HANDBOOK No. Z1/ZAA0330

(A.W.A. No. 51061R)

PROVISIONAL ISSUE

RECEPTION SET No. 8C (AUST.)

(A.W.A. TYPE C51061)

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The information contained
in this Handbook has been
compiled and produced by:-

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Reception Set No. 8C

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CHAPTER I. GENERAL DESCRIPTION

1. APPLICATION

The RECEPTION SET NO. 8C (Aust.) is a nine-valve, high-gain superheterodyne used as part of WIRELESS SET NO. 153. It is a modification of the RECEPTION SET Model AMR100 and is designed especially for service under adverse conditions of temperature, humidity and mechanical vibration.

This Provisional Instruction Book describes the RECEPTION SET only, which is referred to throughout the text as Rec. 8C. This Instruction Book will be replaced later by SIGNAL TRAINING, VOL.III, AUST. PAMPHLET NO.....

For the use of the RECEPTION SET NO. 8C (Aust.) in conjunction with WIRELESS SET NO. 153 refer to Handbook No. Z1/ZAA0309 and later to SIGNAL TRAINING, VOL. III, AUST. PAMPHLET NO.....

2. ELECTRICAL CHARACTERISTICS

2.1 Types of Emission Receivable

Rec. 8C will receive the following types of emission:-

(a) C-W Wireless Telegraphy (W/T)

(b) C-W Wireless Telegraphy (W/T) having frequency modulation with a small modulation index.

(c) Tone or M-C-W Wireless Telegraphy (W/T)

(d) Speech (R/T)

2.2 Frequency Coverage

The frequency coverage of the Rec. 8C is continuous from 1.85 to 26 Mc in four bands employing plug-in coil units. The frequency coverages of the different bands are:-

Band A: 14.3 to 26 Mc

Band B: 7.0 to 14.6 Mc

Band C: 3.6 to 7.3 Mc

Band D: 1.85to 3.9 Mc

The intermediate frequency is 455 Kc.

Narrow-band reception of C-W is provided by a crystal filter unit incorporated in the I-F amplifier, the selectivity being variable by means of a front panel control having sufficient range for speech reception. There is also a phasing control on this filter circuit to allow elimination of interfering signals.

2.3 Power Supply

Rec. 8C can operate from a-c supplies of either 220V ± 10% 50-60 cycles or 110V ± 10%, 50-60 cycles, and also from a 12V battery by means of an incorporated non-synchronous vibrator. In the normal arrangement, the a-c supply of either voltage is obtained from the WIRELESS SET NO. 153.

The input voltage selector switch and the on-off switch are mechanically interlocked so that the equipment cannot be changed over to one of the alternative power supplies unless it is first switched off.

SECTION 2 (Contd.)

The approximate input from 110V or 220V supply is 70 watts. When the 12V battery is used, the drain is approximately 5.5 amperes.

2.4 Sensitivity

The sensitivity of the reception set for inputs applied to the various stages is given in TABLE I for 50 mW output.

2.5 Output Circuits

Two output jacks are fitted, each of which gives a 600 ohm connection for either headphones (receiver, headgear, C.L.R. double MK.3 (Aust.) or a line.

There is also a third jack outlet through which the RECEPTION SET may be muted via a relay in the WIRELESS REMOTE CONTROL UNIT, H (Aust.) No.1 or No.2 used in conjunction with WIRELESS SET NO.153. When the plug is withdrawn from this jack, the contacts of the latter close and the RECEPTION SET is then automatically unmuted so that it may be operated as a separate unit.

2.6 Monitor Speaker

A monitor speaker is incorporated in the RECEPTION SET and can be switched off when not required.

2.7 Valve Complement

The following valves and vibrator are used:-

4 each type 6U7G

1 each type 6J8G

2 each type 6J5GT

1 each type 6G8G

1 each type 6V6GT

2 each type 6X5GT

1 each vibrator 12V, type V5123

3. MECHANICAL CONSTRUCTION

3.1 GENERAL

REC. 8C consists of a reception set and a power supply built on a common chassis framework with front panel attached. It is sealed in a one-piece ribbed aluminium-alloy case by screwing the front panel up against a soft rubber gasket. A detachable front cover, also of ribbed aluminium alloy, is secured to the front of the case against a rubber gasket by a number of substantial clamps. A canvas flap, carried inside the cover, may be clipped to the front of the case when the cover is removed.

With the cover in place the complete case is immersion-proof, and protects the equipment during transit. With the cover removed and the canvas flap in place, the units is shower-proof and splash-proof.

Each control knob on the panel is backed by a cup which renders the shaft bushing splash-proof. The monitor loudspeaker is mounted behind a grille punched integral with the front panel, and a sheet of poly-vinylchloride between the grille and loudspeaker protects the cone material from water, dust, etc.,

Inside the removable front cover is a plate bearing a circuit diagram and a list of the components used in the RECEPTION SET.

The whole unit is shock-mounted in a tubular framework which clamps beneath frameworks of similar general construction forming part of, and acting as a trestle for, two of the main units of the SENDER of WIRELESS SET NO. 153.

Valves are held in place either by base clamps or by shielding cans which have spring-loaded clips. The two vibrators (working and spare) are secured by stirrup clamps.

3.2 Weights and Dimensions

The weight and dimensions of RECEPTION SET NO. 8C, including the carrying frame are given below:-

	Weight	Height	Breadth	Depth
REC. 8C with carrying frame	101 lb.	15 in.	31.1/2in.	18.1/4in.

CHAPTER II. INSTALLATION

4. LOCATION

The REC. 8C located at the No.1 or local position, is secured to the trestle supporting two units of the SENDER. The REC. 8C at the No.2 or remote position is placed on some convenient support, the carrying frame providing insulation against vibration.

5. CONNECTIONS

5.1 POWER SUPPLY

The REC. 8C located at the SENDER of WS153 receives its 110V or 220V a-c supply from the POWER CONTROL AND MINOR RECTIFIER UNIT via CONNECTOR, 3 PT. (AUST.) No. A6 which is plugged into the appropriate receptacles as marked on the two units.

The REC. 8C located at the remote position is connected to the 110-volt or 220-volt a-c supply, if available, by means of CONNECTOR, 3PT. (Aust.) No. A8. If a-c supply is not available at this point, then battery supply must be used. A 12-volt battery is connected by CONNECTOR, 3 PT (Aust.) No. A9, which is plugged into the 3-pin triangular receptacle designated D.C. INPUT.

5.2 Other Connections

(i) The aerial and earth are NOT connected directly to the REC. 8C. Instead, they are connected to the "AER" and "E" terminals on the WIRELESS REMOTE CONTROL UNIT H (Aust.) No. 1 for the RECEPTION SET adjacent to the SENDER, and to similar terminals on the WIRELESS REMOTE CONTROL UNIT H (Aust.) No. 2 for the one at the remote position. In both cases, the "AER" and "E" terminals on these Control Units are connected, in addition, to the "AER" and "E" terminals on the RECEPTION SET via CONNECTOR, TWIN (Aust.) No. 15. The spade lugs of this Connector are clamped under the corresponding "AER" and "E" terminals of the Control Units, whilst the shaped sockets at the other end are secured behind the captive AERIAL and EARTH terminals on the RECEPTION SET.

(ii) The output and the muting circuit of the RECEPTION SET are connected to the WIRELESS REMOTE CONTROL UNIT H (Aust.) No. 1 or No. 2, as the case may be, by CONNECTOR, 4PT (Aust.) No. A5. This Connector has at one end a 4-pin socket which plugs into the corresponding receptacle on the Control Unit. The other end of the cable terminates in two single-circuit plugs which are inserted, respectively, as marked, into the 600 Ω LINE JACK and MUTING JACK on the RECEPTION SET.

(iii) A metallic earth spike should be driven 5 to 8 ft. into the ground adjacent to the equipment and a short lead of 7/22 insulated cable run directly to the vacant earth terminal on the Control Unit. This earth spike may be common to the other Units of the WIRELESS SET.

(iv) If required, an additional pair of low-resistance phones may be plugged into the available 600 Ω LINE JACK on the RECEPTION SET front panel.

SECTION 5 (Contd.)

5.3 Adjustment for Power Supply

According to the power supply in use, the POWER SELECTOR switch must be turned to the appropriate position: 220V. A.C., 110V. A.C. or 12V. D.C. No internal alteration to connections is required, provided the correct Connector is plugged into the receptacle.

Note that the POWER SELECTOR switch cannot be moved unless the main ON-OFF switch above it is at OFF.

