RECEIVER OUTFIT CGN

SUMMARY OF DATA

PURPOSE

A dual diversity receiving outfit for use on some Royal Naval Shore Wireless Stations.

TYPE OF RECEPTION

C.W.
Pilot Carrier
Frequency Shift, Wide-band (2550 c/s centre frequency) or Narrow-band (600 c/s centre frequency).

FREQUENCY RANGE

73 kc/s - 30.5 Mc/s when fitted with AR88LF receivers.

PHYSICAL DATA

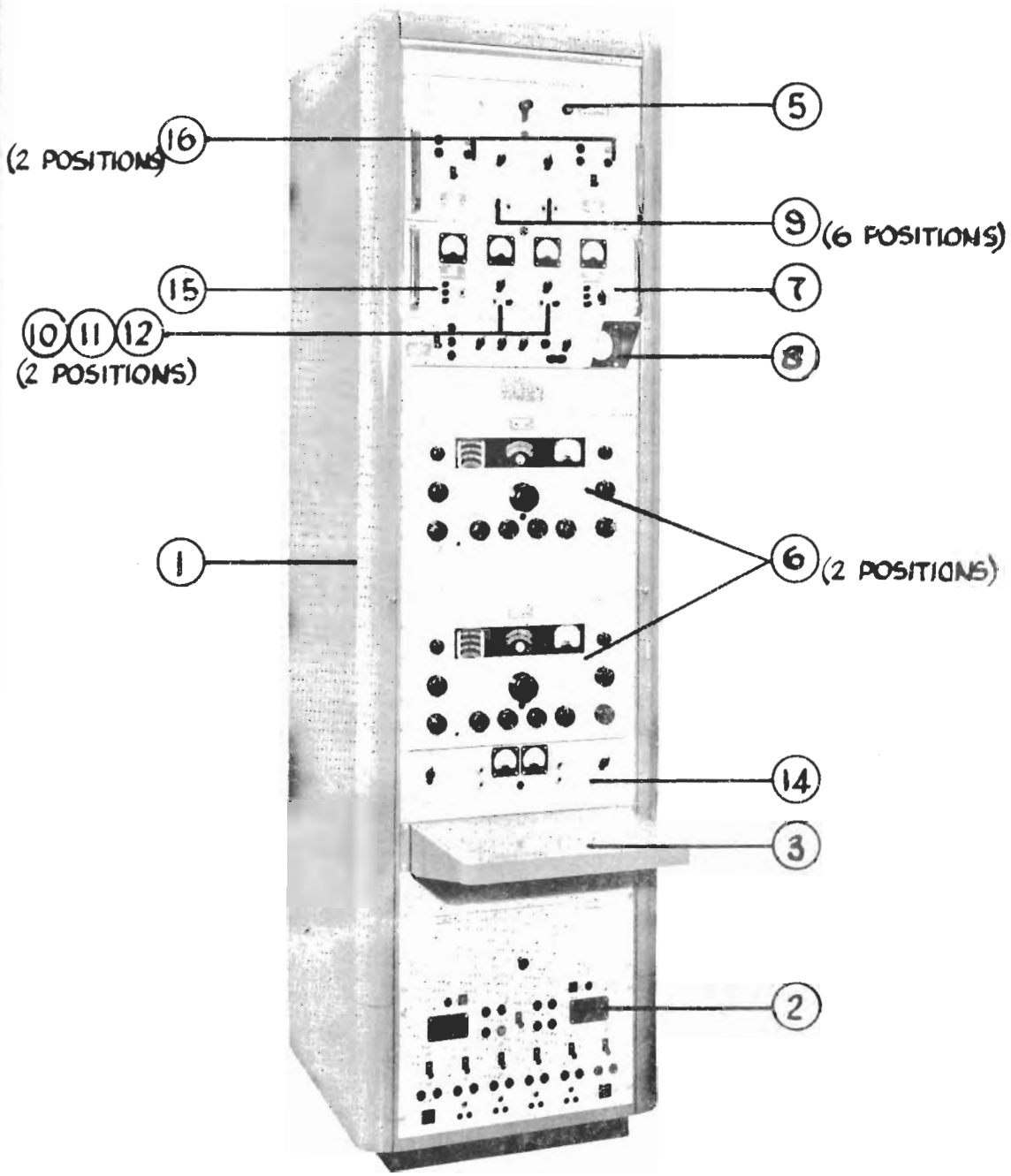
The units are housed in a rack, the overall dimensions of which are:-

Height 7 ft. 1 in., Width 2 ft. $0\frac{1}{2}$ in., Depth 2 ft. 2 in.

