Amalgamated WORLD WIDE WIRELESS Wireless (Australasia) Ltd

INSTRUCTION BOOK NO. 1-13500R

INSTALLATION, OPERATION AND MAINTENANCE

U.S. SIGNAL CORPS

MODEL AMR-101 RECEIVER

47 York Street, Sydney

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ADDENDUM

Page 19 and Plate 1.

The A.C. mains and Battery Connectors shown packed in the Accessories Case are now packed in the Receiver-Power Unit Case.

Amalgamated Wireless (A'sia) Limited

47 York Street

SYDNEY

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CHAPTER I

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INSTRUCTIONS FOR

INSTALLING, OPERATING AND MAINTAINING

U.S. SIGNAL CORPS

MODEL AMR-101 RECEIVER

CHAPTER 1

GENERAL DESCRIPTION

1.1 Introduction

The AMR-101 Communications Receiver is a nine-valve high-gain superheterodyne with a frequency response coverage of 0.48 to 26 megacycles in six bands employing plug-in coil units. It may be mains operated from 110 or 240 volts ac, 40-60∿ or, alternately, battery-operated from a 12 volt accumulator.

Designed primarily for service conditions, the AMR-101 equipment is packed in two waterproof cases, is impregnated throughout to render it impervious to tropical conditions and incorporates stabilised circuits to ensure permanency of adjustment under conditions of extreme changes in temperature and humidity as well as unusual mechanical vibration.

Other features in the design of the receiver are - Single Signal Unit with a front panel variable selectivity control with sufficient range for phone reception and a phasing control for heterodyne elimination; Separate Universal Power Unit for silent operation; Micrometer dial giving direct reading to one part in 500; Beat Frequency Oscillator for c-w reception; Automatic volume control which may be switched off when desired; Separate r-f and a-f gain controls; Aerial trimmer for aerial matching; Meter for measuring signal strength and audio output across 600 ohms; H.T. voltage switching, providing a stand-by condition.

1.2 Physical Specifications

The equipment is supplied packed in two waterproof carrying cases as shown in Plate 1. A rubber gasket is employed to seal the covers and care should be taken to ensure that the winged nuts fastening the covers are fully tightened during transit. A complete equipment schedule is given in Table I.

The front panels of the Receiver and Power Unit are designed so that they may be rack mounted if desired.

Weights and dimensions of the equipment, including the carrying cases, are given in Table II.

1.3 Electrical Specifications

1.3.1 Receiver

(a) Frequency Ranges

Band A:	14.3 - 26 Mc.
Band B:	7.0 - 14.6 Mc.
Band C:	3.5 - 7.3 Mc.
Band D:	1.85 - 3.9 Mc.
Band E:	0.9 - 1.9 Mc.
Band F:	0.48 - 1.0 Mc.

(b) R.F. Alignment Frequencies

Band A:	24 and 14.8 Mc.
Band B:	14.2 and 7.3 Mc.
Band C:	7.1 and 3.7 Mc.
Band D:	3.8 and 1.9 Mc.

Band E: 1.85 and 0.94 Mc.
Band F: 0.98 and 0.5 Mc.

(c) Intermediate Frequency

455 kc.

(d) Valves

1 - 6U7G		1st R.F. Amplifier
1 - 6U7G		2nd R.F. Amplifier
1 - 6J8G		Converter
1 - 6J5GT		Local Oscillator
1 - 6U7G		1st I.F. Amplifier
1 - 6U7G		2nd I.F. Amplifier
1 - 6G8G		Detector, A.V.C. and A.F. Amplifier
1 - 6J5GT		Beat Frequency Oscillator
1 - 6V6G		Output

1.3.1 Universal Power Unit

(a) A.C. Operation

Input Voltage and Frequency - 110-240 volts, 50-60~

Power Consumption - 70 watts

(b) Battery Operation

Input Voltage - 12 volts D.C.
Current Consumption - 5.5 amps.