CHAPTER III. OPERATING INSTRUCTIONS

6. SUMMARY OF CONTROLS AND THEIR FUNCTIONS

6.1 General

The operation of the RECEPTION SET presents no difficulty when the functions of the various controls are understood. Four plug-in coil units are carried, each being clearly marked with the frequency band that it covers. Each coil unit also bears a calibration curve showing dial reading horizontally and corresponding frequency vertically.

6.2 Tuning dial

This is located in the centre of the front panel. As the dial is turned, at each 1/5 of the full revolution a number will be seen in a window opposite the pointer. These numbers are from 0 to 500 in tens and the dial is also calibrated in units between each window so that readings may be made to one part in 500.

To set the RECEPTION SET to a required frequency, the appropriate coil unit is first selected and plugged-in, and then from its calibration curve the dial reading corresponding to the required frequency is obtained. The dial is then set to this reading.

6.3 SELECTIVITY control

The uppermost knob just to the right of the Tuning dial is the variable selectivity control of the single-signal crystal filter. When this crystal filter is in use (see CRYSTAL switch), minimum selectivity is obtained with the pointer at MIN. Turning the knob clockwise from this point will increase the selectivity.

6.4 CRYSTAL switch

This control is below and slightly to the left of the SELECTIVITY control. The crystal filter is in operation in the IN position of the control and is shorted in the OUT position.

6.5 PHASING control

This is located directly below the selectivity control. When the pointer is set to correspond to the centre bar, the crystal filter is centrally phased. For the elimination of interfering heterodyne signals, etc., the control is adjusted to a suitable

SECTION 6 (Contd.)

position on either side of this setting. The control is calibrated for record purposes.

6.6 Facility Switch

This is the four-position switch at the bottom right-hand corner of the panel. Reading clockwise the positions are:-

(i) H.T. OFF,

(ii) A.V.C. ON,

(iii) A.V.C. OFF,

(iv) B.F.O. ON.

In position (i) the high tension supply is disconnected, but the valve heaters remain energised. This position is used when "standing-by" during breaks in traffic, or when changing coils. In position (ii) the high tension is connected and also the automatic volume control line so that the RECEPTION SET operates normally, the output being automatically regulated by the strength of the received carrier. This position may be used for the reception of speech, or MCW signals where the tone only is keyed.

Position (iii) retains the high tension switched on but renders the automatic volume control circuit inoperative. This position may be used for MCW signals where both the carrier and the tone are keyed simultaneously.

Position (iv) switches on the Beat Frequency Oscillator and still keeps the a-v-c circuit inoperative. This position is suitable for the reception of C-W signals. It may also be used to locate a weak phone carrier, after which a return is made to position (ii).

6.7 B.F.O. CONTROL

This is situated at the left-hand lower corner of the panel, and, when the FACILITY switch is at B.F.O. ON, adjusts the heterodyne note obtainable between zero and 2,000 cycles clockwise and anti-clockwise from the centre bar. The control is calibrated for record purposes.

6.8 R.F. GAIN Control

This control lies just to the right of the tuning dial and

SECTION 6 (Contd.)

controls the r-f sensitivity by varying the grid bias applied to the 2nd radio frequency and intermediate frequency amplifying valves. This control is also calibrated.

6.9 A.F. GAIN Control

Situated directly above the B.F.O. CONTROL, the A.F. GAIN control is calibrated for record purposes, and regulates the output from the loudspeaker or headphones by varying the audio input to the grid of the first audio frequency amplifier.

6.10 AERIAL TRIMMER

This allows the aerial to be matched to the input circuit of the RECEPTION SET. It is to the left of the tuning dial and should be adjusted for maximum sensitivity after tuning the former. The control is calibrated and the rotation over 180° is limited by stops in both directions.

7. TUNING

7.1 Changing Coils

When changing coils it is essential to turn the Facility switch to the H.T. OFF position. This will eliminate the possibility of short-circuiting the high tension during the operation.

7.2 Speech Reception Without Crystal Filter

(i) Set the CRYSTAL switch at OUT.

(ii) Set the SELECTIVITY control at MIN.

(iii) Set the B.F.O. CONTROL at the centre of the bar marked on the panel.

(iv) Set the Facility switch at A.V.C. ON or A.V.C. OFF as desired.

If A.V.C. is used, the R-F GAIN control may be advanced fully clockwise to "O" and the volume controlled by the A-F GAIN control.

If A.V.C. is not used, the A.F. GAIN control may be set in the maximum position (clockwise) and the sensitivity regulated by the R-F GAIN control. If there is not sufficient range available on this control for handling a very strong signal, further reduction may be made by the A-F GAIN control. The use of these gain controls is largely to be determined by the operator, having regard to the reception conditions prevailing.

NOTE 1: The Facility switch may be set to the B.F.O. ON position to assist in locating a weak speech carrier, the B.F.O. CONTROL being set to the zero position. After tuning the RECEPTION SET to zero beat with the carrier by means of the Tuning dial, the Facility switch is then returned to the A.V.C. ON or A.V.C. OFF positions as described and the AERIAL TRIMMER is tuned for maximum response. The Gain Controls are then adjusted for the desired output.

7.3 Speech Reception with Crystal Filter

The use of the crystal filter for receiving speech or C.W. is recommended when adverse conditions of noise, static, heterodynes, etc. are present.

(i) Set the CRYSTAL switch to IN,

(ii) Set the SELECTIVITY control to MIN.,

SECTION 7 (Contd.)

(iii) Set the PHASING control to the square dot.

(iv) Set the B.F.O. CONTROL to the centre of the bar marked on the panel.

The Facility switch, B.F.O. CONTROL and AERIAL TRIMMER are employed as in sub-section 7.2.

The principal advantage of the crystal filter is its ability to eliminate heterodynes. These may occur from an interfering station after a signal has been tuned-in, and would ordinarily render the speech unintelligible. Careful adjustment of the SELECTIVITY and/or PHASING controls will in most cases completely eliminate the interfering station and the heterodyne. The PHASING control can eliminate only one signal at a time, but even if an additional interfering station comes on, there will then be only one heterodyne to contend with instead of the several which would result from interaction between three carriers.

7.4 C.W. Reception without Crystal Filter

(i) Set the CRYSTAL switch at OUT,

(ii) Set the Facility switch to B.F.O. ON,

(iii) Set the B.F.O. CONTROL to the centre of the bar marked on the panel.

As the A.V.C. will be inoperative, the A.F. GAIN control may be advanced to maximum and sensitivity controlled by the R-F GAIN control unless the signal is very strong, whereupon the A-F GAIN may need to be reduced.

First adjust the Tuning dial for zero beat with the signal, then vary the B.F.O. CONTROL to obtain a convenient beat note, about 500-1000 cycles being usual.

7.5 C.W. Reception with Crystal Filter

(i) Set the CRYSTAL switch to IN,

(ii) Set the SELECTIVITY control to MIN.,

(iii) Set the PHASING control to the square dot,

(iv) Set the B.F.O. CONTROL to the centre of the bar on the panel.

SECTION 7 (Contd.)

(v) Set the Facility switch at B.F.O. ON.

Tune the RECEPTION SET to zero beat with the signal as set out in 7.3, then set the SELECTIVITY control to MAX. Now, as the RECEPTION SET is tuned slowly across the carrier, the beat note will be sharply peaked at one point. At all other points the beat note will be weak, and, furthermore, this peak will occur only to one side of the carrier. If a heterodyne is present in addition, it can be eliminated or greatly reduced by adjusting the PHASING control either side of the square dot, as required.

CHAPTER IV. TECHNICAL DESCRIPTION

8. SYNOPSIS OF CIRCUIT ARRANGEMENT

RECEPTION SET NO. 8C (Aust.) comprises a nine valve, 4 band superhetorodyne and a built-in power supply section for operation from 110-volt or 220-volt a-c or from 12-volt d-c. The intermediate frequency is 455 Kc, the local oscillator frequency being higher than the signal frequency. Two r-f and two i-f amplifier stages are used, followed by a diode second-detector/a-f driver, and an output valve. A separate local oscillator valve is used in conjunction with a mixer valve, while another local oscillator valve is provided for heterodyne reception of c-w signals. A crystal filter for increased selectivity is incorporated in the i-f amplifier and may be cut out when not required.

The frequency coverages of the four bands have already been quoted in paragraph 2.2.