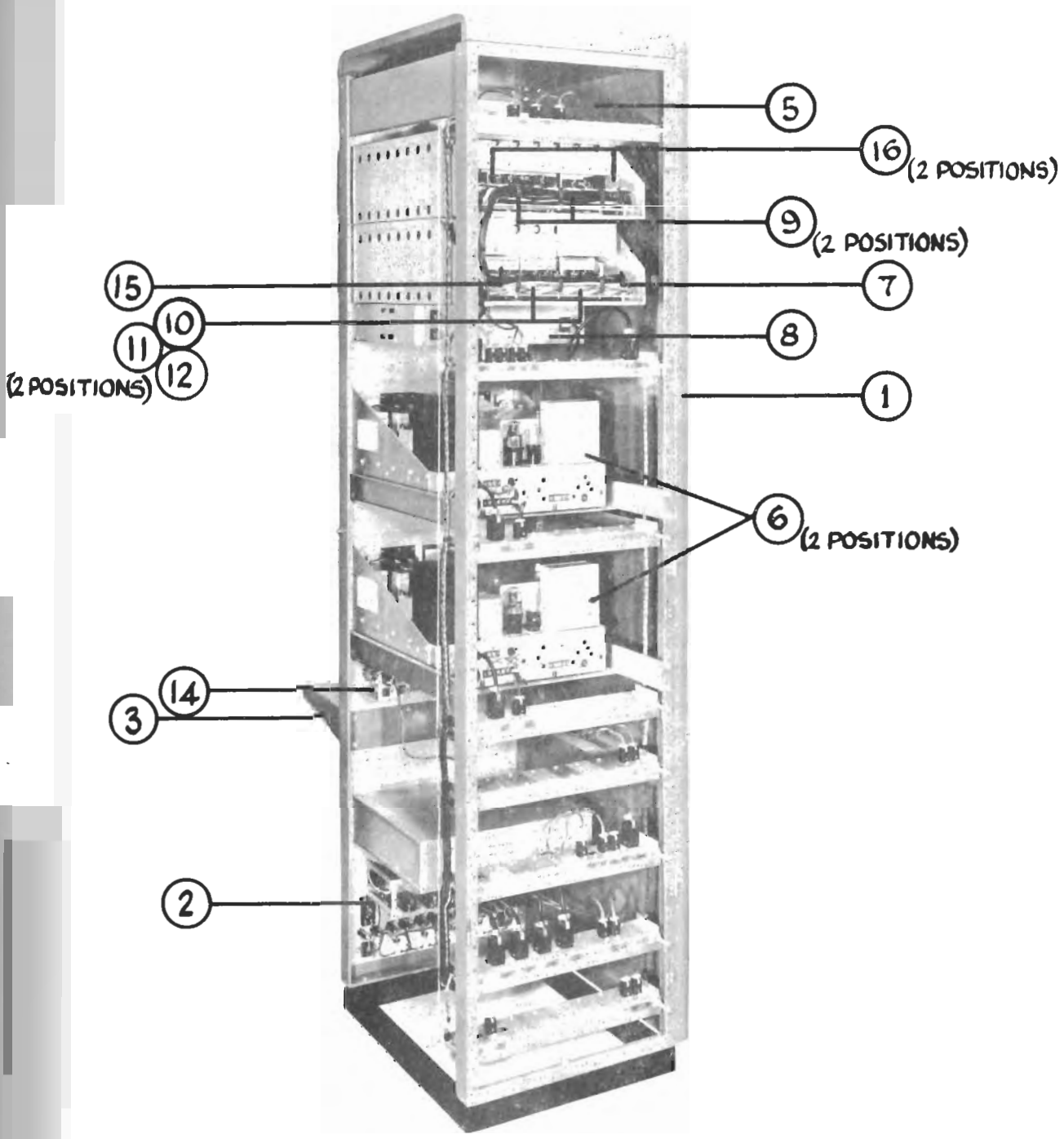
MAJOR UNITS

Items marked with an asterisk (*) are units of Receiver Adaptor Outfit FAD which is issued as part of Receiver Outfit CGN. Items marked + are part of the proprietary Universal Telegraph Receiving Terminal Type FSW.3.

Item Ref. No	A.P. No.	Description	Qty.	Weight
1.	103350	Cabinet DDR5	1	500 lb
2.	103356	Power Control Panel	1	14 lb
3.	103360	Shelf, Writing	1	16 lb
4.	103368	Set of Cableforms, Plugs and Sockets for Outfit CGN	1	-
5.	61648	Control Unit Des. 74 (Undulator Tape)	1	-
6.	-	Receiver Type AR88LF Modified	2	76 lb
7.	67950A	+*Amplifier Unit Des. 8	1	7 lb
8.	67980	*Indicator, Tuning F.S. (visual)	1	20 lb
9.	103351	+*Signal Control and Filter Unit	1	26 lb
10.	103352	+*Limiter Discriminator Chassis	2	9 lb
11.	103353	+*Discriminator Network Wide Shift	2	-
12.	103354	+*Discriminator Network Narrow Shift	2	-
13.	103355	+* Cabinet	2	26 lb
14.	103357	*Monitoring and A.G.C. Switching Unit	1	7 lb
15.	67951	+*Mixer Unit Des. 14	1	9 lb
16.	67952	+*Rectifier Unit Des. 140	2	20 lb



RECEIVER OUTFIT C.G.N.



RECEIVER OUTFIT C.G.N.

(WITH REAR AND SIDE DOOR REMOVED)

BRIEF TECHNICAL DESCRIPTION

Universal Telegraph Receiving Terminal. This is designed to work in conjunction with conventional radio receivers for the reception in dual diversity of pilot carrier, wide or narrow band frequency-shift, or on/off or reversed on/off, hand, or automatic radio morse or radio teleprinter signals. Input impedances of the filters are 600 ohms unbalanced. The terminal will accept these signals at audio frequency and filter, amplify and convert them electronically to d.c. impulses. These impulses are then used for the operation of recording mechanisms such as teleprinters, tape recorders etc., without the aid of an external