B.R.4218

Handbook for

RECEIVER OUTFIT CJM

BY COMMAND OF THE DEFENCE COUNCIL

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MINISTRY OF DEFENCE
DIRECTOR GENERAL WEAPONS (NAVAL)
(N/W63539/71)

ANY SUGGESTIONS FOR AMENDMENTS OR ADDITIONS TO THIS BOOK SHOULD BE SUBMITTED TO THE DIRECTOR GENERAL, WEAPONS (NAVAL) THROUGH THE USUAL CHANNELS FOR ONWARD TRANSMISSION TO DWRDS.

BR 4218
Original

AMENDMENT RECORD LEAF

When an amendment to this handbook is incorporated the brief details required below are to be filled in.

AMENDMENT No.	AUTHORITY (P Series No.)	DATE OF INSERTION	INITIALS
Amendments 1-3 are incorporated in this reprint.			
4	P366/84	9-6-86	
5		29.6.89	
6		5/8/93	

Continued Overleaf

BR 4218

HANDBOOK FOR

RECEIVER OUTFIT CJM

CONTENTS

FOREWORD

This book uses Parts 3 and 6 only of the NWS1 seven-part documentation format. BR 4218(MODS) is a separate volume. Associated unit information is given in:

(a) BR 4146 Handbook for Synthesizer, Electrical Frequency 5820-99-519-7000.

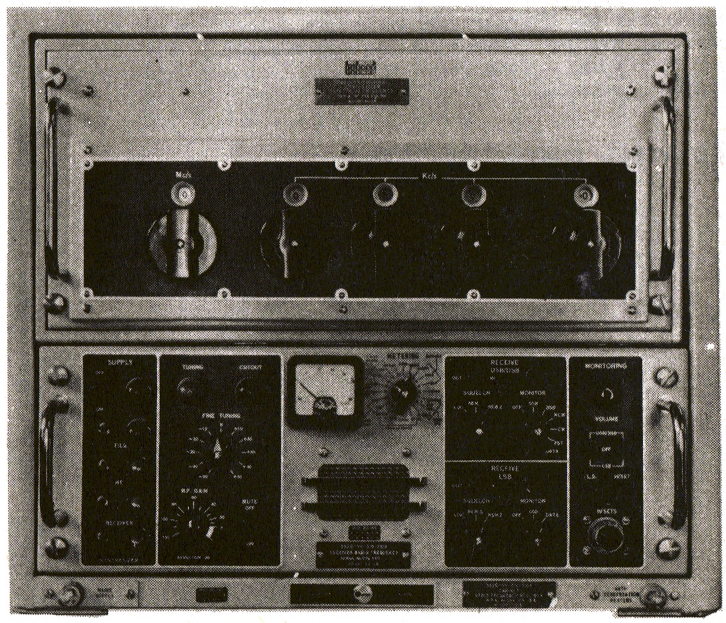
(b) BR 4147 Handbook for Receiver, Radio Frequency 5820-99-519-7019.

RECEIVER OUTFIT CJM

SUMMARY OF DATA

PURPOSE

To provide an automatically tuned, independent sideband receive equipment for HF and limited MF reception in Integrated Communication System Stage 2.



CLASS OF RECEPTION

Modulation: A.M.

Types of Reception: cw
mcw
Telephony
fst
Data

Supplementary Characteristics:

dsb
ssb (usb and lsb)
lsb

FREQUENCY RANGE

HF 1.5 to 27.5 MHz extended to 1.06 to 27.999 MHz with degraded performance.

MF 240 to 525 kHz.

PHYSICAL DATA

Major Units:	Height	Width	Depth	Weight
Cabinet, Radio Frequency Receiver 5820-99-519-7018	1 ft 7 in (483 mm)	1 ft 10 in (559 mm)	1 ft 11¼ in (591 mm)	103 lb (46.4 kg)
Synthesizer, Electrical Frequency 5820-99-519-7000	9⅜ in (238 mm)	1 ft 7⅞ in (502 mm)	1 ft 10⅝ in (576 mm)	60 lb (27.2 kg)
Receiver, Radio Frequency 5820-99-519-7019	7 in (178 mm)	1 ft 7⅞ in (502 mm)	1 ft 10⅝ in (576 mm)	67 lb (30.2 kg)
Switch, Aerial Selector 5820-99-916-4652	9¼ in (235 mm)	4½ in (114 mm)	4¾ in (120 mm)	5¼ lb (2.4 kg)

NOTE Cabinet dimensions do not include the cable entry box which may be fitted on the side or rear, adding 3 in (76 mm) to the width or depth.

BRIEF TECHNICAL DESCRIPTION

The Synthesizer generates output frequencies, selected by five decade controls, from an accurate input frequency of 1 MHz which is usually supplied by Frequency Standard Outfit FSA. Frequency conversion is accomplished by regenerative divider circuits and triple-mix frequency multipliers.

The antenna selector switch connects one of four antenna lines to the Receiver where the input circuits include automatic protection against high r.f. voltages.

Two stages of r.f. amplication using valves, and six automatically tuned circuits precede the first frequency change which produces an i.f. of 4 MHz or 1 MHz, for frequencies above or below 8 MHz. The 4 MHz i.f. is subjected to a second frequency change to produce an i.f. of 1 MHz. The 1 MHz i.f., from the band above or below 8 MHz, is again mixed to produce a final i.f. of 100 kHz.

The output from the Synthesizer at its indicated frequency is inhibited. The three signals which would have been combined to form it are mixed in a Frequency Offset Unit to provide the local oscillation for each frequency change. For speech clarification the synthesised input for the final i.f. may be replaced by one from a manually controlled oscillator.

The final i.f. at 100 kHz is supplied to two receiver channels, one for usb, dsb and the other for lsb reception. In each channel there are four stages of i.f. amplification all subject to A.G.C., the time constants for which are automatically varied with the type of reception set.

Demodulation is effected by an envelope detector for dsb reception and by balanced modulators for ssb reception. The amplified audio output from each channel can be switched to a built in loudspeaker or monitored by headphones at one of three Receiver outputs, one local and two remote.

The class of reception is selected by front panel system switches which control diode switches to select the appropriate circuits.

For automatic tuning purposes, the r.f. tuning circuits are disposed into six frequency ranges. The circuits for the appropriate range are automatically selected by a rotary solenoid system which is positioned by setting the MHz control on the Synthesizer. The circuits thus selected are then servo tuned to the required frequency, the servo reference voltage being determined by the positions of the MHz, 100 kHz, 10 kHz and 1 kHz controls.

ELECTRICAL CHARACTERISTICS

1 MHz standard frequency input:	0.5 V to 1 V into 75 ohms or more than 1 kilohm.
Aerial input impedance:	75 ohms. Two coaxial sockets are provided for C.A.W.
Sensitivity:	1 μV antenna e.m.f. to give 1.4 V output into 220 ohms.
Selectivity:	Image and i.f. rejection better than 100 dB.
Noise Factor:	10 dB ± 2 dB.
A.G.C. characteristics:	On ssb the a.f. output level is held constant within 3 dB for an increase in input level from 2 μV to 1 V equivalent antenna e.m.f.
	On dsb the a.f. output level is held constant within 3 dB, for any constant percentage modulation, on carrier levels from 2 μV to 0.5 V equivalent antenna e.m.f.
Audio output levels:	2 V ± 2 dB into 200 ohms from each sideband. 0.15 mW into 600 ohms at sideband monitor jacks. Up to 1 mV into 600 ohms at headset jack and socket, via volume control. Up to 1 W at loudspeaker, via volume control.
Frequency stability:	Same as 1 MHz standard on exact multiples of 1 kHz. ± 0.25 Hz on intermediate 100 Hz steps. ± 1 Hz short term, ± 5 Hz long term when using FINE TUNING control.

POWER REQUIREMENTS

100 to 130 V or 200 to 260 V, 50 to 60 Hz single-phase a.c.
70 W normal, 150 W during the tuning sequence of about 1 second.
115 V or 230 V a.c. or d.c. 50 W for anti-condensation heaters.

HANDBOOKS

BR 4218
BR 4146 Handbook for Synthesizer, Electrical Frequency 5820-99-519-7000.
BR 4147 Handbook for Receiver, Radio Frequency 5820-99-519-7019.