9. STAGE BY STAGE DESCRIPTION (Refer Fig. 1.)

9.1 R.F. Amplifiers (Refer Fig. 1)

The following remarks apply specifically to Band A. The arrangement of the other bands is basically similar, minor variations being necessitated by the frequency ranges. The circuits of the coil box for Band A (the highest frequency band) and for Bands B to D are shown at the top of the diagram, the circuit reference numbers of the transformers being listed for each band. The same course is followed with those capacitors and resistors which have different values on different bands.

The aerial is inductively coupled to the grid of V1A by transformer T1A, the secondary of which is tuned by C14A/1, one section of the 4-gang main tuning capacitor. The circuit is trimmed by the AERIAL TRIMMER C15A to allow various types of aerial to be employed.

The anode of V1A is coupled to the grid of the 2nd i-f amplifier V1B by transformer T2A.

Capacitor C2A introduces a small amount of "top capacity" coupling at the high frequency end of the band. The secondary of T2A is tuned by C14A/2, another section of the main tuning gang, in association with fixed capacitor C4A, and an adjustable trimmer C3A.

The anode of V1B is coupled by T2B to the signal grid of the heptode section of the converter valve V2A. This transformer is similar to T2A and the secondary is tuned by C14A/3, the third section of the main gang, in conjunction with C4B and adjustable trimmer C3B. Capacitor C2B provides top-capacity coupling as before.

On Band A, a series padding capacitor is used with the main tuning gang in each stage to give a slight bandspread effect, which facilitates tuning at the high frequency end of the band. These "padders" are C1A, C1B, C1C for T1A, T2A and T2B respectively. Magnetite cores are fitted to transformers T2A, T2B and T3A to permit alignment of the ganged circuits at the low frequency end of Band A.

In Bands C and D, resistors R2A, R2B, and R3A, R3B, respectively, are shunted across the primary winding of T10A, T10B and T11A, T11B to equalise the sensitivities of the various bands and thereby the relative setting of the R.F. GAIN control.

Valves V1A and V1B are self-biassed by cathode resistors R7A and R7B, by-passed by C17A and C17C respectively. The grid returns

SECTION 9 (Contd.)

are connected to the a-v-c line by R6A and R6B, with decoupling capacitors C16A and C16B respectively. In addition to the self-bias, V1B receives a variable bias from the R-F GAIN control R9A, which forms part of a potential-dividing network across the high-tension supply, and functions by varying the positive potential of the cathode relative to ground. From the upper part of this potential divider, at the junction of R10B, R10C, R10D with R5B, R5C, the screen potential is obtained for V1A, B, C and D.

9.2 Frequency Converter

The frequency converter valve V2A is a triode-heptode type, the triode section, however, not being used as such. The triode grid merely serves as a means of connecting to the heptode injection grid, which is an extension of the triode grid inside the valve. The triode anode is rendered inoperative by connecting it to its own cathode.

The voltage at local-oscillator frequency is applied via capacitor C30A to the triode grid and thence to the heptode injection grid. The voltage at signal frequency from V1B is applied to the heptode signal grid from the secondary of T2B. The heptode anode is connected by T19A to the grid circuit of the first i-f amplifier via the crystal filter X1A. T19A is tuned to the intermediate frequency of 455 Kc.

The anode circuit of V2A is decoupled by R8C and C19C. Self-bias is obtained from R7C by-passed by C17D, and the screen-grid voltage is reduced from the maximum supply value by R11A by-passed by C17P.

9.3 Local Oscillator

The local oscillator V5A is a triode operating in a tuned-anode feed-back circuit at a frequency 455 Kc higher than signal frequency. The tuned circuit consists of transformer T3A, the grid winding being untuned, and the anode winding tuned by C14A/4, the fourth section of the main tuning gang. C6A in parallel with C7A forms the series padding capacitance. Across the anode winding is an adjustable trimmer capacitor C3C and a fixed capacitor C31A which, in conjunction with the magnetite core, enable the circuit to be tracked with the signal circuits.

Capacitance C31A (located across the coil box contacts on the chassis proper) is a negative temperature-coefficient type used to minimise frequency drift due to temperature variations, and functions for all bands.

SECTION 9 (Contd.)

The anode circuit of V5A is decoupled by resistor R1A and capacitor C5A whilst operating grid bias is obtained from the grid resistor R4B and the grid coupling capacitor C32A.

9.4 Crystal Filter Unit

The high-impedance primary of T19A forms the load for the heptode section of V2A and is tuned by a fixed capacitor C33A and an adjustable magnetite core. The secondary of T19A is of relatively low impedance, and is centre-tapped to earth to provide a voltage through C35A out of phase with the voltage through the crystal X1A. C35A is the PHASING control employed to neutralise the capacity of the crystal holder, and also to shift the phasing of the circuit for elimination of heterodynes. In parallel with C35A is a trimmer capacitor C34A which enables exact neutralisation to be obtained with C35A set at the square dot on the front panel scale.

The output of the crystal is fed to the grid of the first i-f amplifier valve V1C via C32B and the i-f inductor L1A, the grid being tapped down the winding of L1A. This inductor is tuned by means of a fixed capacitor C33B, a variable capacitor C36A (SELECTIVITY control) and an adjustable magnetite core. The function of C36A is to enable varying degrees of selectivity to be obtained when using the crystal. For broad bandwidth or minimum selectivity the control is set to the minimum capacitance position, which tunes the circuit to exactly the same frequency as the crystal. As the capacitance is increased, so also is the selectivity. The adjustable magnetite core tunes the circuit to exact crystal frequency with the SELECTIVITY control set at the appropriate position (MIN.) on the panel.

The crystal may be shorted out by placing the crystal switch S4A in the OUT position, in which case the PHASING control should be set to the square dot, and the SELECTIVITY to MIN., for normal operation.

9.5 I-F Amplifiers

The first i-f amplifier valve V1C is an r-f pentode. The input circuit has already been described in sub-section 9.4 above. The output from this valve is fed to the grid of the 2nd i-f amplifier valve V1D via the i-f transformer T20A, the primary and secondary of which are tuned by fixed capacitors C24A and C24B respectively, and by adjustable magnetite cores. Input to V1D is taken from a tap on the secondary of T20A to reduce the gain, and to minimise change in alignment when valves are replaced.

SECTION 9 (Contd.)

The same method of coupling is employed between V1D and the diodes of V3A, using an i-f transformer T21A which is tuned by fixed capacitors C24C and C24D and magnetite cores.

Both V1C and V1D are self-biased by, respectively, resistors R12A and R12B by-passed by C17E and C17F. In addition, a variable bias is provided by the R.F. GAIN control R9A for these two valves, as well as for the 2nd r-f amplifier V1B.

A-V-C bias is applied to the grid of V1C through R6C which, together with C16C, provides decoupling, and to the grid of V1D through R15D by-passed by C16D.

Decoupling of the two anode circuits is accomplished by R8D, C19E and R8E, C19F respectively. Screen-grid voltage is obtained from the same potential divider as that for V1A and V1B.

9.5.1 Muting

Normally, the lower end of the R.F. GAIN control (R9A) connects to earth via the closed contacts of the MUTING JACK J1C, so that the REC. 8C may be used independently of the WS153.

By inserting a plug in J1C this earth connection is opened and replaced by a high resistance, R27A, sufficient to bias valves V1B, C, and D to cut-off, thus muting the REC. 8C.

Shorting the remote end of the muting plug line will then restore the REC. 8C to normal operation.

9.6 Detector, AVC and A-F Stage

V3A is a duo-diode pentode, with one diode as the signal detector and the other as the A-V-C detector, while the pentode section is the a-f amplifier.

9.6.1 Signal Detector

The signal diode is fed directly from the secondary of T21A, the load for this diode being provided by resistors R6D and R13A. As well as forming part of the diode load, R6D acts as an i-f filter in conjunction with capacitors C37B and C37A.

The a-f component developed across R13A also appears across the variable potentiometer R16A (A.F. GAIN control)

SECTION 9 (Contd.)

which is in parallel with R13A through the coupling capacitor C21A. The control grid of the pentode section of V3A connects to the moving arm of R16A and thus the voltage applied to the grid is dependent upon the setting of the A.F. GAIN control.

9.6.2 A-V-C Detector

The a-v-c diode is connected through capacitor C38A to the signal diode. The a-v-c rectified voltage is developed across the load formed by the fixed potentiometer R15B and R15C. This voltage is proportional to the strength of the received carrier and is used to provide negative bias to the a-v-c system.

The full voltage is applied to the control grid of each of valves V1C, V1B and V1A through decoupling resistors R15E, R6C, R6B and R6A. Valve V1D obtains only portion of the voltage (through decoupling resistor R15D) as its grid connects to a point which is tapped down the potentiometer R15B, R15C.