relay or d.c. supply. The terminal is specially designed for efficient performance on radio circuits where multi-path transmission and large, rapid variations in signal level are experienced. Up to 80 dB of rapid variations in input signal level can be accepted in frequency-shift working and 35 dB in the case of on/off or reversed on/off working. A manual bias correction adjustment circuit is incorporated, which permits the compensation of bias distortion on the circuits and is arranged to extract the maximum intelligence from signals at both high and low keying speeds. The equipment can handle any keying speed up to 100 bauds.

Monitoring and A.G.C. Switching Unit A.P.102357. This unit provides facilities for aural monitoring of the output signals from two receivers, operating separately or in diversity, and checking the signal levels. It also provides for selection of a suitable a.g.c. time constant for the receiver(s) for the type of signal and prevailing propagation conditions. A further switch on the front panel enables the d.c. output pulses from the Telegraph Receiving Terminal to be applied to a Telegraph Distortion Measuring Set for distortion measurements.

Indicator Tuning F.S. (visual) A.P.67980. This unit provides the following facilities:-

1. An instantaneous and accurate indication of the correct receiver tuning for the reception of frequency-shift transmissions.

2. An oscillographic presentation at a.f. of both frequency-shift and c.w. signals to provide information on the propagation conditions of radio communication circuits and the performance of aerials employed in diversity reception.-

3. A pair of terminals on the front panel enabling the c.r.t. to be used for testing purposes.

POWER REQUIREMENTS AND CONSUMPTION

230V, 50 c/s, 330 VA.

