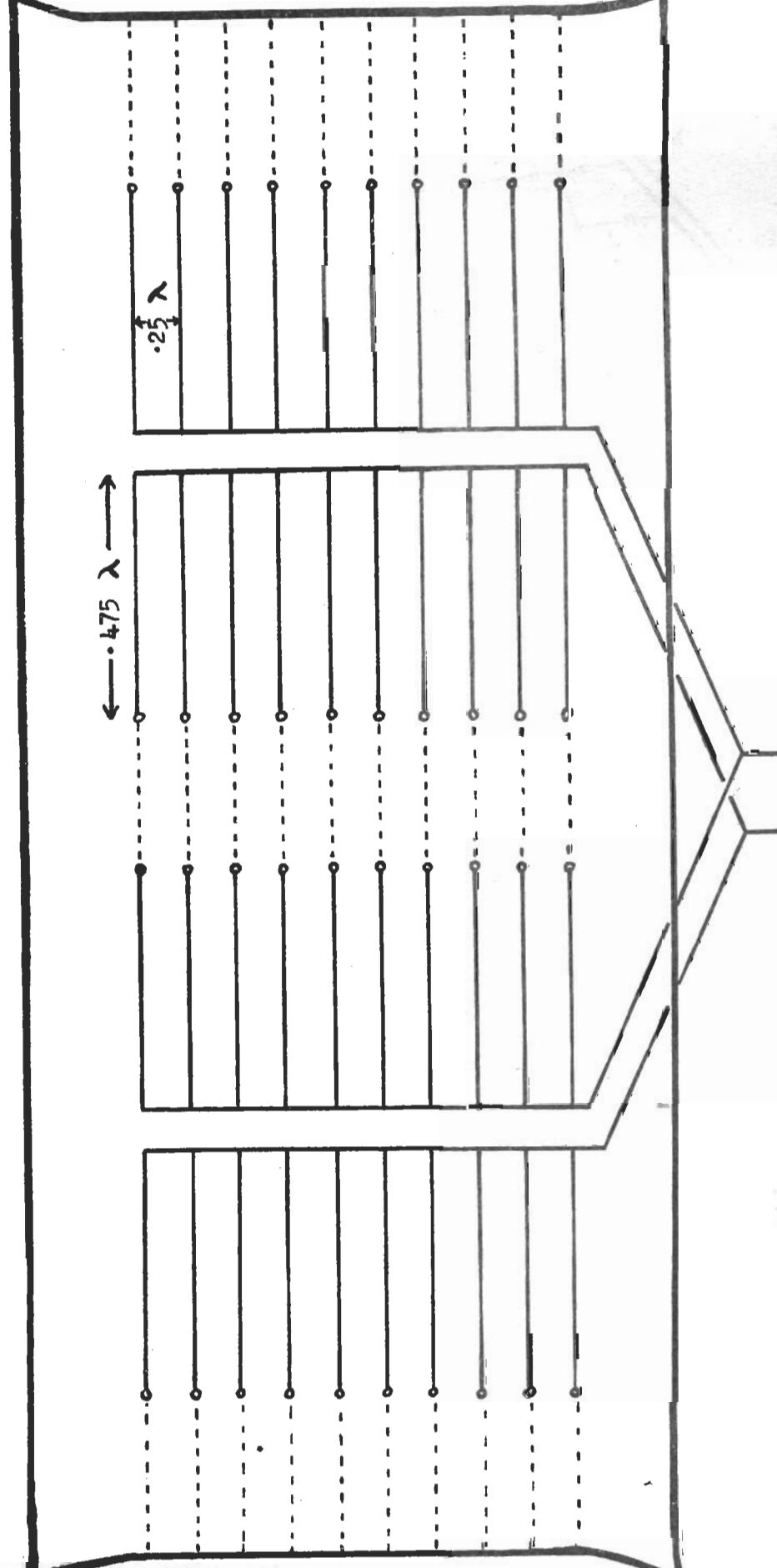
MAST.

MAST

PLAN VIEW.