As the bottom of this potentiometer connects to earth, a delay voltage is provided equal to the d-c volts developed across the cathode bias resistor R14A by the cathode current of V3A. No rectification takes place at the a-v-c diode until the strength of the incoming carrier is sufficient to overcome this bias, thus delaying the a-v-c action.

Note that both the a-v-c lines are earthed by the Facility Switch in the A.V.C. OFF and B.F.O. ON positions.

9.6.3 A-F Amplifier

The pentode section of V3A operates as an a-f amplifier. Resistor R18A forms the anode impedance, across which the a-f component is developed and applied to the control grid of the output valve V4A via coupling capacitor C21B. Decoupling of the anode circuit is by resistor R10E and capacitor C19G.

Screen-grid voltage is obtained from the junction of resistors R15A and R17A, which form a potential divider, and is by-passed by C17H. Self-bias is developed across resistor R14A, with C18B as the cathode by-pass capacitor.

SECTION 9 (Contd.)

9.7 Output Stage

The output valve V4A is a beam power amplifier. An output transformer T24A couples the anode of V4A to a low-impedance winding (3.7 Ω) for connection to the monitor loudspeaker voice coil. A switch S5A allows the speaker to be cut out when not required.

A second winding on transformer T24A, for 600 ohm circuits, has two jacks (J1A and J1B) wired in parallel across it. These are each designated on the front panel as 600 Ω LINE JACK, and either may be used for connecting to a 600 ohm line, or to a pair of low-resistance headphones.

Self-bias for V4A is obtained by resistor R20A, by-passed by C18C, while the screen-grid is connected directly to high tension. R22A and R21A are the grid leak and grid damper respectively.

Inverse feedback is provided by the connection of resistor R19A from the anode of V4A back to the anode of V3A. C22A provides high frequency tone compensation.

WARNING: Either the loudspeaker, line or phones MUST be connected before switching on the RECEPTION SET, otherwise damage to the output valve may result due to its operating in an unloaded condition.

9.8 Beat Frequency Oscillator

V5B is a triode and operates as an oscillator. A tuned circuit, consisting of capacitor C23A, transformer T22A, and blocking capacitor C24E, is adjusted to resonate at 455 Kc.

Coupling into the i-f channel to produce an audible beat frequency is through capacitors C2E, C2F in series, i.e., from the anode of V5B to the a-v-c diode of V3A.

The centre-tapped primary of T22A is closely coupled to the small secondary, across which is the variable resistor R26A (B.F.O. CONTROL). The transformer is initially tuned to 455 Kc, by means of its magnetite core, with R26A set at the central bar of the front panel scale. Variation of R26A either side of this setting alters the tuning of the oscillator circuit, and thereby the pitch of the beat note produced.

For reception of a signal with the beat oscillator "on", the B.F.O. CONTROL should be set to the central bar, thus ensuring that

SECTION 9 (Contd.)

when a carrier is tuned to zero beat, the RECEPTION SET is tuned to the centre of the carrier. Adjustment of the B.F.O. CONTROL will then produce a beat note of up to 2,000 cycles per second when moved either way from the central bar.

The anode of V5B is decoupled by resistor R10F and capacitor C19J, while C19H by-passes the h-t lead of the B.F.O. circuit. Bias is obtained by means of the grid-leak R10G.

9.9 Power Supply

The power supply is built into the front panel and main body of the RECEPTION SET, but all the components associated with it are mounted on a separate chassis which is insulated from the remainder of the unit. The earth connection for the power supply chassis is then made to one point only of the main body, by means of the braid on the shielded four-core cable carrying h-t and l-t supplies to the circuits described in the previous sections.

In the power supply itself, two valves (V6A and V6B) are employed in a full wave rectifier circuit, each valve having its pair of anodes bridged. The heaters are connected in series, and the cathodes in parallel.

The transformer T25A supplies the rectifier anodes and all the valve heaters, etc., when the input is from 110V or 220V, 50-60 cycle A.C. mains. T25A has three primary windings, two being 110V windings for A.C. inputs, while the third is for 12V D.C. input via the vibrator VIB1A. On 12V D.C., all valve heaters, etc., are supplied direct from the input source through switches S3A (ON-OFF) and S2A (POWER SELECTOR). The rectifier anodes are supplied with A.C. via the non-synchronous vibrator VIB1A when 12V D.C. input is used. Valve heaters V1A to V5B are connected in series-parallel as shown in Fig. 1, with the pilot lamp P1A and the external terminals marked LAMPS, OPERATOR included in the circuit.

Note the heater wiring arrangement of valves V3A and V5B. If either is removed while the heaters are switched on, the voltage across the other will rise, therefore the REC. SC should not be run in this condition for any length of time.

Transformer T25A has its h-t secondary centre tap (i.e. negative return) connected through the shielded cable to the Facility Switch S1A, Section 3, via a filter consisting of choke L2B and capacitors C39A, C28A. This return circuit is completed by the Facility Switch in all positions except H.T. OFF, when h-t is

SECTION 9 (Contd.)

removed from the Reception Set proper by opening the earth return line.

Positive high tension is taken from the rectifier cathodes, and is fed direct to the Reception Set h-t line without switching, through a filter comprising chokes L2A, L3A, L3B and capacitors C19K, C25A, C25B, C25C.

S2A, the POWER SELECTOR switch, changes over the input lines to the ON-OFF switch S3A using Section 1; the primary windings of T25A using sections 2 and 3; and the valve heater, etc., supply using Section 3; as required for different types of input.

S2A and S3A are mechanically interlocked so that S2A cannot be switched unless S3A is in the OFF position.

9.9.1 220V A.C. Operation

With S2A in the 220V A.C. position (to the left) both the A.C. input leads are switched to S3A, and thence to the two 110V primary windings of transformer T25A, these two windings being then connected in series.

All filaments, including the rectifiers, pilot lamp and LAMPS, OPERATOR, are supplied from a 12V secondary winding on T25A. The input leads are filtered by capacitors C22B and C22C.

9.9.2 110V A.C. Operation

In this position (central) the two 110V primary windings of T25A are connected in parallel by means of S2A, Sections 2 and 3. Otherwise the arrangement is the same as above for 220V operation.

9.9.3 12V D.C. Operation

With S2A in the 12V D.C. position (to the right) the positive side of the input line is switched through S3A to the centre-tap of the 12V primary winding of transformer T25A, via a filter consisting of choke L4A and electrolytic capacitors C29A, C29B. The coil of the vibrator cartridge is supplied from this same point through an additional filter L4D and C17M, C26A.

The negative side of the D.C. input is connected direct to the chassis.

SECTION 9 (Contd.)

Each outside connection of the 12V primary winding goes to a contact of the vibrator, through a filter consisting of L4B, C17K in one case, and L4C, C17L in the other. The buffer circuit for vibrator operation is formed by resistors R25A, R25B and capacitors C27A and C27B across the h-t secondary winding. Both D.C. input leads are filtered, by capacitors C40A, C40B and C26B.

All valve heaters, etc., are supplied through the ON, OFF switch S3A and the POWER SELECTOR switch S2A, Section 3, while the 12V A.C. secondary winding and the two 110V A.C. primary windings are left open-circuited.

9.9.4 Fuses

Three extractor type fuse holders are located at the upper right hand corner of the front panel.

That on the left, marked D.C. 10A, is fuse F1A in the centre tap of the 12V D.C. primary winding.

The centre fuse, marked A.C. 3A, is F2A in one line of the 110V or 220V A.C. input.

The third fuse, on the right, is marked H.T. 250 mA, being F3A in the centre tap of the h-t secondary of transformer T25A.

10. MAINTENANCE

10.1 General

10.1.1 Manufacturer's Setting of Adjustments

The RECEPTION SET No. 8C is tested by the manufacturer with precision instruments, and all adjustments are locked and sealed. Realignment should be necessary only when components in certain circuits have been replaced or repaired. It should not be assumed that realignment is required because a component, except in a tuned circuit, has been replaced. First check the performance of the RECEPTION SET, and realign only if it is below normal.

It is especially important that the adjustments should not be interfered with in any way, unless in association with the correct testing instruments listed below.

If adjustment is required, the seals covering the adjusting screws must be broken, and the locking nuts loosened.

Under no circumstances should the plates of the four-gang tuning capacitor assembly (C14A/1, 2, 3, 4) be adjusted. This assembly is aligned by the manufacturer and cannot be readjusted without precision instruments.