ESTABLISHMENT LIST

S1526

INSTALLATION SPECIFICATION

B1106

BR 4218 Pt.3
Amdt 1, 5.73

PART 3

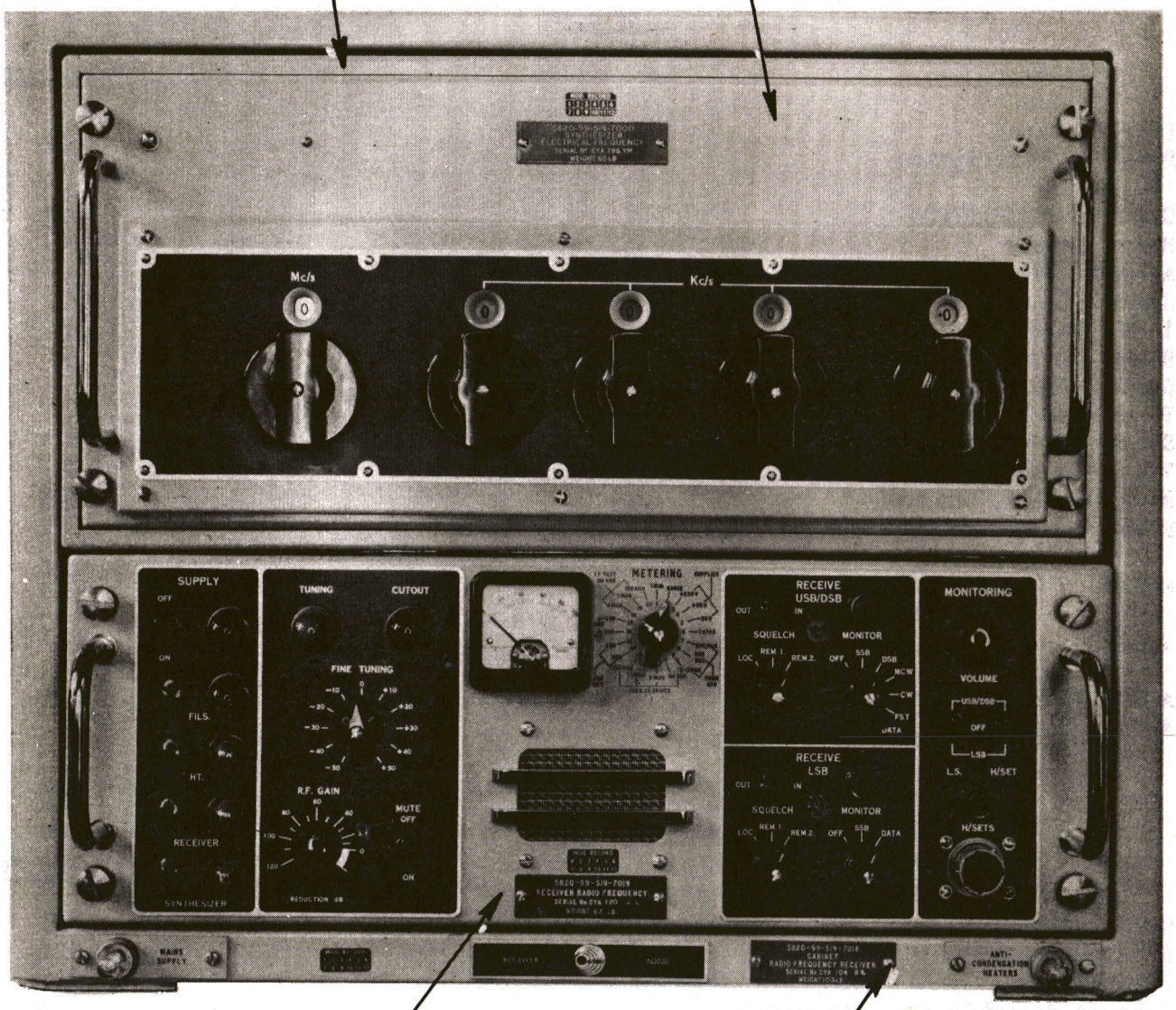
EQUIPMENT INFORMATION

CHAPTER 1

TECHNICAL DESCRIPTION

CONTENTS

ILLUSTRATIONS



RECEIVER OUTFIT CJM

FIG. 1.1

CHAPTER 1

TECHNICAL DESCRIPTION

Introduction

1. Receiver Outfit CJM is an independent sideband equipment for HF and limited MF reception designed for use in Integrated Communications System Stage 2. Suitable for attended or unattended reception, it tunes automatically to the frequency set on the decade controls of its frequency synthesizer which is referenced to an external frequency standard.

2. In ICS2 the receivers are monitored by the Control and Monitoring Desk. Unattended receivers are normally sited in the Communication Control Room Receiver Section (Compartment 'A') and attended receivers are normally sited in the Main Communication Office.

3. Receiver Outfit CJM may also form part of a Monitoring Assembly. In later installations this is replaced by an arrangement using Panel Signal Distribution Radio which is part of Transmitter Drive Outfit TDC.

4. An Outfit CJM is fitted in the Local Maintenance Annexe. It may be sited separately, or with an Outfit TDC to form an assembly.

5. Switch, Aerial Selector is not fitted in the Monitoring and L.M.A. Assemblies.

Physical Description

Figures 1.1, 1.2, 1.3

6. The outfit comprises two drawer units, Receiver, Radio Frequency 5820-99-519-7019 and Synthesizer, Electrical Frequency 5820-99-519-7000, fitted into a Cabinet, Radio Frequency Receiver 5820-99-519-7018. An Aerial Selector Switch 5820-99-916-4652, mounted externally on the side of the cabinet, is also included. The drawer units are mounted on telescopic runners and secured by captive screws.

NOTE The Synthesizer escutcheon and its fittings are supplied with the cabinet.

7. The same drawer units are used in Type 641 Transmit Receive Equipment and the same Synthesizer is used in Transmitter Drive Outfit TDC.

8. To assist in component location the Synthesizer, Receiver and Cabinet are designated A, B and E1 respectively. Sub-assemblies in the equipment are numbered as shown in BR 4146 and BR 4147. So a convenient means of referring to units and components is formed, eg A5C4 is capacitor C4 in the Frequency Multiplier (1 kHz) in the Synthesizer; B3VT8 is transistor VT8 in the Frequency Offset Unit in the Receiver; E1R3 is resistor R3 in the cabinet.

NOTE The coding is unique to Receiver Outfit CJM. Similar designations are used in Type 641 and Outfit TDC but they are not common to all three equipments.

9. External connections are made through two 20-way taper pin terminal blocks E1-TS1, TS2 in the base of the cabinet. Associated with each block is a printed wiring board carrying capacitors for r.f. filtering of the incoming leads. The drawer units and sub-assemblies inside the cabinet are interconnected by plug and socket cable assemblies.

10. There are two 25 W anti-condensation heaters E1-HR1, HR2 inside the cabinet, one on each side near the base, with a preset voltage selector switch E1SA in the base.

11. Neon indicators E1-LP1, LP2 for MAINS SUPPLY and ANTI-CONDENSATION HEATERS are fitted on the lower flange of the cabinet.

12. Two transistors E1-VT2, VT3 associated with the Receiver, Power Supply are mounted inside the cabinet on the left-hand side of the upper bay. Also associated with the Receiver and mounted in the base of the cabinet are three attenuating resistors E1-R4, R5, R6, two signal relays E1-RLA, RLB and a small printed wiring board, the 1 MHz Metering Board.

13. The cabinet is intended for bench mounting on shock mounts and two or three cabinets may be stacked vertically together. Slinging points are normally fitted to the adjacent deckhead to facilitate assembly and removal of the drawer units.

14. Control and Supply cables enter the cabinet through a ferrule box and plate which is fitted either on the right-hand side or at the back of the cabinet. R.F. cables are connected to coaxial adaptors in the ferrule plate and to connectors on the Aerial Selector Switch.

15. The Aerial Selector Switch is a rotary switch which connects the Receiver in series with one of four antenna lines, designed so that the antenna lines are not open circuit during its operation. The switch assembly is housed in a die cast aluminium box and the knob position indicates the antenna line in use.

16. Cooling is by normal convection, the heat dissipated being extracted from the compartment air. Maximum heat dissipation is 150 W and the ambient temperature should not exceed 55 ^{o}C.

CIRCUIT DESCRIPTION Figure 1.4

17. Functional details of the Synthesizer and Receiver and their correlation are given in BR 4146 and BR 4147. This description is confined to the cabinet connections and circuits and to the interconnections between the drawer units.

Mains Supply

18. Mains and anti-condensation heater supplies are run via an external "Mains ON - Anti-condensation heaters OFF" switch.

19. The mains supply at E1TS2-25, 26 is connected to the Receiver at B1PLAA-Z, X and to neon indicator E1LP1 via E1R2, E1R3. The mains at B1PLAA-Z, X supplies both Receiver and Synthesizer via the Receiver SUPPLY ON-OFF switch. The Synthesizer is supplied from a 0.5 A fuse in the Receiver via B1PLAA-M, J to A1PLBB-1, 2.

20. The 25 W heaters are supplied via E1TS2-22, 23 and change-over switch E1SA1 which connects them either in series or in parallel. E1SA1 is set to suit the supply voltage and a retaining label is fitted. Neon indicator E1LP2 is connected via E1R1 across one heater.

NOTE The primary voltage taps on mains transformers A1TR2 and B14TR1 must be connected to suit the a.c. mains supply. See BR 4146, Pt.5B; BR 4147, Pt.5B.

Antenna IN

21. The r.f. input from the Switch, Aerial Selector at E1SKTA, PLA is fed to the Receiver at B2PLAD which is connected via the R.F. Input Filter Assembly to B2PLAL which provides the antenna output for C.A.W. via B1SKTAL and E1PLD, SKTD.

22. For single antenna, single receiver working a short circuited terminating socket would be fitted to B2PLAL (see BR 4147 Pt.5A Chapters 1 and 2). This is not used in Outfit CJM installations.

Signal Relays

23. Relays in the base of the cabinet are used for remote indication purposes or for switching the Receiver output to a relaying transmitter.

24. An input signal above the A.G.C. threshold level will operate E1RLA on usb, E1RLB on lsb. E1RLA is controlled by a drive amplifier on Panel Automatic Gain Control, unit B8(B8A). E1RLB is similarly controlled by unit B9(B9A)

1 MHz Standard

25. 1 MHz from Frequency Standard Outfit FSA at E1SKTB is fed via E1PLB to the Receiver at B2PLAG which is connected to the 1 MHz Limiter, unit B25.

26. B2PLAG is also connected directly to B2PLAF from which 1 MHz is fed to the Synthesizer at A7PLBD for the Frequency Divider and Frequency Multiplier (MHz) circuits. A 1 MHz output (to another synthesizer) can be taken from A7PLBE via A1SKTBH and E1PLC, SKTC but this facility is not normally used.

27. The 1 MHz Metering Board provides a smoothed d.c. voltage at B1PLAA-P, proportional to the level of the 1 MHz input at E1PLB, for position 1 of the Receiver METERING switch.

Range Control Supplies

28. +41 V at B1PLAA-a is from the Receiver Power Supply at B14PLAV-BB via relay contact B1RLB1 and it supplies rotary solenoid B2SA via B2PLAC-A. The rotary solenoid is energised through and drives its homing wafer B2SA2F which is connected via B2PLAC-C, D, E, F, H, J and A2PLCB-P, R, S, T, U, V to range switch A2SWA7 in the Synthesizer.