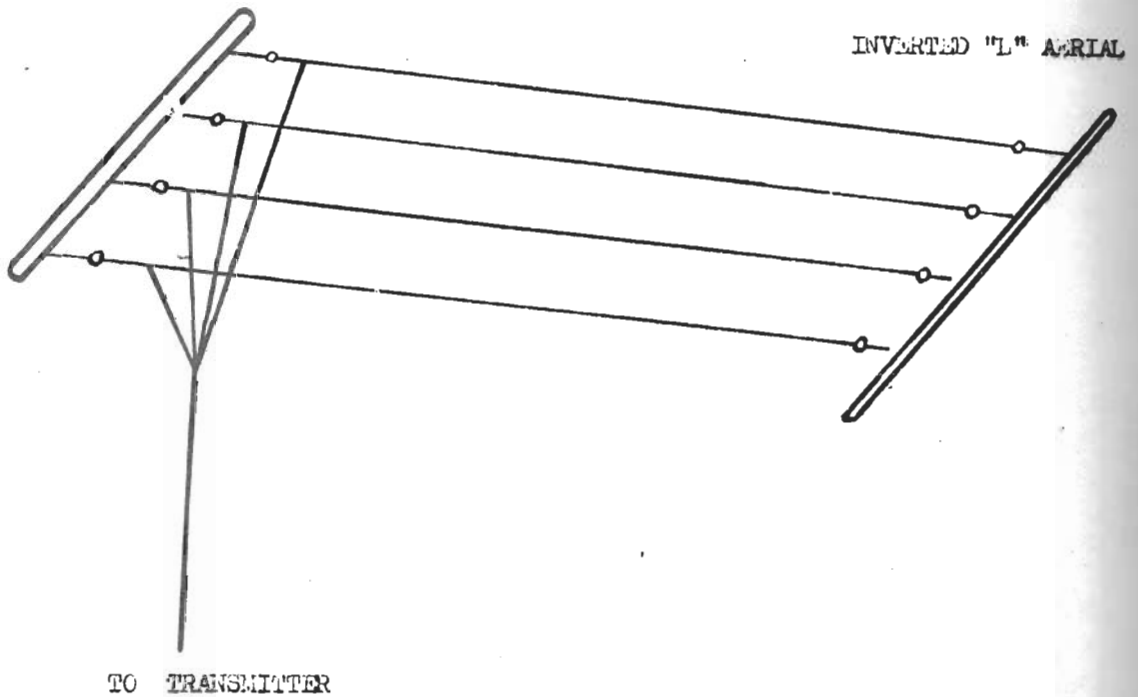
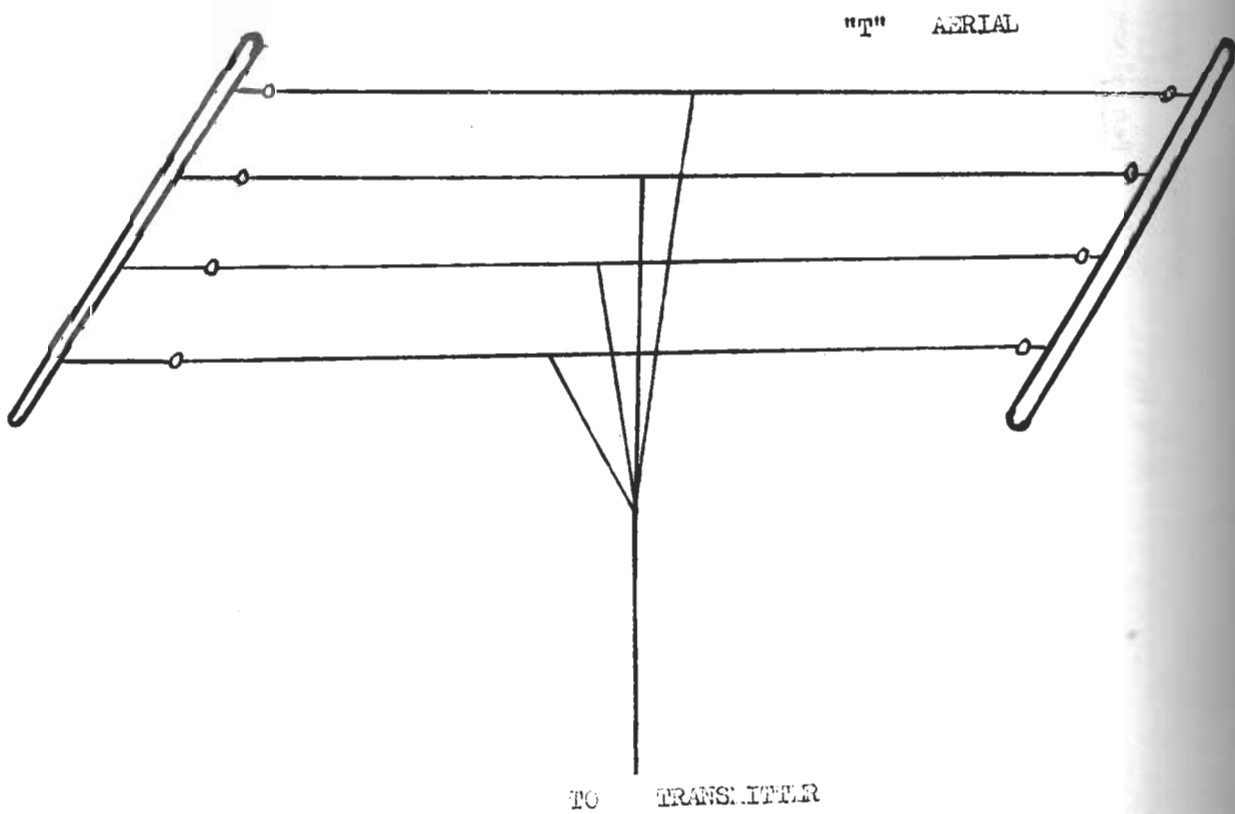
TYPICAL H.A.D. ARRAY.