10.1.2 Setting of Controls

In all operations covered in this section, the RECEPTION SET controls should be in the following positions, unless otherwise indicated:

Facility Switch	-	A.V.C. OFF
A.F. GAIN	-	Maximum clockwise
R.F. GAIN	-	Maximum clockwise
LOUDSPEAKER	-	OFF
CRYSTAL switch	-	OUT
SELECTIVITY control	-	MIN.
PHASING control	-	At centre bar
B.F.O. CONTROL	-	At centre bar
AERIAL TRIMMER	-	Adjust for maximum output at each test frequency.

SECTION 10 (Contd.)

10.2 Testing Instruments

Recommended instruments for use in the alignment of the RECEPTION SET are as follows:

10.2.1 Standard Signal Generator

Frequency Range	-	400 Kc to 26 Mc
Output Range	-	1 microvolt to 1 volt
Internal Modulation	-	30% at 400 cycles.

10.2.2 Dummy Aerial

I.R.E. standard in series with output termination of Standard Signal Generator.

10.2.3 Output Meter

This instrument should have an input impedance suitable for bridging 600 ohms, and a range of 5-1,000 milliwatts.

The most convenient method of connection is into the 600 ohm LINE JACK, with a 600 ohm non-inductive resistor across the meter terminals to load the output transformer T24A.

10.2.4 D.C. Micro-ammeter

This meter should have a range of either 0-50 or 0-100 micro-amperes.

10.3 I.F. Alignment (Refer Fig. 3).

10.3.1 Output Loading

NOTE: It is important that, before the high tension is switched on, the output meter be connected as in paragraph 10.2.3 above when the LOUDSPEAKER is switched OFF. Otherwise, damage to the output valve may result. If phones are used instead of the loudspeaker, by plugging into the other 600 Ω LINE JACK, the same warning applies when the phones are removed.

10.3.2 Procedure

(i) Switch loudspeaker ON, or plug phones into the

SECTION 10 (Contd.)

600 Ω LINE JACK. Plug in Band D coil unit and set dial to 0. Turn the Facility Switch to A.V.C. OFF.

(ii) Disconnect the grid clip from the top cap of valve V2A, and connect the active lead of the Standard Signal Generator in its place, with the earthed lead connected to the chassis of the RECEPTION SET. Switch the Signal Generator modulation off.

(iii) (See iv below). Remove the Crystal from its mounting and plug it into an external oscillator. Loosely couple the output of this oscillator to the control grid of valve V2A. Increase the unmodulated output from the Signal Generator and tune it until a beat note is heard in the loudspeaker or phones. When the Signal Generator is adjusted to zero beat with the external oscillator, it is tuned to the same frequency as the crystal supplied in the RECEPTION SET (i.e. to the correct intermediate frequency).

(iv) NOTE: The method of (iii) above, using an external oscillator, will be necessary only when the i-f transformers are badly out of alignment. If the adjustments are not far out the following procedure may be adopted.

Turn the CRYSTAL switch to IN and the SELECTIVITY control to MAX. Couple the Signal Generator (unmodulated) into the grid of valve V2A as in (ii) above, and set it to approximately 455 Kc. Now tune the Signal Generator about this frequency and locate the point where a high-pitched rushing noise is heard in the loudspeaker or phones. Increase the Signal Generator output if necessary. In the centre of the zone of high-pitched noise a null-point will be found, which is the frequency of the crystal. Tune the Signal Generator to the centre of the null-point.

Alternatively, turn the Facility Switch to B.F.O. ON, and tune the Signal Generator for a peak in the audio beat note obtained. The Signal Generator frequency at which this peak occurs is independent of the B.F.O. CONTROL, and the pitch of the beat note may be varied by the B.F.O. CONTROL, if desired, so that a beat of 500-1,000 cycles occurs at the "peak" setting of the Signal Generator. The peak in audio output will then be more distinct than if the B.F.O. CONTROL is close to the zero-beat position.

SECTION 10 (Contd.)

(v) Replace the crystal in the RECEPTION SET and remove the coupling from the external oscillator, if method (iii) above has been used. If method (iv) above is employed, return the CRYSTAL switch to OUT, the SELECTIVITY control to MIN., and the B.F.O. CONTROL to the centre bar.

(vi) Turn the Facility Switch to the H.T. OFF position. Switch the loudspeaker OFF, or remove the phones from the 600 Ω LINE JACK, as the case may be. Connect the output meter into the 600 Ω LINE JACK, and return the Facility Switch to the A.V.C. OFF position.

(vii) Switch on the modulation of the Standard Signal Generator (30% at 400 cycles). Adjust the input to the control grid of valve V2A so that an output meter reading of approximately 50 milliwatts is obtained (approx. 5.5V across 600 ohms).

(viii) Using an insulated screwdriver, adjust the magnetite cores at the top of i-f transformers T21A and T20A for maximum peak output. The locknuts on these adjustments must be loosened, as required.

(ix) Reverse the chassis and adjust the cores at the bottom of i-f transformers T21A, T20A and T19A for maximum peak output.

(x) Repeat adjustments (viii) and (ix).

(xi) Turn the Facility Switch to B.F.O. ON, and switch off the Signal Generator modulation. Adjust the magnetite core of T22A until zero beat is obtained with the B.F.O. CONTROL set at the mid-point of its centre bar.

(xii) Tighten all lock-nuts which have been loosened.

10.4 Crystal Filter Alignment (Refer Fig. 3).

(i) Disconnect the V3A-cathode end of resistor R13A, and connect the D.C. micro-ammeter between this resistor and the cathode. Set the CRYSTAL switch to IN, the SELECTIVITY control to MIN. and the PHASING control to the centre bar.

(ii) Tune the Standard Signal Generator (unmodulated) to a frequency of approximately 445 Kc or 465 Kc (i.e., 10 Kc

SECTION 10 (Contd.)

either side of the i-f frequency). Adjust the Signal Generator output until a reading of approximately 10 or 20 micro-amperes is obtained on the meter.

(iii) Using an insulated screwdriver, adjust the trimmer capacitor C34A until a minimum reading is shown on the micro-ammeter. As the condition for minimum reading is approached, it may be necessary to increase the input from the Signal Generator, or to tune it slightly closer to 455 Kc, to obtain a readable indication on the meter.

(iv) Reset the Signal Generator to 455 Kc, and adjust its output until a reading of approximately 20 micro-amperes is obtained.

(v) While varying the tuning of the Signal Generator between approximately 454 Kc and 456 Kc, adjust the magnetite core of the i-f inductor L1A until the peak reading obtained on the micro-ammeter is at a minimum. If two peaks appear, adjust L1A until they are equal. At this minimum peak reading it will be found that the micro-amperes current remains substantially constant between these frequencies.

(vi) Set the SELECTIVITY control to MAX., and the PHASING control to the fully anti-clockwise position.

(vii) Vary the Signal Generator frequency about the 455 Kc. setting, and measure the frequency difference between the sharp peak of output and the adjacent sharp dip (as seen on the microammeter). The dip will occur on the high frequency side of the peak, and will be in the order of 50 db. below it in output.

(viii) Set the PHASING control to the fully clockwise position, and again vary the Signal Generator frequency. Measure the frequency difference between the peak and the adjacent dip, which will now occur on the low frequency side of the peak.

(ix) If the two measured frequency differences are unequal, slightly re-adjust the PHASING control trimmer C34A as described in (iii) above until equality to within 0.2 Kc. is obtained. After each re-adjustment of C34A, the steps (iv) to (viii) above should be repeated.

(x) Finally, each frequency difference should be approximately 1.0 Kc., $\pm$ 0.2 Kc.

SECTION 10 (Contd.)

(xi) To ensure that the alignment is now correct, a check should be made on the bandwidth at 6.0 db. down. With the SELECTIVITY control at MAX., this should be approximately 400 cycles. With the control at MIN., it should be approximately 4.0 Kc., and symmetrical to within 1.0 Kc.

(xii) Disconnect the Standard Signal Generator from the control grid of V2A and replace the grid clip. Remove the microammeter from the diode circuit, and replace resistor R13A as before. Switch the CRYSTAL to OUT and turn the SELECTIVITY to MIN.

10.5 R.F. Alignment (Refer Fig. 3).

(i) Connect the active lead from the Standard Dummy Aerial to the Aerial terminal of the RECEPTION SET, with the earthy side of the Dummy Aerial connecting to the chassis or the EARTH terminal. Turn the Facility Switch to H.T. OFF and remove Band D coil unit.

(ii) Plug in Band A coil unit, and return to A.V.C. OFF. Set the Standard Signal Generator to 26 Mc, modulated 30% at 400 ∿. Tune the RECEPTION SET to give maximum output at this frequency.