29. -41 V return from A2SWA7 is connected via A2PLCB-J, B1PLAA-c to the Panel Receiver Auxiliary Circuits at B6PLC-15 and from B6PLC-14 to the Receiver Power Supply at B14PLAV-AA.

30. -41 V at B2PLAC-U is the spark quench return from the rotary solenoid switch contact B2SA1F. It is connected to A2PLCB-H which is common with the -41 V supply at A2PLCB-J.

During Tune Supplies

31. -30 V at B1PLAA-W is from the Receiver Power Supply at B14PLAV-Y via B1TS2-20. It supplies the servo reference potentiometer in the Synthesizer through A2PLCB-E.

32. The d.c. output level from the servo reference potentiometer at A2PLCB-A represents the frequency set on the Synthesizer and controls the tuning servo in the Receiver via B1PLAA-L.

Tune Interlock

33. When the frequency is changed by operating one of the Synthesizer decade controls the tune interlock line via A1PLBB-3 and B1PLAA-e operates a trigger circuit in Panel Receiver Auxiliary Circuits, unit B6, which controls -30 V and -22 V supplies to the tuning servo.

NOTE E1VT2, E1VT3 are the control transistors for +30 V and -30 V stabilised supplies for the Receiver. They are mounted on the cabinet for heat dissipation.

Synthesizer Outputs

34. To avoid spurious response problems in the Receiver, the normal output of the Synthesizer at A2PLBC is terminated in 75 ohms by A2SKTBC. Its component frequencies at A2PLBP, A2PLBQ, A2PLBR are taken via B3PLAH, B3PLAK, B3PLAJ to the Frequency Offset Unit in the Receiver where they are mixed to produce the local oscillator frequency.

35. The 100 kHz output from the Synthesizer at A7PLBG is taken via B2PLAE to the 100 kHz A.F. Oscillator, unit B22, and Panel Demodulator, unit B7(B7A) it also provides the 100 kHz input to the Synthesizer at A4PLCZ after attenuation by E1R4, E1R5, E1R6.

VLF Adaptor

36. Supplies and services to a VLF adaptor are available, if required, at E1TS2-33 to 40 from B1PLAA-A to F, H, K. A first oscillator output for the same purpose is provided from the F.O.S.U. Wide-band Amplifier at 24PLAM.

Receiver A.F. Outputs

37. A.F. outputs from Amplifier Audio Frequency, unit B5(B5A), are taken via B1PLAA-HH, EE to E1TS2-29, 30 for the local position; via B1PLAA-CC, AA to E1TS2-1, 2 and via B1PLAA-W, Y to E1TS2-10, 11 for the remote positions.

38. Metering and r.f. gain lines to Panels Automatic Gain Control units B8(B8A) and B9(B9A) at B1PLAA-p, t, v, s are connected to remote positions via E1TS2-8,17, 9, 18.

Filtering Capacitors

39. A 0.1 uF capacitor is connected from each incoming lead on E1TS1, E1TS2 to Earth via Printed Wiring Boards 5820-99-521-9396 and 5820-99-521-9397.

MUTING

40. External control of muting is by a relay contact in the Transmitter Control Unit which applies -30 V to the A.G.C. line through the receiver MUTE ON-OFF switch and Diode Board DB2, unit B17.

SQUELCH

41. Each sideband output has a squelch circuit controlled by Panel Automatic Gain Control, unit B8(B8A) or B9(B9A). It can be switched IN or OUT by the appropriate SQUELCH switch on the Receiver front panel.

ASSOCIATED EQUIPMENTS

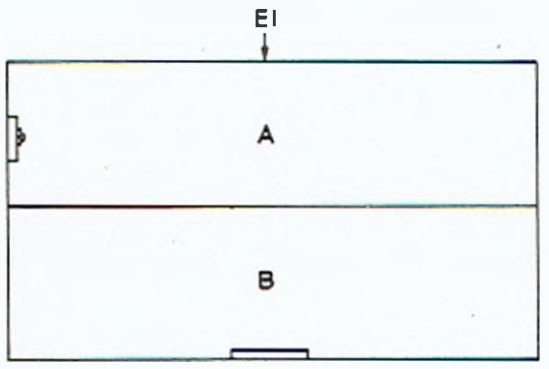
42. Receiver Outfit CJM is used in conjunction with the equipments in the following list.

Integrated Communication System Stage 2. BR 4176.
Transmitter Drive Outfit TDC. BR 4219.
Transmit Receive Equipment Type 641. BR 4144.
Common Aerial Outfit EAO(4). BR 4216.
Common Aerial Outfit EAT(1)(2). BR 2360.
Receiver Aerial Exchange Outfit EZ(4). BR 4103.
Frequency Converter Outfit FTA(1). BR 4126.
Monitor and Remote Control Outfits KMM Series. BR 4125.
Frequency Standard Outfits FSA(5)(6)(7). BR 2445.

Aerial Outfits

43. Outfit CJM is normally connected to two HF lines and one up-converted VLF/LF/MF line, through Aerial Exchange Outfit EZ(4), for common antenna working. The up-converted line is from Frequency Converter Outfit FTA(1), mounted on top of an Outfit CJM cabinet.

44. A line from private receiver Common Aerial Outfit EAT is wired to the Local Maintenance Annexe for the Outfit CJM which is used for testing.

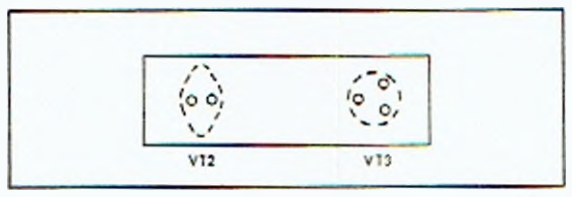


SUB-ASSEMBLY A SYNTHESIZER, ELECTRICAL FREQUENCY 5820-99-519-7000
SUB-ASSEMBLY B RECEIVER RADIO FREQUENCY 5820-99-519-7019
SUB-ASSEMBLY E1 CABINET, RADIO FREQUENCY RECEIVER 5820-99-519-7018

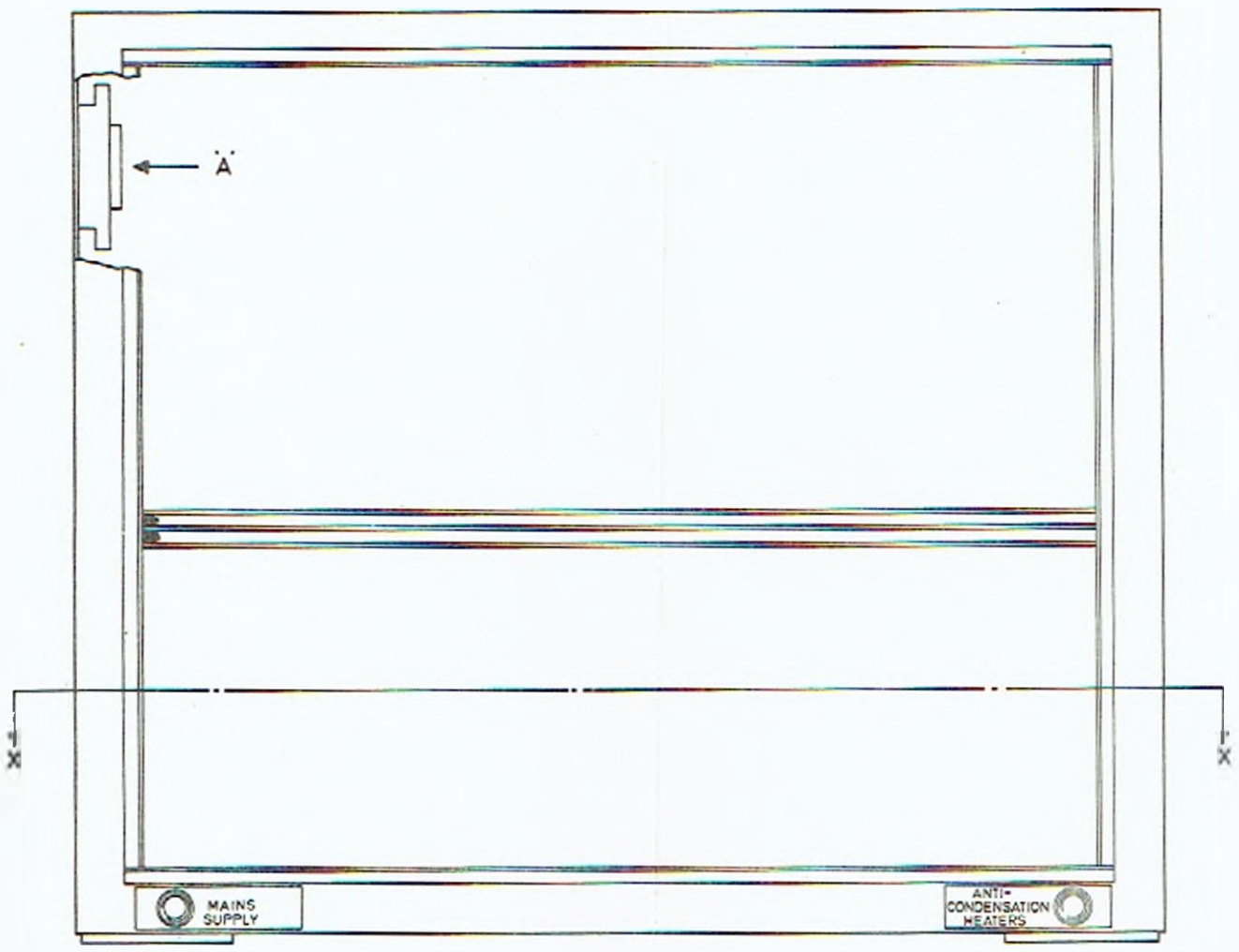
MOD RECORD
1 2 3 4 5 6
7 8 9 10 11 12

RECEIVER OUTFIT CJM
COMPONENT LOCATION

FIG.1.2



PART VIEW IN DIRECTION OF ARROW 'A'