AERIAL SYSTEM

Two directional aerials for spaced diversity, or one directional aerial for frequency diversity, or two aerials suitably arranged for polarised diversity.

HANDBOOKS

B.R.1489 Receiver Outfit CGN,
B.R.1345 Receiver AR88LF,
B.R.2040 Cathode Ray F.S. Tuning Indicator.

ESTABLISHMENT LISTS

E.1145 Diversity Receiver Outfit CGN
E.1190 Receiver Adaptor Outfit FAD

INSTALLATION SPECIFICATION

Contained in Handbook.

CHAPTER 1

INTRODUCTION TO RECEIVER OUTFIT CGN

Nature of Equipment

1. Admiralty Receiver Outfit CGN provides for dual diversity reception at R.N. Shore W/T Stations of Communication Signals of various types, and for the conversion of the audio frequency output signals to direct current signals, suitably for the operation of equipment such as teleprinters and undulators.

Composition of the Equipment Fig.1.1, 1.2.

2. Essentially the equipment consists of the following items, mounted in 19 in. B.D.R. rack DDR.5, with detachable side and rear doors, writing shelf and foot recess:-

(a) A universal telegraph receiving terminal (FSW.3), consisting of seven sub-units, assembled into two identical cabinets, designed for 19 in, rack mounting. The function of this terminal, is to adapt the output from conventional receivers, making it suitable for the operation of teleprinters, tape recorders etc., without the aid of an external relay or d.c. supply. The terminal itself is specially designed for efficient performance on radio circuits where multi-path transmission and large, rapid variations in signal level are experienced. Up to 80 dB of rapid variations in input signal level can be accepted in frequency-shift working and 35 dB in the case of ON/OFF or reversed ON/OFF working. A manual bias correction adjustment circuit is incorporated, which permits the compensation of bias distortion on the circuits and is arranged to extract the maximum intelligence from signals at both high and low keying speeds. The equipment can handle any keying speed up to 100 bauds.

The seven sub-units are:-

A.P.103351 Signal Control and Filter Unit (FSW2.1)

A.P.103352 Limiter Discriminator (Chassis)(FSW1.2)

A.P.103353 Discriminator Network Wide Shift

A.P.103354 Discriminator Network, Narrow Shift

A.P.67951 Mixer Unit Design 14 (DDC 1.2)

A.P.67950A D.C. Amplifier Unit (FSW1.1)

A.P.67952 Rectifier Unit Design 140 (DDC1.4)

(b) Two sensitive receivers Type AR88LF (Modified), suitable for the reception of the frequencies from 73 kc/s to 30.5 Mc/s in 6 bands.

(c) A monitoring and A.G.C. Switching Unit (FSM.6). This unit provides facilities for aural monitoring of the output signals from the two receivers, operating separately or in diversity, and checking the signal levels. It also provides for selection of a suitable a.g.c. time constant (out of four provided) for the receiver(s) to suit the type of signal and the prevailing propagation conditions.