If calibration is not correct, adjust the trimmer capacitor C3C until the dial reading corresponds to the frequency as shown on the curve at the front of the coil unit. C3C is located behind the front panel at the right hand end of the coil unit, just below the tuning capacitor assembly. In this and following adjustments, the locknuts should be loosened where necessary.

(iii) Adjust trimmer capacitors C3B and C3A, in turn, for maximum output, while rocking the dial back and forth through the signal. C3B and C3A are located second and third, respectively, from the right hand end of the coil unit.

NOTE: Care must be taken in alignment at this point to ensure that the RECEPTION SET is aligned to the correct frequency, and not to the image frequency, which will be approximately 910 Kc lower than the true signal.

(iv) Set the Standard Signal Generator at 15.0 Mc, and tune the RECEPTION SET for maximum output at this frequency.

If calibration is incorrect it may be altered by the magnetite core of r-f transformer T3A, which is located

SECTION 10 (Contd.)

beneath the chassis at the rear centre of the coil box which contains C3C.

(v) Adjust in turn the magnetite cores in the r-f transformers T2B and T2A, which are in the adjacent coil boxes, until maximum output is obtained.

(vi) Repeat adjustments (ii) to (v).

(vii) Align bands B, C, and D in a similar manner at the following frequencies:-

Band B	14.0 and 8.0 Mc
Band C	7.0 and 4.0 Mc
Band D	3.75 and 2.0 Mc

Note that in these three bands, magnetite core adjustments are provided in the oscillator coils only, and not in the r-f transformers, so the step in (v) above is omitted.

(viii) When the RECEPTION SET has been satisfactorily aligned, lock all tuning adjustments.

10.6 Removal of Crystal

The crystal is mounted in a socket on top of the crystal filter unit, and protected by a cover plate. To remove, loosen the screws holding each side of the cover plate flange, and withdraw the cover towards the rear. The crystal may now be withdrawn from its socket towards the front panel.

10.7 A.F. GAIN Control

This control is a 1.0 megohm attenuator with 28 contacts. Fig. 2 is a schematic diagram of the component showing resistance values between contacts. Resistors are all I.R.C. type BT1/2. Should the contacting surfaces require cleaning, unscrew the cover and wipe the contacts with a clean piece of lintless cloth. The rotor should be cleaned by carefully passing a piece of the cloth, singly, between it and the contacts.

After cleaning, the contacts should be touched with a smear of pure petroleum jelly.

SECTION 10 (Contd.)

Should the spindle require cleaning and regreasing, it may be removed by loosening the two set screws in the rotor boss. The correct grease for this purpose is Shell Anti-freeze Grease DTD/143C. The three screws surrounding the rotor boss must not be loosened as this will upset the adjustment of the bearing.

10.8 Dial Replacement

The dial is fastened by two set screws located in the knob assembly. Upon replacement it is important that the scale be set in correct relationship to the tuning capacitor to ensure correct calibration. See that the tuning capacitor plates are fully meshed, then fit the dial with the scale reading 0.

TABLE I.

Sensitivity, Stage Gains, Etc.

The following table is given as a guide for use when checking faulty stages, valves, etc., in the unit, and the figures are approximate only. It will be appreciated that the sensitivity at the 1st R.F. grid is the important factor, and if this is found to agree closely with the figures below, fairly large variations in the succeeding stages may be ignored.

Controls on the Rec. 8C should be set as indicated previously under para. 10.1.2, except that the A.F. GAIN is reduced, if necessary, to achieve an output of 50 mW for each test.

The grid cap should be removed from the valve concerned, and the output from the Standard Signal Generator (via the All-wave Dummy Aerial) connected in its place between grid and earth.

Input to grid of:	Frequency	Input Required (for 50 mW)
1st A.F. (V3A)	400 cycles	30 mV
2nd I.F. (VID)	455 Kc.	6.5 mV
1st I.F. (VIC)	455 Kc.	220 µV
Mixer (V2A)	455 Kc.	60 µV

		Band A	Band B	Band C	Band D
Mixer (V2A)	X	60 µV	65 µV	75 µV	85 µV
2nd R.F. (VIB)	X	30 µV	25 µV	17 µV	15 µV
1st R.F. (VIA)	X ø	4.5 µV	3 µV	3 µV	3 µV

X High and low frequency ends of each band, as specified previously under para. 10.5 (R.F. Alignment).

ø With the specified input, and an output of 50 mW, the signal-to-noise ratio should be not worse than 2:1.

TABLE II.

Typical Socket Voltages and Currents (Approx. Only)

Measurements taken with the Rec. 8C. operating on 220V A.C.; no signal input; controls set as previously outlined in paragraph 10.1.2 and tuning dial at 0; Band D coil unit; meter resistance 1,000 ohms per volt.

Valve	Anode V.	Screen V.	Cath. V.	Anode mA.	Screen mA.
V1A (6U7-G) 1st R.F.	250	90	2.7	7.0	1.5
V1B (6U7-G) 2nd R.F.	250	90	2.7	7.0	1.5
V2A (6J8-G) Convert.	260	85	1.5	1.5	2.75
V5A (6J7-GT) Osc.	100-130 ø	---	---	X	----
V1C (6U7-G) 1st I.F.	250	90	4.0	5.0	1.25
V1D (6U7-G) 2nd I.F.	255	90	4.0	5.0	1.3
V3A (6G8-G) Det., AVC and A.F.	90 ø	30 ø	1.8	0.5	0.15
V4A (6V6-GT) Output	255	270	13.0	45	4.0
V5B (6J5-GT) B.F.O.	110 ⊕	---	---	3.0 ⊕	---

X Bands A and B -- 6.0 mA. Bands C and D -- 4.0 mA.

ø Measured on 1,000 V Range of meter.

⊕ Facility Switch at B.F.O. ON.

APPENDIX 1. COMPONENT SCHEDULE

Circ.Ref. No.	Band.	Description	V.A.O.S.	Code Number
(a) Resistors				
R1A) B)	A B	20,000 Ω, 1W.		600707
R2A) B)	C C	16,000 Ω, 1W.		600705
R3A) B)	D D	8,000 Ω, 1W.		600699
R4A) B) C)	C Grid Leak D	32,000 Ω, 1W.		600711
R5B) C)		40,000 Ω, 1W.		600713
R6A) B) C) D)		0.1 MΩ, 1/2W, carbon		
R7A) B) C)		320 Ω, 1W, carbon	ZAA6799	
R8A) B) C) D) E)		2,000 Ω, 1W.	ZAA6711	600687
R9A		3,000 Ω, W/W, variable		13189
R10A B C D E F G		50,000 Ω, 1W.	ZAA671	600715
R11A		63,000 Ω, 1W.	ZAA6675	600717

APPENDIX 1 (Contd.)

Circ.Ref. No.	Band.	Description	V.A.O.S.	Code Number
R12A) B)		630 Ω, 1W.		600677
R13A		0.25 MΩ, 1W.	ZAA677	600729
R14A		3,200 Ω, 1W.	ZAA6671	600691
R15A B C D E		1 MΩ, 1W.	ZAA680	600741
R16A		1 MΩ, Variable potentiometer (see Fig.2.)		16430A
R17A		0.5 MΩ, 1W.	ZAA679	600735
R18A		0.2 MΩ, 1W.	ZAA676	600727
R19A		3.2 MΩ, 1W.		600751
R20A		250 Ω, 3W., W.W.	ZAA646	602369
R21A		50,000 Ω, 1/2W, carbon	ZAA698	
R22A		0.5 MΩ, 1/2W, carbon	ZAA703	
R23A		40 Ω, 3W, W.W.	ZAA6409	602353
R24A		Not used		
R25A) B)		100 Ω, 3W, W.W.		602361
R26A		250 Ω, W.W. Variable		12612
R27A		10,000 Ω, 1W.		600701

(b)Capacitors

C1A) B) C)	A A A	480 μμF, ± 2.1/2%, 500V.W., silver mica	226000 Series

APPENDIX 1 (Contd.)