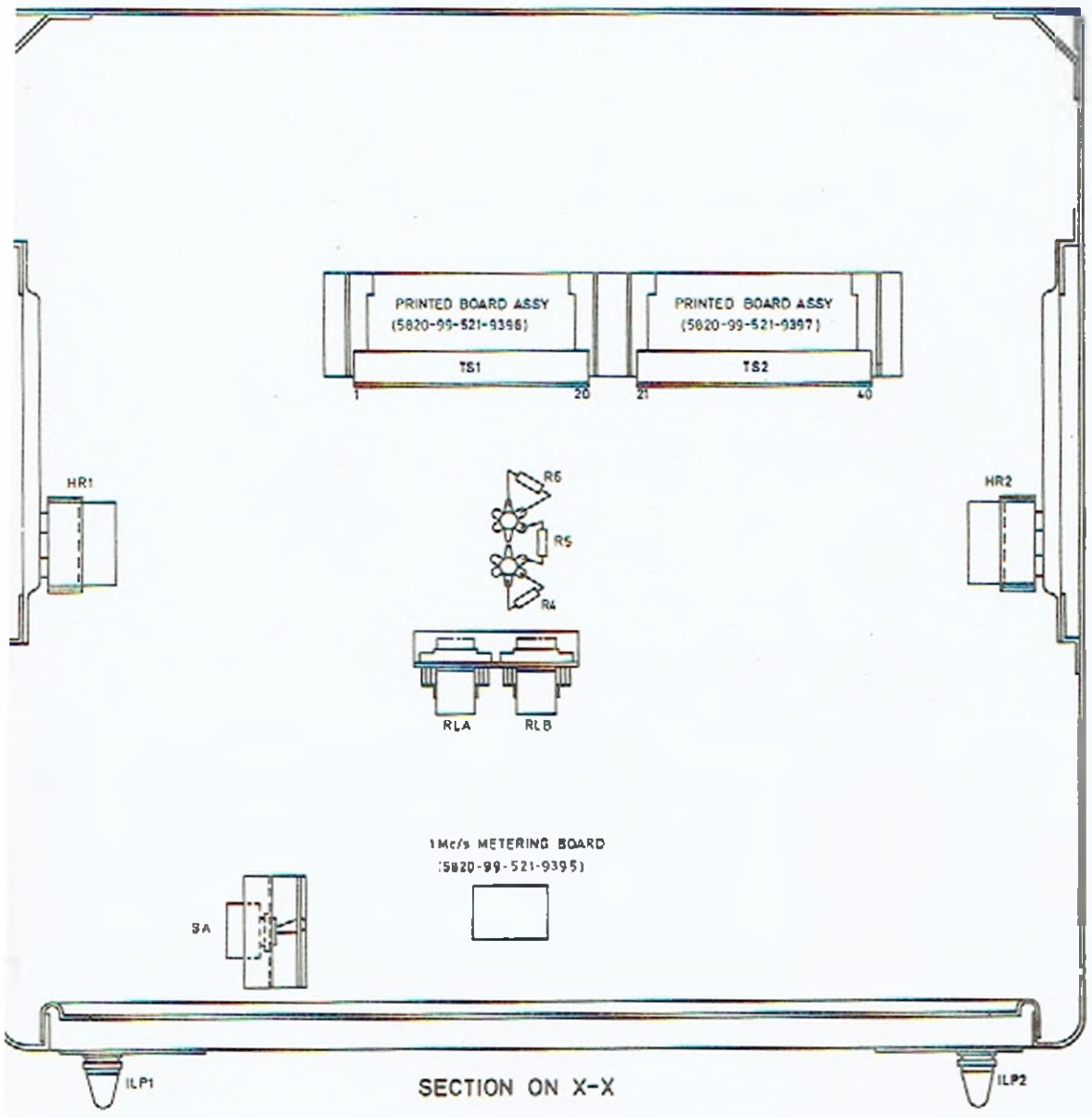


FRONT VIEW OF CABINET

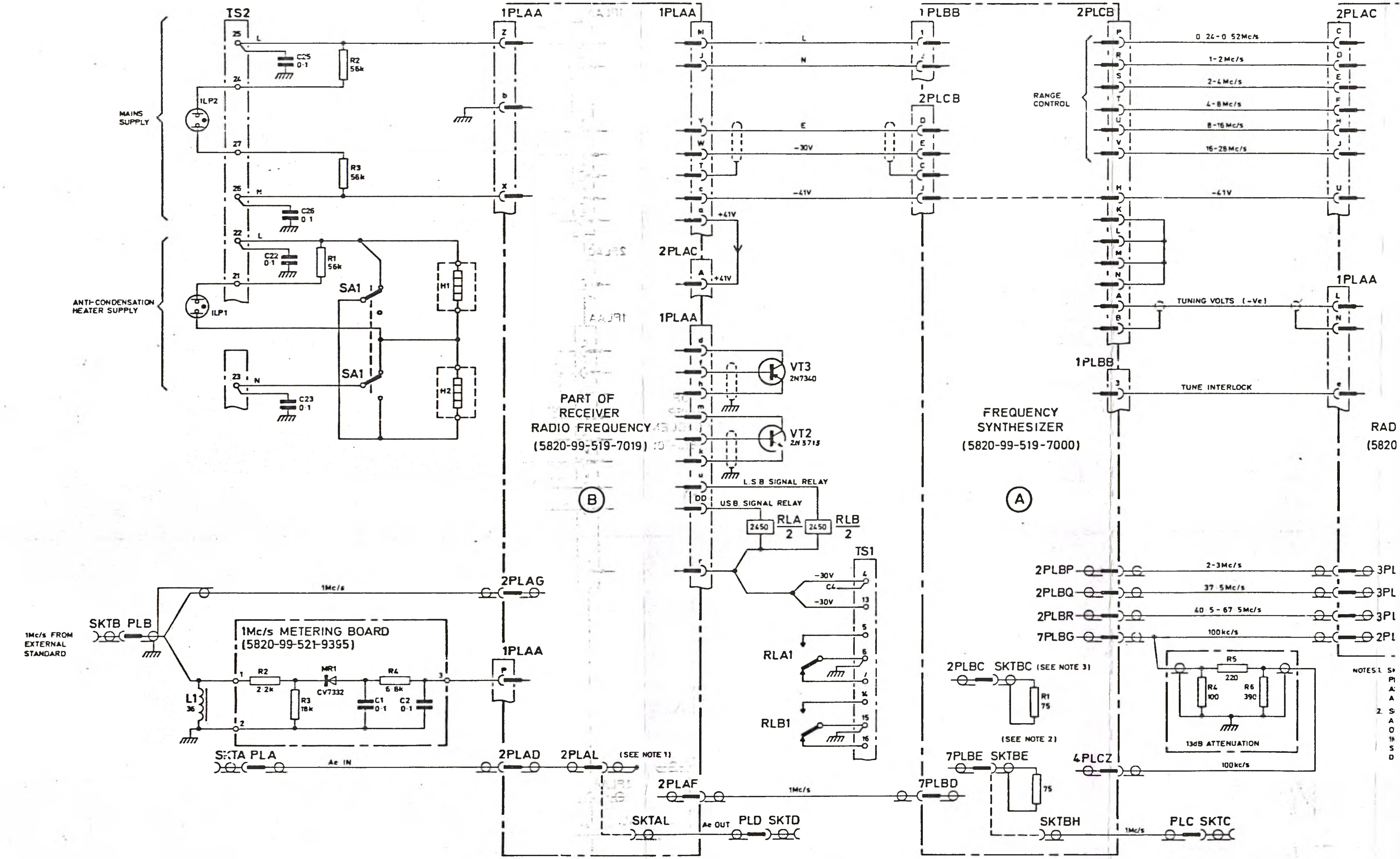
RECEIVER OUTFIT CJM

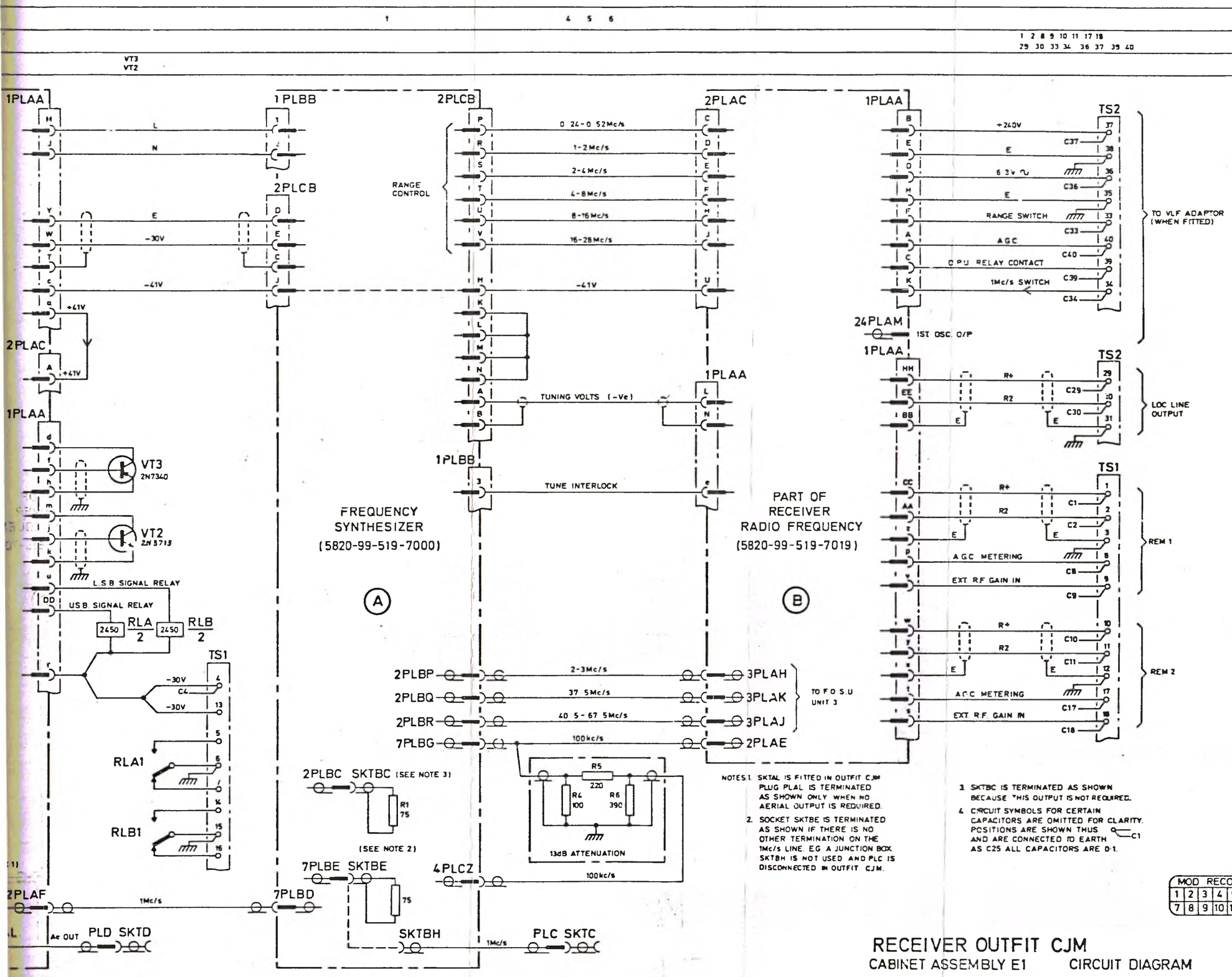
CABINET ASSEMBLY E1 COMPONENT LAYOUT.

FIG. 1.3



RES.	2 1 2 3 4 1 4 5 6
CAP	25 26 22 23 1 2
MISC.	L1 MR1 SA1 VT3 VT2





NOTES:
1. SKTAL IS FITTED IN OUTFIT CJM PLUG PLAL IS TERMINATED AS SHOWN ONLY WHEN NO AERIAL OUTPUT IS REQUIRED.
2. SOCKET SKTBE IS TERMINATED AS SHOWN IF THERE IS NO OTHER TERMINATION ON THE 1Mc/s LINE. E.G. A JUNCTION BOX. SKTBH IS NOT USED AND PLC IS DISCONNECTED IN OUTFIT CJM.
3. SKTBC IS TERMINATED AS SHOWN BECAUSE THIS OUTPUT IS NOT REQUIRED.
4. CIRCUIT SYMBOLS FOR CERTAIN CAPACITORS ARE OMITTED FOR CLARITY. POSITIONS ARE SHOWN THUS —C1 AND ARE CONNECTED TO EARTH AS C25 ALL CAPACITORS ARE 0·1.

MOD RECORD					
1	2	3	4	5	6
7	8	9	10	11	12

RECEIVER OUTFIT CJM

CABINET ASSEMBLY E1 CIRCUIT DIAGRAM

FIG.1.4

CHAPTER 2

CABINET COMPONENTS

CONTENTS

COMPONENTS LISTS

Cabinet Radio Frequency Receiver 5820-99-519-7018
1 MHz Metering Board 5820-99-521-9395

CHAPTER 2

CABINET COMPONENTS

Introduction

1. Functional details of the components mounted in the cabinet are given in Chapter 1, or in BR 4146 and BR 4147. As there is no separate handbook for the cabinet this Chapter is formed by the relevant Components Lists.

CABINET, RADIO FREQUENCY RECEIVER 5820-99-519-7018

COMPONENTS LIST

NOTE Before ordering parts, refer to relevant E List and BR 1923 - Substitution Guide.

Cct. Ref.	NSN or MARCONI NO	Description	Value	Tol. ± %	Rating
		CABLE ASSEMBLIES			
	M32-5466-01				
	M32-5466-7				
	M32-5466-08				
	M32-5923-02				
	M32-5923-03				
	M32-5924-02				
	M32-5927-10				
	M32-5928-01				
	M32-5933-01				
	M32-6114-01				
	M32-6114-02				
	M32-6114-03				
	M32-6069-01				
		CAPACITORS	/uF		V
C1	PC.19655-7	Met. Polycarbonate	0.1	20	100
C2	PC.19655-7	Met. Polycarbonate	0.1	20	100
C4	PC.19655-7	Met. Polycarbonate	0.1	20	100
C8	PC.19885-1	Polyester, Metallised	0.01	20	250
C9	PC.19655-7	Met. Polycarbonate	0.1	20	100
C10	PC.19655-7	Met. Polycarbonate	0.1	20	100
C11	PC.19655-7	Met. Polycarbonate	0.1	20	100
C17	PC.19885-1	Polyester, Metallised	0.01	20	250
C18	PC.19655-7	Met. Polycarbonate	0.1	20	100
C19	PC.19655-7	Met. Polycarbonate	0.1	20	100
C22	5910-99-112-8628	Polyester	0.01	10	400
C23	5910-99-112-8628	Polyester	0.01	10	400
C25	5910-99-112-8628	Polyester	0.01	10	400
C26	5910-99-112-8628	Polyester	0.01	10	400
C29	PC.19655-7	Met. Polycarbonate	0.1	20	100
C30	PC.19655-7	Met. Polycarbonate	0.1	20	100
C32	PC.19885-1	Met. Polyester	0.1	20	250
C33	PC.19655-7	Met. Polycarbonate	0.1	20	100