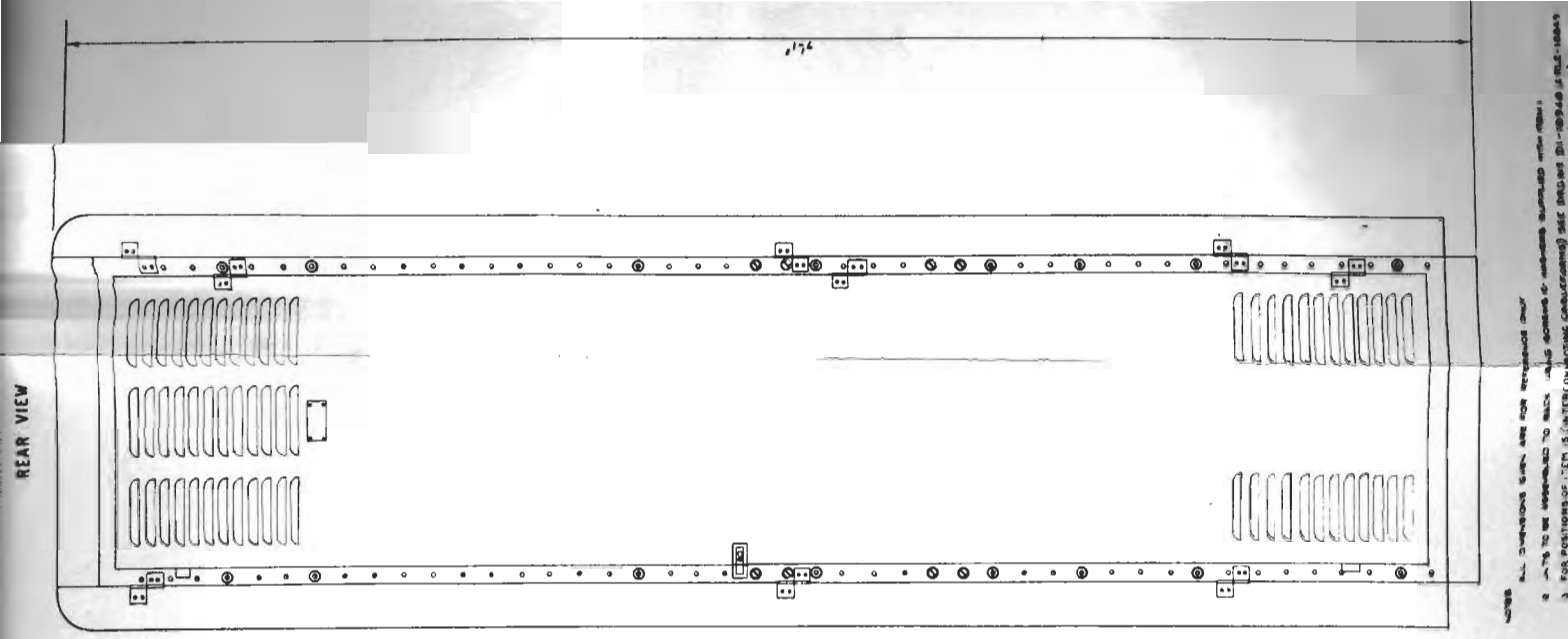
(d) A Cathode Ray Frequency Shift Tuning Indicator (CRM.1). This unit gives an accurate indication of correct receiver tuning for the reception of frequency-shift transmissions. It also provides information on the propagation conditions and the performance of the aerials employed in diversity reception.