Circ.Ref. No.	Band	Description	V.A.O.S.	Code Number
C2A)	A	4 μμF, 500V.W.,	ZAA2800	224233
B)	A	mica		
C)	B			
D)	B			
E)	B.F.O.			
F)	Coupling			
G)	C			
H)	C			
J)	D			
K)	D			
C3A)	A	3-25 μμF, air var-		13901
B)	A	iable		
C)	A			
D)	B			
E)	B			
F)	B			
G)	C			
H)	C			
J)	C			
K)	D			
L)	D			
M)	D			
C4A)	A	14 μμF, 500V.W.,		13211 Series
B)	A	mica		
C5A)	A	0.01 μF, 750V.W.,		224801
B)	B	mica		
C) H.T.By-pass				
D)	C			
E)	D			
C6A	A	200 μμF, ± 2.1/2%, 500V.W., silver mica		226000 Series
C7A	A	200 μμF, 500V.W., N750, silver mica		220467

APPENDIX 1 (Contd.)

Circ.Ref. No.	Band	Description	V.A.O.S.	Code Number
C8A) B)	B B	9 μμF, 500V.W., mica		13211 Series
C) D)	C C			
E) F)	D D			
G)				
C9A	B	3,000 μμF ± 2½%, 500V.W., mica		13213 Series
C10A	C	2,000 μμF ± 2½%, 500V.W., mica		13213 Series
C11A	D	1,200 μμF ± 2½%, 500V.W., mica		13212 Series
C12		Not used		
C13		Not used		
C14A		19-245 μμF, air (4-section gang)		U13504
C15A		4-40 μμF, air variable		13649
C16A) B) C) D) E)		0.05 μF, 200V.W., paper		16399 Series
C17A) B) C) D) E) F) G) H) J) K) L) M) N) P)		0.1 μF, 200V.W., paper		16399 Series

APPENDIX 1 (Contd.)

Circ.Ref. No.	Band	Description	V.A.O.S.	Code Number
C18B) C)		25 µF, 40V.P., electro.		222912
C19A) B) C) D) E) F) G) H) J) K)		0.1 µF, 600V.W., paper		16399 Series
C20A		500 µµF, 500V.W., mica	ZAA2806	224275
C21A) B)		0.01 µF, 200V.W., paper		16399 Series
C22A) B) C)		0.02 µF, 600V.W., paper		16399 Series
C23A		750 µµF, 500V.W., silver mica	ZAA2706	226000 Series
C24A) B) C) D) E)		250 µµF, 500V.W.,	ZAA2782	226169
C25A) B) C)		20 µF, 600V.P., electro.		Ducon EE10594
C26A) B)		0.5 µF, 200V.W., paper		16399 Series
C27A) B)		0.03 µF, 600V.W., paper		16399 Series
C28A		5,000 µµF, 500V.W., mica	ZAA2810	224295

APPENDIX 1 (Contd.)

Circ.Ref. No.	Band	Description	V.A.O.S.	Code Number
C29A) B)		100 µF, 40V.P., electro.		Ducon EE10720
C30A		6 µµF, 500V.W., N750, silver mica	ZAA2900	220437
C31A		12 µµF, 500V.W., N750, silver mica		220443
C32A) B)		80 µµF, 500V.W., silver mica		226159
C33A) B)		50 µµF, 500V.W., silver mica		226155
C34A		3-30 µµF, variable air		13012
C35A		3-9 µµF, variable air		13903
C36A		3.5 - 17 µµF, variable air		13902
C37A) B)		100 µµF, 500V.W., mica	ZAA2804	224261
C38A		50 µµF, 500V.W., mica	ZAA2802	224255
C39A		0.25 µF, 600V.W., paper		16399 Series
C40A) B)		0.01 µF, 500V.W., mica		224501
C41A		8 µF, 525V.P., electro.		Ducon EG10810

(c) Inductors and Transformers

L1A		X'tal Filter output coil		13195

APPENDIX 1 (Contd.)

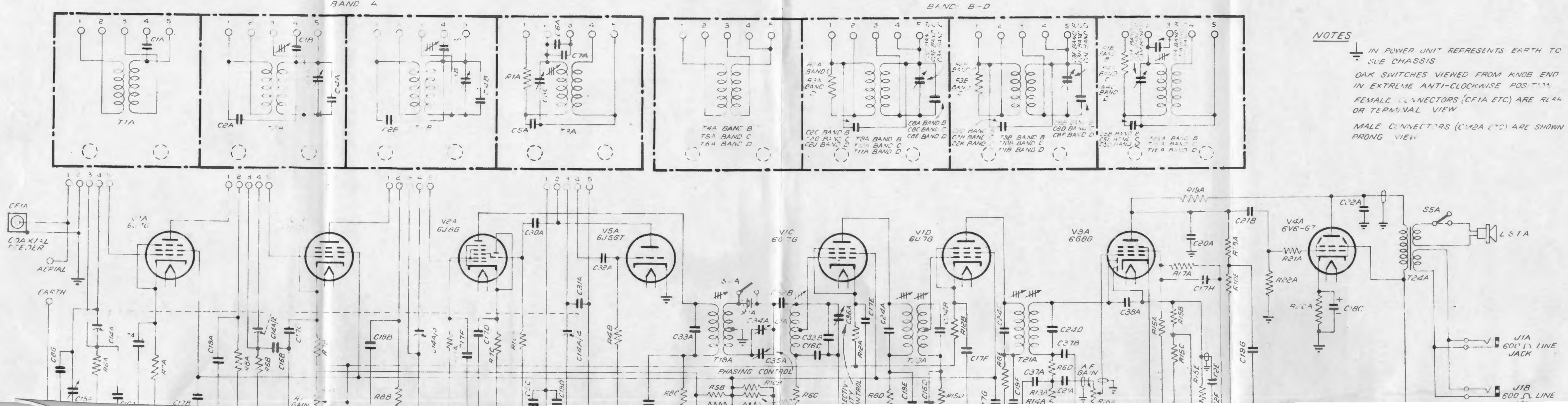
Circ.Ref. No.	Band	Description	V.A.O.S.	Code Number
L2A) B)		500 µH, 150 mA		13809
L3A) B)		6 H, 100 mA.		1TX6731
L4A) B) C) D) E)		20 µH, 6A.		3149
T1A	A	Aerial		13265
T2A) B)	A	1st & 2nd R.F.		13263
T3A	A	Osc.		13261
T4A	B	Aerial		13259
T5A	C	Aerial		13253
T6A	D	Aerial		13247
T7		Not used		
T8		Not used		
T9A) B)	B	1st & 2nd R.F.		13257
T10A) B)	C	1st & 2nd R.F.		13251
T11A) B)	D	1st & 2nd R.F.		13245
T12		Not used		
T13		Not used		
T14		Not used		
T15A	C	Osc.		13249

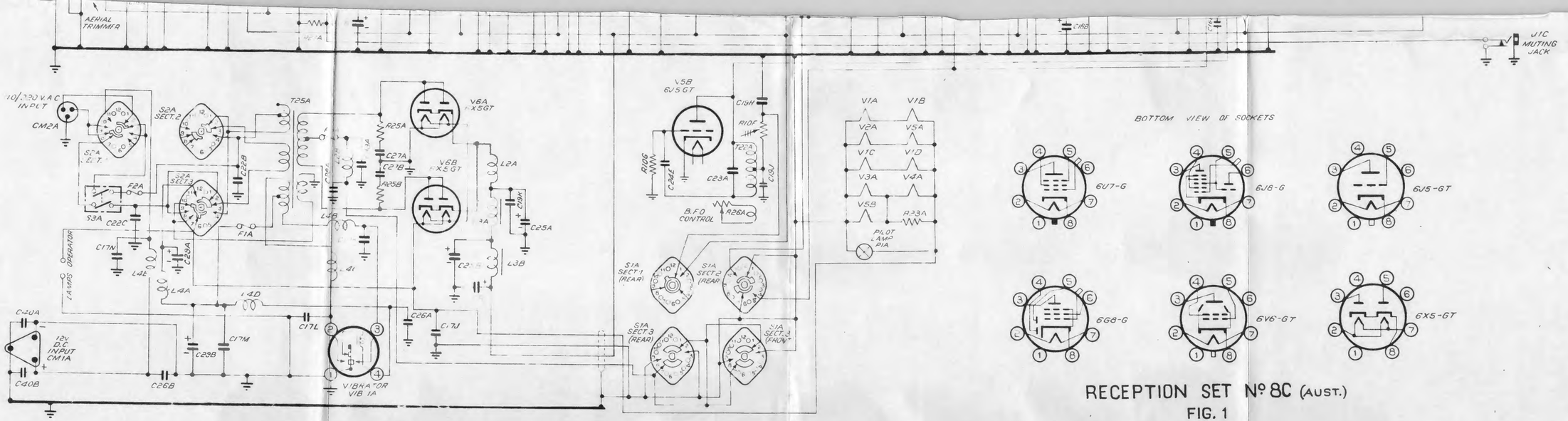
APPENDIX 1 (Contd.)