C34	PC.19655-7	Met. Polycarbonate	0.1	20	100
C36	PC.19655-7	Met. Polycarbonate	0.1	20	100
C37	5910-99-112-8628	Polyester	0.01	10	400
C39	PC.19655-7	Met. Polycarbonate	0.1	20	100
C40	PC.19885-1	Polyester, Metallised	0.1	20	250
C101	PC.19669-1		0.01	20	250
C102	PC.19669-1		0.01	20	250

CABINET, RADIO FREQUENCY RECEIVER 5820-99-519-7018

COMPONENTS LIST (Contd.)

Cct. Ref.	NSN or MARCONI NO	Description	Value	Tol. ± %	Rating
HR1	WIS.10321-B Ref. 9	Heating Element			
HR2	WIS.10321-B Ref. 9	Heating Element			
L1	H33-0283-02	Coil Assembly			
	5970-99-932-5404	Insulator Stand-Off			
LP1	6240-99-996-9213	Lamp Neon Indicator			
	PC.48352-1	Lampholder fitment, Cap for ILP1			
LP2	6240-99-996-9213	Lamp Neon Indicator			
	PC.48352-1	Lampholder fitment, Cap for ILP2			
		PLUGS			
PLA	5935-99-972-8285				
PLB	5935-99-972-8285				
PLC	5935-99-972-8285				
PLD	5935-99-972-8285				
	5905-99-	RESISTORS	Ohms		W
R1	022-3007		56 k	10	0.25
R2	022-3007		56 k	10	0.25
R3	022-3007		56 k	10	0.25
R4	013-5850		100	2	0.5
R5	013-5858		220	2	0.5
R6	013-5864		390	2	0.5
RLA	PC.65430-1	Relay, 2 pole Plug-in			
RLB	PC.65430-1	Relay, 2 pole Plug-in			
	PC.66239-1	Socket for Relay			
SA	5930-99-051-0504	Switch, Double Pole, Changeover 3 A, 250 V			
SKTA	PC.60026-1	Adaptor R.F. Coaxial			
SKTB	PC.60026-1	Adaptor R.F. Coaxial			
SKTC	PC.60026-1	Adaptor R.F. Coaxial			
SKTD	PC.60026-1	Adaptor R.F. Coaxial			
		SOCKETS			
SKTAA	PC.58370-2	50-way Top Entry			
SKTAC	5935-99-524-3726	20-way			
SKTAD	PC.60213-1	R.F. Coaxial			
SKTAE	PC.60226-1	R.F. Coaxial			
SKTAF	PC.60213-1	R.F. Coaxial			

CABINET, RADIO FREQUENCY RECEIVER 5820-99-519-7018

COMPONENTS LIST (Contd.)

Cct. Ref.	NSN or MARCONI NO	Description	Value	Tol. ± %	Rating
		SOCKETS (Contd.)			
SKTAG	PC.60213-1	R.F. Coaxial			
SKTAH	PC.60213-1	R.F. Coaxial			
SKTAJ	PC.60213-1	R.F. Coaxial			
SKTAK	PC.60213-1	R.F. Coaxial			
SKTAL	PC.60213-1	R.F. Coaxial			
SKTBB	5935-99-580-1504	6-way			
SKTBD	PC.60226-1	R.F. Coaxial			
SKTBE	PC.60226-1	R.F. Coaxial			
SKTBG	PC.60226-1	R.F. Coaxial			
SKTBP	PC.60213-1	R.F. Coaxial			
SKTBQ	PC.60213-1	R.F. Coaxial			
SKTBR	PC.60213-1	R.F. Coaxial			
SKTCB	PC.58305-1	18-way Side Entry			
SKTCZ	PC.60226-1	R.F. Coaxial			
TS1	PC.77413-1	Terminal Block			
	5820-99-521-9396	Printed Board Assembly for TS1			
TS2	PC.77413-1	Terminal Block			
	5820-99-521-9397	Printed Board Assembly for TS2			
		TRANSISTORS			
VT2	5961-99-141-9050	2N3713			
VT3		Motorola 2N3740			

1 MHZ METERING BOARD 5820-99-521-9395

COMPONENTS LIST

NOTE Before ordering parts, refer to relevant E List and BR 1923 - Substitution Guide.