Ten element normally used.



MAST.

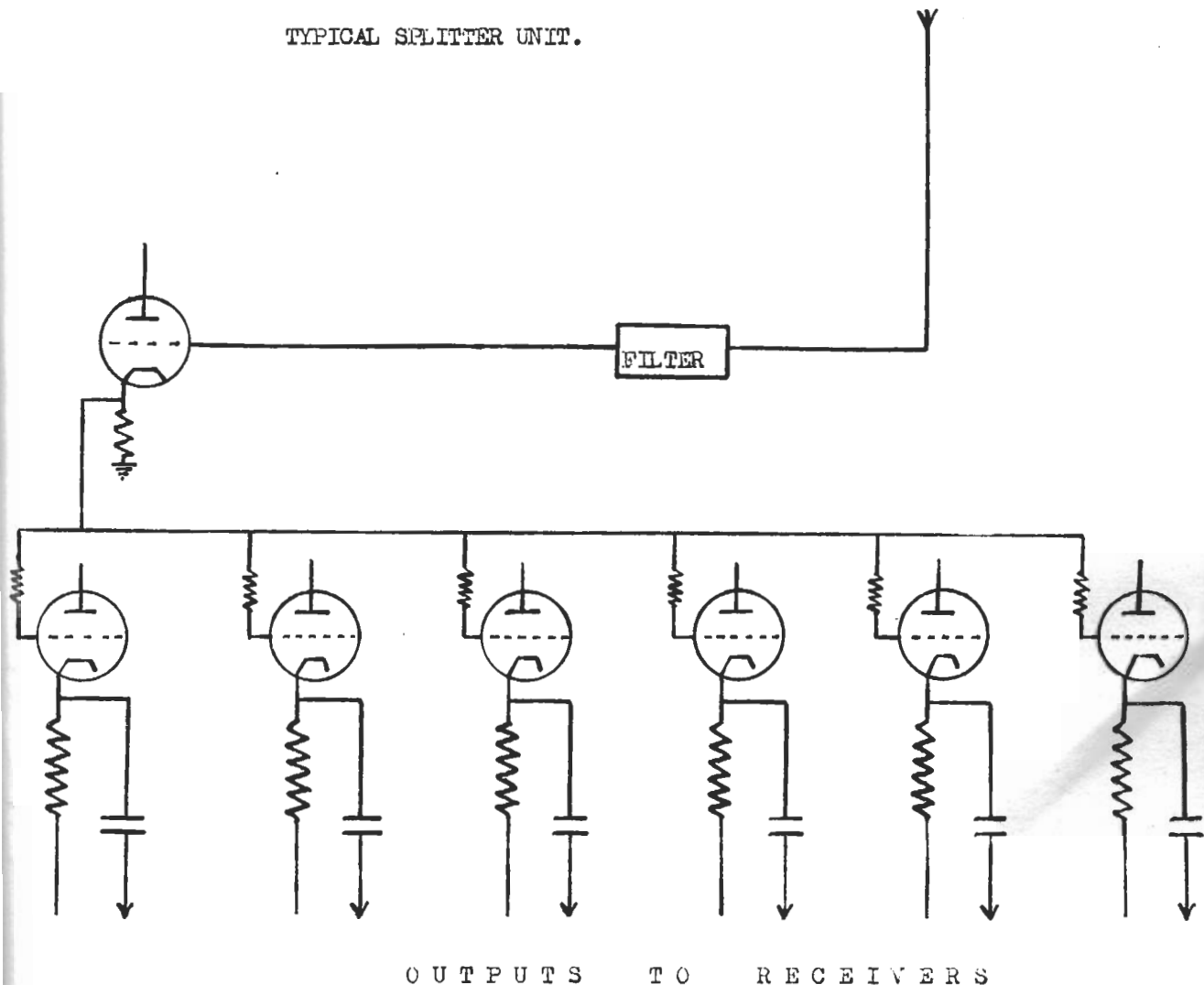
MAST.