Circ.Ref. No.	Band	Description	V.A.O.S.	Codo Number
T16A	D	Osc.		13243
T17		Not usod		
T18		Not usod		
T19A		I.F. X'tal filt.Trans.		13197
T20A		1st I.F. Transformer		13191
T21A		2nd I.F. Transformer		13193
T22A		B.F.O. tuning		12669
T23A	B	Osc.		13255
T24A		Output Transformer		2TU14034
T25A		Power Transformer		3TK14017
(d) Switchos				
S1A		Facility		13743
S2A		Power Solector		51062-19
S3A		ON - OFF		12016
S4A		Crystal IN - OUT		13704
S5A		Loudspeakor ON - OFF		51062-74
(o) Miscellaneous				
J1A) B) C)		Jacks, single Circuit		51062-64
CM1A		Connector, 3 point, male	ZAA4026	10581A
CM2A		Connector, 3 point, male		51084V58-4

APPENDIX 1 (Contd.)

Circ.Ref. No.	Band	Description	V.A.O.S.	Code Number
CF1A		Connector, Coaxial Feeder, female		R.E.C. 125
F1A		Fuse, Cartridge 10A.		370013
F2A		Fuse, Cartridge 3A.		370011
F3A		Fuse, Cartridge 250 mA.		370004
P1A		Pilot Lamp, 12V. 0.25A, M.E.S.		428145
X1A		Crystal 455 Kc. ± 0.1%		R5587 Series
VIB1A		Vibrator, non-sync. 12V. Oak Type		V5123
LS1A		Loudspeaker		51069-W21

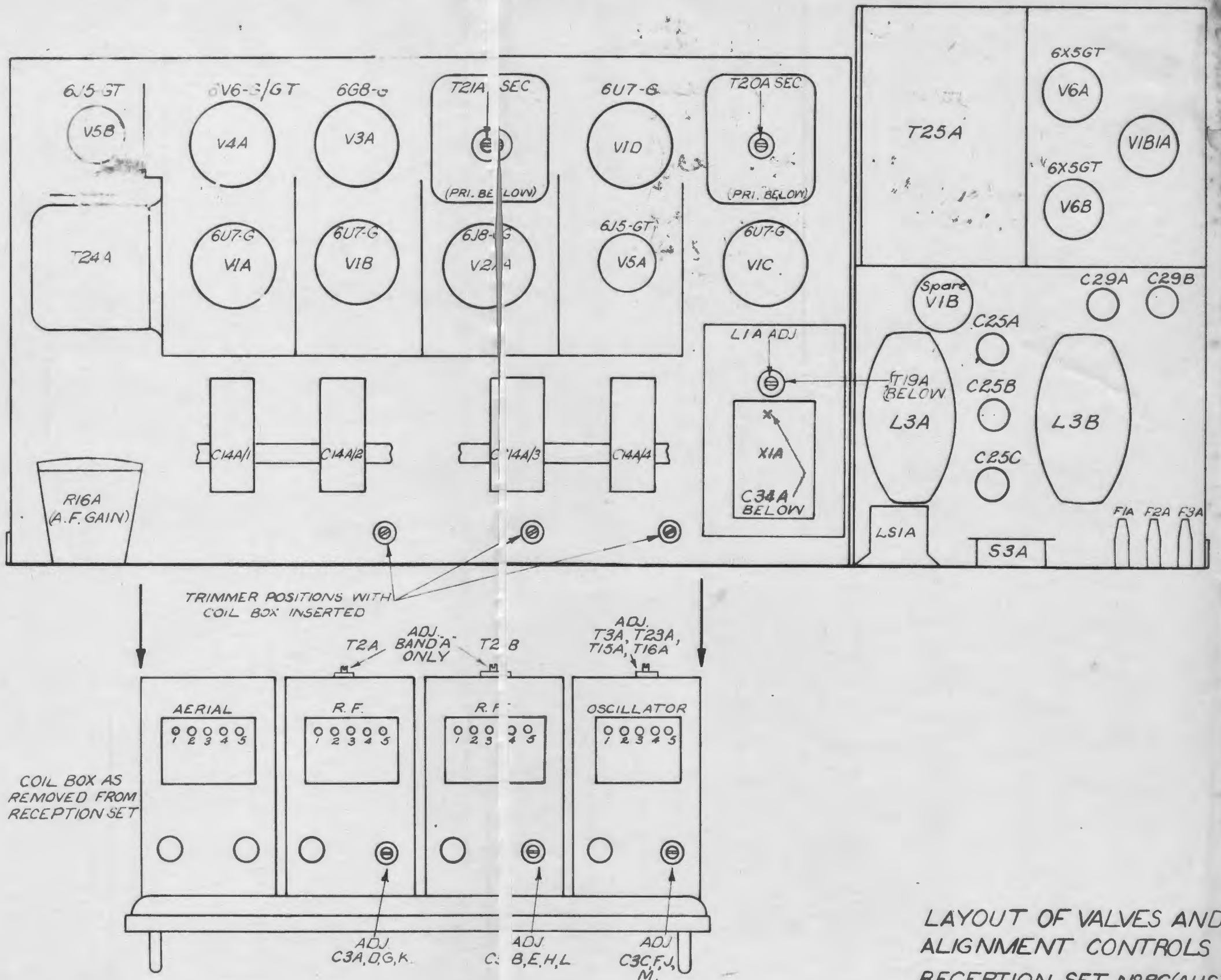

BAND A
BAND B-D
T1A
T2A
T3A
T4A BAND B
T5A BAND C
T6A BAND D
T9A BAND B
T10A BAND C
T11A BAND D
T8A BAND B
T10B BAND C
T11B BAND D
NOTES
IN POWER UNIT REPRESENTS EARTH TO SUB CHASSIS
OAK SWITCHES VIEWED FROM KNOB END IN EXTREME ANTI-CLOCKWISE POSITION
FEMALE CONNECTORS (CF1A ETC) ARE REAR OR TERMINAL VIEW
MALE CONNECTORS (CM2A ETC) ARE SHOWN PRONG VIEW
CF1A
COAXIAL FEEDER
AERIAL
EARTH
V1A 6U8G
V2A 6U8G
V5A 6U5GT
V1C 6U7G
V1D 6U7G
V3A 6688
V4A 6V6-GT
S4A
PHASING CONTROL
AF GAIN
S5A
L S1A
J1A 600Ω LINE JACK
J1B 600Ω LINE



BOTTOM VIEW OF SOCKETS

RECEPTION SET Nº 8C (AUST.)

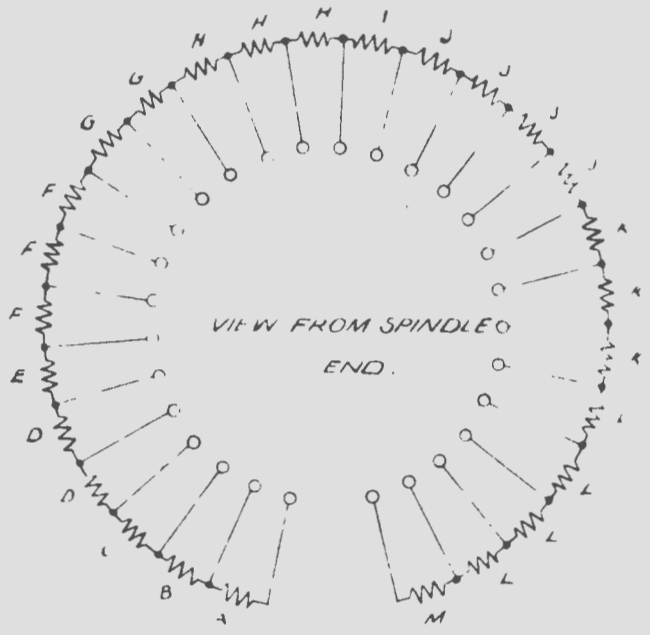
FIG. 1



LAYOUT OF VALVES AND ALIGNMENT CONTROLS

RECEPTION SET No 8C(AUST)

FIG 3



CODE.	VALUE.	CODE.	VALUE.
A	320 Ω	H	100 000 Ω
B	500 Ω	I	200 000 Ω
C	800 Ω	J	320 000 Ω
D	1,000 Ω	K	500,000 Ω
E	2000 Ω	L	0·1 MEG Ω
F	3,200 Ω	M	0·2 MEG Ω
G	5,000 Ω		

RESISTANCE VALUES
A.F. GAIN CONTROL
FIG. 2.