Cct. Ref.	NSN or MARCONI NO	Description	Value	Tol. ± %	Rating
		CAPACITORS	**µF**		**V**
C1	PC.19655-7	Met. Polycarbonate	0.1	20	100
C2	PC.19655-7	Met. Polycarbonate	0.1	20	100
MR1	5960-99-037-2302	Diode CV7127			
		RESISTORS	**Ohms**		**W**
R2	5905-99-013-5882		2.2 k	2	0.5
R3	5905-99-013-5904		18 k	2	0.5
R4	5905-99-013-5894		6.8 k	2	0.5

CHAPTER 1

RECEIVER OUTFIT CJM SETTING-TO-WORK

CONTENTS LIST

TEST RECORD SHEETS

CHAPTER 1

RECEIVER OUTFIT CIM SETTING-TO-WORK

TEST EQUIPMENT

1. The following test equipment is required:- (or CRETE authority replacements).

(a)	Signal Generator AF	6625-99-543-5163
(b)	Signal Generator RF	6625-99-541-9092
(c)	50 ohm 20 dB Pad	5905-99-580-0510
(d)	50 to 75 ohm Matching Pad	5905-99-580-0511
(e)	Voltmeter Set (True RMS)	6625-99-543-9894
(f)	Multimeter	6625-99-943-1524
(g)	Frequency Counter	6625-99-767-6349
(h)	Resistor 220 ohm $\frac{1}{8}$ watt	(Composition or Metal Oxide)
(j)	Headset	A.P.0558/198307

FUSE LINKS

2. Before placing units into their appropriate drawer check the fuses - see Table 1.1.

Table 1.1 Fuses

FUSE DESIGNATION	RATING	
	200-250V	100-125V
Receiver (FS3)	1 Amp	2 Amp
Synthesizer (FS4) (on Receiver panel)	0.25 Amp	0.5 Amp

PRELIMINARY CHECKS

3. Carrying out the preliminary checks given in the Handbook for RECEIVER, RADIO FREQUENCY BR 4147 Vol 1 Part 5B Chapter 1, Paragraphs 1 to 18 and the Handbook for SYNTHESIZER, ELECTRICAL FREQUENCY BR 4146 Section B, Chapter 2, Paragraphs 1 to 4. The transformer connections for the Receiver R.F. are given in Table 1.2.

Table 1.2

Connections for Transformer (WIS.5697 Sh.583) used on Receiver, R.F. M30-1052-01

Supply Volts	Winding A Lead No. 2 To Terminal	Winding B Lead No. 1 To Terminal	Link Between Terminals Wdg.A - Wdg.B and Wdg.A - Wdg.B			
100	100	0	100	100	0	0
105	100	5	100	100	5	5
110	110	0	110	110	0	0
115	110	5	110	110	5	5
120	120	0	120	120	0	0
125	120	5	120	120	5	5
130	130	0	130	130	0	0
135	130	5	130	130	5	5
200	100	0	0	100		
205	100	5	0	100		
210	100	5	5	100		
215	100	0	5	110		
220	110	0	0	110		
225	110	0	0	110		
230	110	5	5	110		
235	110	0	5	120		
240	120	0	0	120		
245	120	5	0	120		
250	120	5	5	120		
255	120	0	5	130		
260	130	0	0	130		
265	130	5	0	130		
270	130	5	5	130		

ANTI-CONDENSATION HEATERS AND INDICATORS

4. Put the MAINS ON/ANTI-CONDENSATION HEATERS changeover switch to ANTI-CONDENSATION HEATERS. Check that the anti-condensation heater in the cabinet is working and that the associated indicator lamp is lit.

MAINS SUPPLY INDICATION

5. Put the MAINS ON/ANTI-CONDENSATION HEATERS changeover switch to MAINS ON. Check that the ANTI-CONDENSATION HEATERS lamp is extinguished and the MAINS SUPPLY lamp on the cabinet is lit.

SWITCHING ON, TUNING AND CHECK OF OPERATING LAMPS

6. Put the supply switch on the Receiver, Radio Frequency to ON. Check that the SUPPLY lamp on the Receiver and the dial lamps on the Synthesizer are lit and that the TUNING and CUT OUT lamps light for approximately one second. Check also that the appropriate channel ON lamp is lit when any mode of reception is selected by the USB/DSB or LSB system switch, but that the LSB channel ON lamp is extinguished in any mode when the USB system switch is at DSB or MCW. Check that the Receiver automatically follows any change in the Synthesizer frequency, indicated by the TUNING lamp on the Receiver.

SYNTHESIZER

7. Carry out the procedure given in BR 4146 Section 5B, Chapter 1, Paragraphs 5 to 13.

RECEIVER OVERLOAD PROTECTION UNIT

8. Proceed as follows:-

(1) Apply +30 V (which can be taken from PLE5 when the Amplifier, Audio Frequency is connected via the extension panel) to 2 TP1 (adjacent to PLAL) to cause the Overload Protection Unit to operate. Verify that the audio output disappears and that the CUTOUT lamp lights. Set the METERING switch to position 17 (AGC-LSB) and verify that the meter reading is approximately 65. Remove the +30 V from 2 TP1 and verify that conditions remain unchanged.

(2) Switch off the Receiver, wait a few seconds and switch it on again. Verify that the audio output returns, that the CUTOUT lamp is extinguished and that only a small AGC voltage is present as set by the r.f. gain.

RECEIVER METERING CHECKS

9. Check the meter readings for each position of the METERING switch and record the results on the Metering Test Record Sheet.

AGC PERFORMANCE

► 10. Carry out the tests in BR 4147(2), Section 5C, Chapter 1, Paragraphs 67(1) to 67(13) inclusive using the following test equipment:-

(a)	Signal Generator		6625-99-541-9092
(b)	Matching Pad	(TM6599)	5905-99-580-0511
(c)	Attenuator Pad	(TM5573)	5905-99-580-0510
(d)	Voltmeter Set (True RMS)		6625-99-543-9894
(e)	220 ohm 1/8 watt resistor (composition or metal oxide)		

SIGNAL-TO-NOISE RATIO AND SENSITIVITY CHECKS

11. Carry out the tests in BR 4147(2), Section 5C, Chapter 1, Paragraphs 64(1) to 65 inclusive.

REMOTE LINE SENSITIVITY CHECKS

12. Proceed as follows:-

(1) Repeat Paragraphs 64 and 65 for REM1 and REM2 positions of USB output switch but on 12 MHz only. To obtain REM1 and REM2 outputs connect the voltmeter to points PLE31, 32 and PLE16, 27 respectively.

(2) Record results on test record sheet. ◄

RECEIVER FREQUENCY CHECK

13. Check the Frequency Synthesizer of a TDC available for test purposes. (As detailed in the TDC Setting-to-Work.) At the Panel, Signal Distribution, Radio connect the Drive Unit to be used for testing to the TUNED FILTER position. Proceed as follows:-

(1) On the test Drive Unit select a frequency of 1.111 MHz. Set USB to LOCAL-CW, LSB to OFF and DRIVE ATTENUATOR to 30 dB.

(2) At the Aerial Exchange EZ ensure a Filter is housed in the Tuning Bay.

(3) Set all Receivers that are available to testing to the following conditions. AERIAL SELECTOR switch to position 4, LSB OFF, USB to CW REM. 1, R.F. GAIN to 0 dB, FINE TUNING control to 0 and select 1.111 MHz at the Synthesizer Dials.

(4) At the Filter Tuning Unit set the ATTENUATOR to 10 dB and a Receiver switch to the first Receiver to be tested. Connect a frequency counter via a jack plug to the appropriate AUDIO OUTPUT MONITOR jack socket.

(5) PRESS the TUNE switch of the test TDC and insert a shorted jack plug in the KEY socket. The Counter should READ 1000 Hz ± 2 Hz.

(6) Set the Receiver FINE TUNING control to -50 Hz, then +50 Hz the Counter should read 1050 ± 7 Hz and 950 ± 7 Hz respectively. Reset the FINE TUNING control to 0.

(7) At the Filter Tuning Unit select the second receiver to be tested. Check as in (5) and (6). Subsequently select each receiver and test it.

(8) At the TDC synthesizer and all CJM synthesizers under test, dial the following frequencies.

(9) Select each receiver in turn at the Filter Tuning Unit for each of the frequencies and test as described in (5).

2.2222 MHz
3.3333 MHz
↓
9.9999 MHz
10.0000 MHz
11.0000 MHz
↓
27.0000 MHz

NOTE: If a TDC is not available this check can be carried out by the reception of a signal from any standard derived source.

(10) Restore all Receivers and the Drive Unit to normal working.

RECEIVER MUTING

14. Link up a Transmitter to the receiver being checked via Receiver Output Exchange, TCU and CCX. Put 'MUTE' switch to 'ON'. Select CW on USB panel of Receiver and switch on. Select CW on USB panel of Transmitter Drive Unit and switch on. Check that when the transmitter is keyed the Receiver is muted. Receiver muting can be checked aurally and also by the Receiver meter, which, on METERING positions 16 and 17 should read between 80 and 100 when muting. If the CUT OUT lamp lights when key is pressed check that it is extinguished when key is released.

SHIP _____

DATE _____

UNIT	SERIAL NO
CABINET	
RECEIVER	
SYNTHESIZER	

RECEIVER METERING TEST RECORD

Receiver Condition: SYNTHESIZER set to any frequency except as stated in the remarks column. SQUELCH switched OFF. USB/DSB and LSB system switches OFF. R.F. GAIN maximum (fully clockwise).