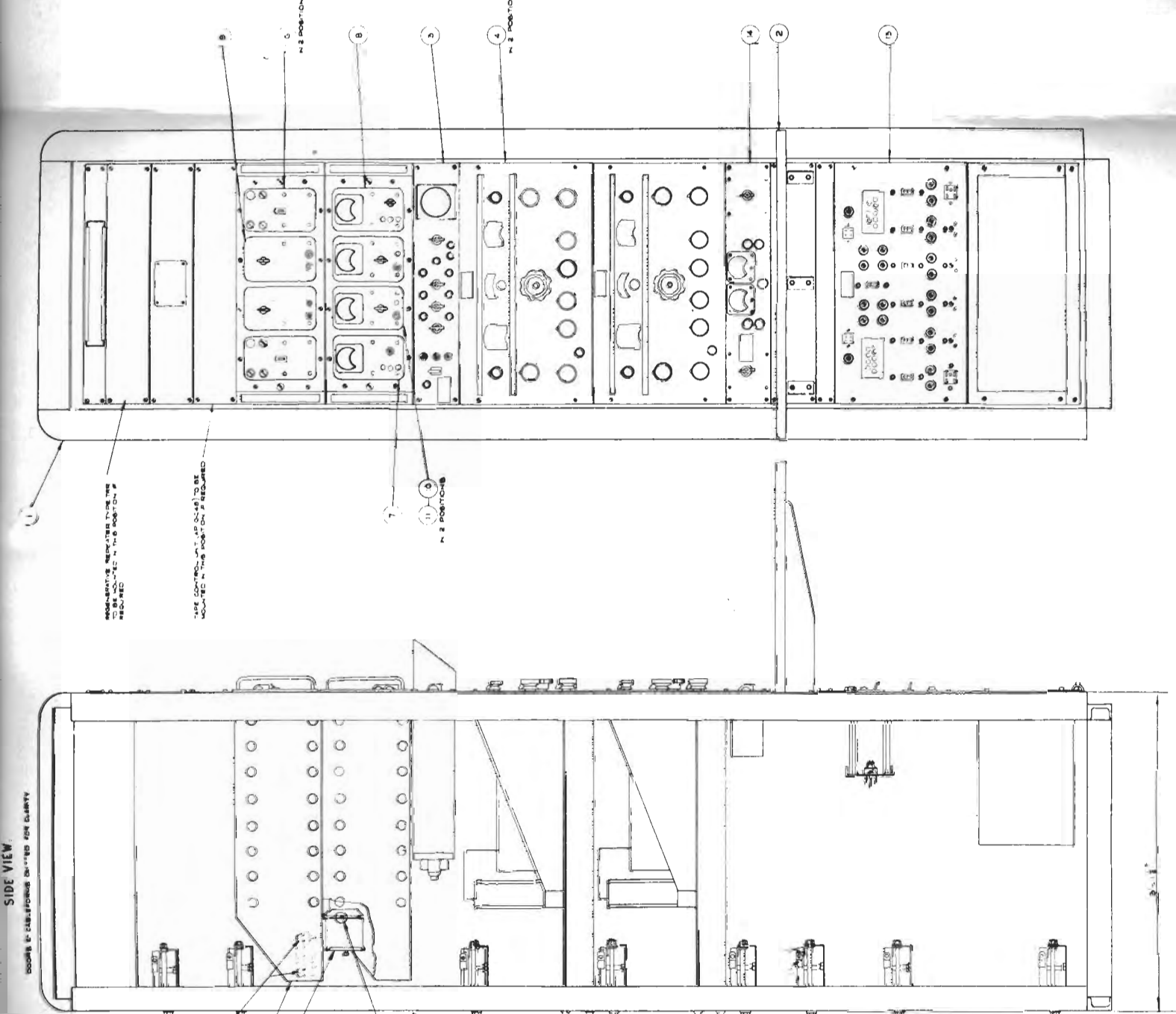
(e) Power Control Panel (DDR.5.1). This unit provides for the distribution of a.c. power to the associated units on the rack, a.c. and d.c. power to teleprinter and undulator motors, and direct current signals to the recording mechanisms. The unit includes fuse protection for all power circuits together with jacks, plugs and sockets, for speedy connection to all ancillary units.

A detailed discussion of all items is given in subsequent chapters.

Aerial System

3. The aerial system will normally be two directional aerials suitably spaced for diversity reception and should be connected to the receivers by coaxial cable of 70 ohm characteristic impedance. A single, directional aerial may be used for frequency diversity, or two aerials suitably arranged for polarised diversity.


REAR VIEW


SIDE VIEW

Earth System

4. All units on the rack are bonded to a common earth terminal located on the base frame. This terminal should be connected to an efficient, signalling earth system.

5. Key to 'circled items' in Fig.1.2.

Item No.	A.P. No.	Name
1	103350	Cabinet DDR.5
2	103360	Shelf, Writing
3	67980	Indicator, tuning F.S. (visual)
4	-	Receiver AR88LF modified
5	67865	Housing Assembly 1.1.1.1
6	67952	Rectifier Unit Des. 140
7	67951	Mixer Unit Des. 14
8	67950A	Amplifier Unit Des. 8
9	103351	Signal Control and Filter Unit
10	103352	Limiter Discriminator Chassis
11	103354	Discriminator Network Narrow Shift
12	103353	Discriminator Network Wide Shift
13	103356	Power Control Panel
14	103357	Monitoring and A.G.C. Switching Unit
15	103368	Cableforms, Plugs and Sockets for outfit CGN.