(c) Valves

2 - 6X5GT Rectifiers

(d) Vibrator

12V Non-Synchronous, Oak Type V5123

1.3.3 Loudspeaker Unit

Voice Coil Impedance - 3.7 ohms at 400~

1.4 Aerial and Earth

Provision is made in the design of the receiver for the use of either a doublet or single wire type of aerial. There are two input terminals, one marked "A1" and the other "A2" and adjacent to these is a is a third terminal marked "EARTH". When using a single wire it should be connected to the terminal "A1" and the terminal "A2" should be connected to the chassis using the pigtail lead and clip provided. Doublet aerial feeders should be connected to the terminals "A1" and "A2", in which case the pigtail is not used, but should be clipped on to the terminal to which it is affixed to prevent a short circuit. Refer to Fig. 1 - Aerial Connections. An earth connection is usually desirable for battery operation, but is seldom necessary when operating the receiver from the mains, although, under certain conditions it may be found that its use improves reception. If an earth is used it should be connected to the terminal marked "EARTH". Care should be taken to install an efficient earth; otherwise it may cause noisy reception and/or fading. A short direct lead of not less than 7/22 insulated cable firmly connected to a water pipe, which travels under the ground, is recommended. An alternative earth connection may be made to a metallic stake driven five to eight feet into damp soil.

CHAPTER II

INSTALLATION AND OPERATION

2.1 Connecting Up

2.1.1 Universal Power Unit

The power unit is supplied with a plate covering the a-c mains input plug at the lower rear of the unit. Remove this plate and while referring to Fig. 2, set the MAINS selector switch at the required voltage. The switch has two positions, namely, 110 volts ac clockwise and 240 volts anti-clockwise. As the switch is turned the voltage is shown on the indicator on the front panel.

See that the correct fuses are fitted. The 3 amp. A-c mains and the 10 amp. battery fuses are located on the panel at the rear of the unit, the ratings being shown on the panel. The 250 mA HT fuse is fitted in the fuse-holder mounted on the front panel. To replace this fuse, unscrew the fuse-holder cap which contains it and insert a replacement fuse in the cap.

The AC-DC and ON-OFF switches are mechanically inter-locked, making it impossible to change from AC MAINS to DC 12 VOLTS unless the ON-OFF switch is at OFF. Therefore, while setting up the equipment, see that the ON-OFF switch on the front panel is in the OFF position.

Plug the four -point connector attached to the receiver into the socket at the rear of the power unit and connect the metal braiding attached to the connector to the chassis, using the screw provided; see Fig. 2.

2.1.2 A-C Mains Operation

Set the AC-DC switch to the A-C MAINS position. Plug the A-C MAINS connector supplied into the 2-point plug at the rear of the power unit and screw the plate carrying the socket to the power unit chassis. Plug the connector into the a-c mains.

2.1.3 Battery Operation

Set the AC-DC switch to the DC 12 VOLTS position. Proceed as in 2.1.1, replace the cover plate and connect the battery connector to the three point plug at the rear of the unit. The connector has two leads each terminating with a clip. The positive lead is red and the negative lead black. Connect the red lead to the positive (+) terminal and the black lead to the negative (-) terminal of the battery. If two 6 volt batteries are used connect them using the battery link supplied.

<u>NOTE:</u> Because of the possibility of vibrator interference it is not advisable to operate the equipment from batteries with the AC mains connector plugged into the unit, although this may be done without damage to the equipment for emergency operation.

2.1.4 Loudspeaker Unit and Headphones

The loudspeaker unit cable is fitted with a four-point plug. Connect this plug to the four-point socket at the rear of the receiver.

Provision is made for connecting two pairs of headphones, the jacks being situated at the left-hand side of the front panel.

The headphone outlets are connected in parallel and are designed to match a 600 ohms impedance line. As the impedance of the headphones are 2,000 ohms, closest matching will be obtained with both pairs of headphones connected.

<u>WARNING</u>: While the power supply is switched on, it is essential that the loudspeaker and/or the headphones be connected, otherwise the output valve will be damaged.