4. M F AND L F(a) A roof aerial - (inverted "L").(b) A roof aerial - ("T" Aerial).

AERIAL EXCHANGES1. RECEIVING STATIONS

- (a) Outfits EN and EQ, in addition to acting as receiving aerial exchanges, provide common aerial working facilities. A variety of cathode-follower splitter units are supplied, covering different frequency bands, which enable up to 30 receivers to be fed from 5 to 10 aerials with very little loss, and with no interaction between the receivers. Normally a maximum of six receivers can be fed from one aerial, but if a small loss can be accepted, eleven receivers can be fed by employing two splitters 'in tandem'. That is to say, an output from one splitter is connected to the aerial input of a second.
- (b) These outfits are of considerable value at a large station, since they enable a great reduction in the total number of aerials required and also result in greater efficiency being obtained from those fitted.

TYPICAL SPLITTER UNIT.

2. TRANSMITTING STATIONS

- (a) The modern form of transmission line aerial exchange consists of a semi-circular frame, fitted with vertical and horizontal rails on which contactor trolleys run. The transmission lines from the transmitter are led to insulators mounted on a central pillar, from which each pair is then taken to its respective horizontal travelling trolley.
- (b) The feeder lines to the aerials hang in a short bight between their respective vertical trolleys and the wall insulators through which they are led outside the building.
- (c) To connect a given transmitter to a given aerial all that is necessary is to drive the two trolleys concerned along their rails until their rear contacts meet.

SITING OF SHORE STATIONS

1. The ground should be flat and the soil should have good conductivity. Good agricultural land is the best, but rarely available. Rock or dry sand must be avoided where possible.
2. The aerials should not be screened in any way by rising ground outside the perimeter and an area about 400 yards long must be kept free from any form of obstruction in front of the directional aerials.
3. Receiving stations must be sited as far as possible from transmitting stations, main roads, overhead power lines and built up areas.
4. The siting of-shore stations is a responsibility of A.S.R.E.

TYPICAL SHORE STATIONSINGAPORE1. TRANSMITTERS - SWARA

5	SWB 11E	-	Fixed Services
14	SWB 8	-	3 Fixed services 2 Ship-shore answering 5 Broadcast 2 Load operations 2 Spare
2	TFS 31	-	1 Fixed Service 1 Broadcast
2	617	--	Port Wave etc.
2	89	--	Port Wave etc.
1	TE 435	-	Miscellaneous Voice
2	R 20 A	-	1 Broadcast 1 Spare

2. RECEIVERS - KRANJI

3	Diversity Receivers	-	Fixed services
12	Receivers		

Aerials

Rhombics	-	Fixed services
V.F.T.D.	-	Remaining H.F.
Inverted 'L'	-	M F