Para. 9

METERING SWITCH		NORMAL READING	READING OBTAINED	REMARKS
POSN	TITLE			
1	1 MHz	35–100		
2	RANGE (1)	10 ± 3		0.240 0.525 MHz
	(2)	20 ± 3		1.0 1.99 MHz
	(3)	30 ± 3		2.0 3.9 MHz
	(4)	40 ± 3		4.0 7.9 MHz
	(5)	50 ± 3		8.0 15.9 MHz
	(6)	60 ± 3		16.0 -27.9 MHz
3	SUPPLIES) +230 V	36–44		
4	) +30 V	56–64		
5	) -30 V	56–64		
6	1 K1 + 2	49–69		
7	) 37.5 MHz	> 2		
8	FROM SYN) VAR. OSC.	> 2		
9	) 2.3 MHz	> 8		
10	) 1ST OSC.	> 2		/Varies with freq
11/	FREQ CH)	50–80)		(above 3 MHz
	DRIVES) 3 MHz	0)		(bleow 8 MHz
12	) 1.1 MHz	45–85		
13	) 100 kHz	55–85		
14	AGC DET) USB	< 10		
15	) LSB	< 10		
16	AGC) USB	2–6		
17	) LSB	2–6		
*18	I.F. TEST) 4 MHz	< 10		below 8 MHz
	ON DSB)	60 approx		above 8 MHz
*19	) 1 MHz	60 approx		below 8 MHz
*20	) 100 kHz	60 approx		

* On positions 18, 19 and 20 set the USB/DSB system switch to DSB and the R.F. GAIN to 20 dB. (Aerial Disconnected).

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SHIP _____

DATE _____

UNIT	SERIAL NO
CABINET	
RECEIVER	
SYNTHESIZER	

RECEIVER SIGNAL TO NOISE RATIO RECORD

Para. 12

FREQUENCY (MHz)	SIGNAL TO NOISE (dB)	SENSITIVITY (VOLTS)
0.245		
0.300		
0.525		
1.050		
1.500		
1.900		
2.000		
3.000		
3.900		
4.000		
6.000		
7.900		
8.000		
12.000		
15.900		
16.000		
22.000		
27.900		
2.500		
2.500		
2.500		
2.500		
2.500		
2.500		
2.500		

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SHIP _____

DATE _____

UNIT	SIGNAL NO
CABINET	
RECEIVER	
SYNTHESIZER	

REMOTE LINES RECEIVER SENSITIVITY TEST RECORD

Para. 13

USB OUTPUT SWITCH POSITION	READING OBTAINED
REM1	
REM2	

CHAPTER 2

RECEIVER OUTFIT CJM - HARBOUR

ACCEPTANCE TRIAL

CONTENTS LIST

TEST RECORD SHEETS

CHAPTER 2

RECEIVER OUTFIT CIM - HARBOUR

ACCEPTANCE TRIAL

TEST EQUIPMENT

1. The following test equipment is required:-

(a)	Signal Generator	6625-99-543-5163
(b)	Signal Generator	6625-99-541-9092
(c)	50 ohm 20 dB Pad	5905-99-580-0510
(d)	50 to 75 ohm matching pad	5905-99-580-0511
(e)	Voltmeter Set (True RMS)	6625-99-543-9894
(f)	Multimeter Model	6625-99-943-1524
(g)	Frequency Counter	6625-99-767-6349
(h)	Resistor 220 ohm $\frac{1}{8}$ watt	(Composition or Metal Oxide)
(j)	Headset	AP0558/198307

ANTI-CONDENSATION HEATERS AND INDICATORS

2. Put the MAINS ON/ANTI-CONDENSATION HEATERS changeover switch to ANTI-CONDENSATION HEATERS. Check that the anti-condensation heater in the cabinet is working and that the associated indicator lamp is lit.

MAINS SUPPLY INDICATION

3. Put the MAINS ON/ANTI-CONDENSATION HEATERS changeover switch to MAINS ON. Check that the ANTI-CONDENSATION HEATERS lamp is extinguished and the MAINS SUPPLY lamp on the cabinet is lit.

SWITCHING ON, TUNING AND CHECK OF OPERATING LAMPS

4. Put the supply switch on the Receiver, Radio Frequency to ON. Check that the SUPPLY lamp on the Receiver and the dial lamps on the Synthesizer are lit and that the TUNING and CUT OUT lamps light for approximately one second. Check also that the appropriate channel ON lamp is lit when any mode of reception is selected by the USB/DSB or LSB system switch, but that the LSB channel ON lamp is extinguished in any mode when the USB system switch is at DSB or MCW. Check that the Receiver automatically follows any change in the Synthesizer frequency, indicated by the TUNING lamp on the Receiver.

SYNTHESIZER

5. Carry out the procedure in BR 4146, Part 5B Chapter 1 Paragraphs 5 and 6 and 12(1) to 12(7)

RECEIVER OVERLOAD PROTECTION UNIT

6.(1) Apply +30 V (which can be taken from PLE5 when the Amplifier, Audio Frequency is connected via the extension panel) to 2 TP1 (adjacent to PLAL) to cause the Overload Protection Unit to operate. Verify that the audio output disappears and that the CUT OUT lamp lights. Set the METERING switch to position 17 (AGC-LSB) and verify that the meter reading is approximately 65. Remove the +30 V from 2 TP1 and verify that conditions remain unchanged.

(2) Switch off the Receiver, wait a few seconds and switch it on again. Verify that the audio output returns, that the CUTOUT lamp is extinguished and that only a small AGC voltage is present as set by the r.f. gain.

RECEIVER METERING CHECKS

7. Check the meter readings for each position of the METERING switch and record the results on the Metering Test Record Sheet.

SIGNAL-TO-NOISE RATIO AND SENSITIVITY CHECKS

8. Carry out the tests in BR 4147 Volume 2, Section 5C, Chapter 1, Paragraphs 64 to 65 inclusive as amended by the following instructions:-

(1) Equipment Required

Description	Commercial Type No.	CT No.	NATO Stock No.
Signal Generator			6625-99-541-9092
Matching pad	TM6599	-	5905-99-580-0511
Attenuator pad	TM5573	-	5905-99-580-0510
Voltmeter Set (True RMS)	-		6625-99-543-9894
220 ohm Resistor 1/8 watt (composition or metal oxide)	-	-	-

(2) Reference BR 4147 Volume 2, Part 5C, Chapter 1, Paragraph 64(3). Care must be taken to set the signal generator attenuators to give a total of +20 dB. This ensures an effective aerial EMF, of 1 μV, ie a potential difference of ½ μV actually across the matched aerial.

(3) Reference BR 4147 Volume 2, Part 5C, Chapter 1, Paragraph 64(4), connect a 220Ω resistor and the voltmeter across the LOC line O/P. (The line output level of 1.45 V into 220 ohms is the factory production figure and may not be achieved in practice. An output level of greater than 1.2 volts into 220 ohms for ½ μV p.d. at the aerial should always be achieved.)

(4) Reference BR 4147 Volume 2, Part 5C, Chapter 1, Paragraph 61(4), second sentence and onwards. Set up Voltmeter as detailed in 3 above. Reduce the gain so that the line output level reads -5 dB. This should ensure that the signal is below the AGC threshold. Switch tc "CARRIER OFF" position on the Signal Generator and increase the sensitivity of the Voltmeter until the noise level is indicated. (Each reduction of "RMS VOLTAGE RANGE" switch on the Voltmeter is equal to -10 dB.) Note the total noise level reading in dBs and subtract 5 dBs from it to obtain the "SIGNAL TO NOISE" ratio. The "SIGNAL TO NOISE" ratio figure quoted in BR4147(2), Section 5C, Paragraphs (4) to (17) are factory achieved performance. In practice they should not be allowed to deteriorate by more than 4 dB below the specifiied figure.

(5) The receiver has built-in ALC and it is possible that the above test may give poor "SIGNAL TO NOISE" ratio figures which are the result of poor sensitivity and do not necessarily imply a separate defect. In this case "SIGNAL TO NOISE" ratio figures should be taken with the r.f. gain control set to give an output, on the Voltmeter, which is 2 dBs below the reading obtained for the sensitivity check.

(6) Record results on "SIGNAL TO NOISE" ratio record sheet.

REMOTE LINE SENSITIVITY CHECKS

9. Proceed as follows:-

(1) Repeat Para 8(2) and (3) for REM1 and REM2 positions of USB output switch but on 12 MHz only. To obtain REM1 and REM2 outputs connect the voltmeter to points PLE31, 32 and PLE16, 27 respectively.

(2) Record results on test record sheet.

RECEIVER FREQUENCY CHECK

10. Check the Frequency Synthesizer of a TDC available for test purposes. (As detailed in the TDC Setting-to-Work.) At the Panel, Signal Distribution, Radio connect the Drive Unit to be used for testing to the TUNED FILTER position. Proceed as follows:-

(1) On the test Drive Unit select a frequency of 1.111 MHz. Set USB to LOCAL-CW, LSB to OFF and DRIVE ATTENUATOR to 30 dB.

(2) At the Aerial Exchange EZ ensure a Filter is housed in the Tuning Bay.

(3) Set all Receivers that are available to testing to the following conditions. AERIAL SELECTOR switch to position 4, LSB OFF, USB to CW REM. 1, R.F. GAIN to 0 dB, FINE TUNING control to 0 and select 1.111 MHz at the Synthesizer Dials.

(4) At the Filter Tuning Unit set the ATTENUATOR to 10 dB and a Receiver switch to the first Receiver to be tested. Connect a frequency counter via a jack plug to the appropriate AUDIO OUTPUT MONITOR jack socket.

(5) PRESS the TUNE switch of the test TDC and insert a shorted jack plug in the KEY socket. The Counter should READ 1000 Hz ± 2 Hz.

(6) Set the Receiver FINE TUNING control to -50 Hz, then +50 Hz the Counter should read 1050 ± 7 Hz and 950 ± 7 Hz respectively. Reset the FINE TUNING control to 0.

(7) At the Filter Tuning Unit select the second receiver to be tested. Check as in (5) and (6). Subsequently select each receiver and test it.

(8) At the TDC synthesizer and all CJM synthesizers under test, dial the following frequencies.

(9) Select each receiver in turn at the Filter Tuning Unit for each of the frequencies and test as described in (5).

2.2222 MHz
3.3333 MHz
↓
9.9999 MHz
10.0000 MHz
11.0000 MHz
↓
27.0000 MHz

NOTE: If a TDC is not available this check can be carried out by the reception of a signal from any standard derived source.

(10) Restore all Receivers and the Drive Unit to normal working.

RECEIVER MUTING

11. Link up a Transmitter to the receiver being checked via Receiver Output Exchange, TCU and CCX. Put 'MUTE' switch to 'ON'. Select CW on USB panel of Receiver and switch on. Select CW on USB panel of Transmitter Drive Unit and switch on. Check that when the transmitter is keyed the Receiver is muted. Receiver muting can be checked aurally and also by the Receiver meter, which, on METERING positions 16 and 17 should read between 80 and 100 when muting. If the CUT OUT lamp lights when key is pressed check that it is extinguished when key is released.

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SHIP _____

DATE _____

UNIT	SERIAL NO
CABINET	
RECEIVER	
SYNTHESIZER	

RECEIVER METERING TEST RECORD

Receiver Condition: SYNTHESIZER set to any frequency except as stated in the remarks column. SQUELCH switched OFF. USB/DSB and LSB system switches OFF. R.F. GAIN maximum (fully clockwise).

Para. 7.

METERING SWITCH			NORMAL READING	READING OBTAINED	REMARKS
POSN	TITLE				
1	1 MHz		35–100		
2	RANGE	(1)	10 ± 3		0.240 0.525 MHz
		(2)	20 ± 3		1.0 1.99 MHz
		(3)	30 ± 3		2.0 3.9 MHz
		(4)	40 ± 3		4.0 7.9 MHz
		(5)	50 ± 3		8.0 15.9 MHz
		(6)	60 ± 3		16.0 27.9 MHz
3	SUPPLIES	+230 V	36–44		
4		+30 V	56–64		
5		-30 V	56–64		
6	1 K1 + 2		49–69		
7	FROM SYNTH	37.5 MHz	> 2		
8		VAR. OSC	> 2		
9		2.3 MHz	> 8		
10	FREQ CH DRIVES	1ST OSC.	> 2		/Varies with freq
11/			50–80)		(above 8 MHz
		3 MHz	0)		(below 8 MHz
12		1.1 MHz	45–85		
13		100 kHz	55–85		
14	AGC DET	USB	< 10		
15		LSB	< 10		
16	AGC	USB	2–6		
17		LSB	2–6		
*18	I.F. TEST ON DSB	4 MHz	< 10		below 8 MHz
			60 approx		above 8 MHz
*19		1 MHz	60 approx		below 8 MHz
*20		100 kHz	60 approx		

* On positions 18, 19 and 20 set the USB/DSB system switch to DSB and the R.F. GAIN to 20 dB. (Aerial Disconnected).

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SHIP _____

DATE _____

UNIT	SERIAL NO.
CABINET	
RECEIVER	
SYNTHESIZER	

RECEIVER SIGNAL TO NOISE RATIO RECORD

Para 8

FREQUENCY (MHz)	SIGNAL TO NOISE (dB)	SENSITIVITY (VOLTS)
0.245		
0.300		
0.525		
1.050		
1.500		
1.900		
2.000		
3.000		
3.900		
4.000		
6.000		
7.900		
8.000		
12.000		
15.900		
16.000		
22.000		
27.900		
2.500		
2.500		
2.500		
2.500		
2.500		
2.500		
2.500		

SHIP _____

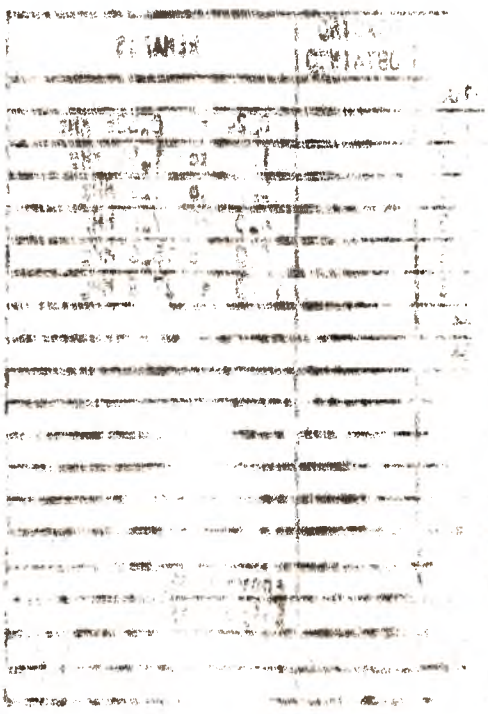
DATE _____

UNIT	SERIAL NO
CABINET	
RECEIVER	
SYNTHESIZER	

REMOTE LINES SENSITIVITY RECORD

Para. 9

USB OUTPUT SWITCH POSITION	READING OBTAINED
REM1	
REM2	



WEAPON EQUIPMENT PERFORMANCE RECORD SHEET

RECEIVER OUTFIT CJM

ESTABLISHED DEC 71

H.M.S. .....

REVISED NOV 75

REFERENCE BR 4144(6) Pt 8 Chap 2.....	ITEM NO	CHECK AND/OR RECORD
Para 2	1	Operation of anti-condensation heaters and their indication lamps. ☐
Para 3	2	Mains supply indication. ☐
Para 4(1)	3	Tuning and check of operating lamps and time delays. NOTE: Fan only fitted when associated with Type 641. ☐
		Appropriate channel 'ON' lamp when reception selected by USB/DSB or LSB switch. ☐
		LSB channel 'ON' extinguished on any mode when USB system switch to DSB or MCW.
		Receiver automatically follows changes in synthesizer frequency. ☐
Para 5	4	Receiver overload protection unit. ☐
Para 6	5	Receiver Radio Frequency 5820-99-519-7019 Receiver Condition Synthesizer set to 300 KHz except as noted in remarks column. Squelch, USB/LSB and DSB system switches to off, r.f. gain maximum (fully clockwise). Front Panel Meter Readings

METERING SWITCH POSN	METERING SWITCH TITLE		NORMAL READING	READING OBTAINED	REMARKS
1	1 MHz		35-100		
2	RANGE	1	10 ± 3		0.24 to 0.525 MHz
		2	20 ± 3		1.0 to 1.99 MHz
		3	30 ± 3		2.0 to 3.9 MHz
		4	40 ± 3		4.0 to 7.9 MHz
		5	50 ± 3		8.0 to 15.9 MHz
		6	60 ± 3		16.0 to 27.9 MHz
3	SUPPLIES	+230 V	36-44		
4		+30 V	56-64		
5		-30 V	56-64		
6	1 K1 + 2		49-69		
7	FROM SYN	37.5 MHz	> 2		
8		Var Osc	> 2		
9		2.3 MHz	> 8		
10	FREQ CHAN DRIVES	1st Osc	> 2		
11		3 MHz	50-80		Above 8 MHz
			0		Below 8 MHz
12		1.1 MHz	45-85		
13		100 kHz	55-85		

REFERENCE BR 4144(6)Pt.B Chap.2	ITEM No.	CHECK AND/OR RECORD

Front Panel Meter Readings (Contd)

METERING SWITCH POSN	METERING SWITCH TITLE		NORMAL READING	READING OBTAINED	REMARKS
14	AGC DET	USB	< 10		
15		LSB	< 10		
16	AGC	USB	2-6		
17		LSB	2-6		
*18	IF TEST ON DSB	4 MHz	< 10		Below 8 MHz
			55		Above 8 MHz
*19		1 MHz	< 10		Above 8 MHz
			55		Below 8 MHz
*20		100 kHz	55		

√ Varies with frequency.
* On Positions 18, 19 and 20 set the USB/DSB system switch to DSB and R.F. gain to 20 ± 10 dB. (Aerial disconnected.)

Para 7 — 6 — Signal to Noise Ratio and Sensitivity

BAND	FREQUENCY MHz	S/N RATIO NORMAL ≥ 0.30V NOTE 3	SENSITIVITY CJM > 1.45V (NORMAL)CJM WITH TYPE 641 > 1.2V, NOTE 4
1	0.245		
	0.300		
	0.525		
2	1.050		
	1.500		
	1.900		
3	2.000		
	3.000		
	3.900		
4	4.000		
	6.000		
	7.900		
5	8.000		
	12.000		
	15.900		
6	16.000		
	22.000		
	27.900		

2.5 MHz	USB SSB	≥ 0.30V		> 1.45V
2.5 MHz	USB FST	≥ 0.24V		> 1.45V
2.5 MHz	USB CW	≥ 0.30V		> 1.45V
2.5 MHz	LSB SSB	≥ 0.30V		> 1.45V
2.5 MHz	LSB DATA	≥ 0.30V		> 1.45V
2.5 MHz	USB DSB	≥ 0.175V		> 0.70V
2.5 MHz	USB MCW	≥ 0.1V		> 0.44V

NOTES:

1. S/N reference datum level
   1.2V
   0.7V FOR DSB
   0.4V FOR MCW

2. 35% MOD on 1kHz for USB DSB and MCW CHECKS.

3. Factory performance figure, may be degraded in use as follows: 0.30V to 0.52V, 0.24V to 0.38V.

4. 1.45V is a factory performance figure, in use 1.2V is acceptable.

REFERENCE BR 4144(6) Pt B Chap 2	ITEM NO	CHECK AND/OR RECORD
	7	Check Muting when transmitter is available.
		ACCEPTANCE AUTHORITY ..... SIGNED ..... DATE ..... SETTING TO WORK AUTHORITY ..... SIGNED ..... DATE .....