2.2 <u>Operation</u>

2.2.1 <u>Controls</u> (see Plates 2 and 3)

(i) <u>Tuning Dial and Calibration Curve</u>

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

A curve located on each coil unit shows dial readings plotted against frequency; dial readings on the horizontal axis and frequencies on the vertical axis. Stations may be logged on the tablet on the coil unit.

(ii) <u>Selectivity Control</u>

The uppermost knob at the right-hand side of the panel is the variable selectivity control of the single-signal crystal filter. With the crystal filter in use, minimum selectivity is obtained with the pointer at MIN. Turning the knob clockwise from this point will increase selectivity.

(iii) <u>Crystal Switch</u>

Below and slightly to the left of the selectivity control is the crystal switch. This switch is designated IN (Crystal in) or OUT (Crystal out).

(iv) <u>Phasing Control</u>

This control is located directly below the selectivity control. When the pointer is set at the point indicated by a square dot the crystal filter is centrally phased. For the elimination of heterodynes, etc. the control is adjusted to a suitable position on either side of this setting. The control is calibrated for record purposes.

(v) <u>Facility Switch</u>

The four position switch at the bottom right-hand corner. Reading clockwise the positions are HT OFF, AVC ON, AVCX OFF, and BFO ON. With the switch set at the first position (HT OFF) the HT is disconnected but the valve heaters are still in circuit. This position is used when "standing by" with the power on during periods of transmission, <u>or when changing coils</u>, and from it the receiver will begin operating immediately the switch is turned to any of the remaining three positions. The function of positions marked A.V.C. ON and A.V.C. OFF are self-explanatory, being an abbreviation for Automatic Volume Control on and off and the fourth position B.F.O. ON is used to obtain an audible beat note when receiving CE signals or to locate the carrier of weak phone and broadcast stations. After the phone carrier has been found the B.F.O. is, of course turned off.

(vi) B.F.O. Control

The B.F.O. Control is located at the left- hand bottom of the front panel and adjusts the hetero-dyne tone between zero (indicated by bar on panel) and 2,000 cycles/second clockwise and anticlockwise when the facility switch is at B.F.O. ON as explained in para. (v) above. The control is calibrated for record purposes.

(vii) R.F. Gain Control

This control, which is located to the right of the dial, governs the cathode bias applied to the 2nd R.F. and I.F. valves and thus controls the R.F. sensitivity. The control is calibrated for reference purposes.

(viii) A.F. Gain Control

The audio frequency gain control, which is located directly above the B.F.O. control, regulates the audio input to the grid of the 1st A.F. valve and thus controls the audio volume when using either the loudspeaker or headphones. The control is calibrated for record purposes.

(ix) Aerial Trimmer

An aerial trimmer located to the left of the dial is provided for matching the aerial and the input circuit. The trimmer should be adjusted for maximum sensitivity after tuning with the main dial. The trimmer turns continuously and it will be found that it has two peaks. Either peak will do. The trimmer is calibrated for record purposes.

(x) Meter and Switch

The meter has two calibrated scales, one calibrated in "S" units and the other in milliwatts and decibels (db) above 6 milliwatts.

A five-position switch on the right of the meter designated S, OFF, X100, X10, X1 controls the operation of the meter. In the second position the meter is switched out of circuit. The remaining three positions are for indicating audio output across the phone jacks (when correctly terminated), reading 5 watts, 500 milliwatts and 50 milliwatts at maximum, respectively.

2.2.2 Tuning

Changing Coils: when changing coils it is essential to first switch to H.T. OFF. This will eliminate the possibility of an H.T. short-circuit during the operation.

(a) Phone Reception without Crystal Filter

First set the CRYSTAL switch at OUT, the SELECTIVITY control at MIN. and the B.F.O. CONTROL at the centre of the bar marked on the panel.

Set the facility switch at A.V.C. ON or A.V.C. OFF as desired. If the A.V.C. is used the R.F. GAIN control may be advanced fully clockwise to 0 and the volume will then be controlled by the A.F. GAIN control. If A.V.C. is not used it is suggested that the A.F. GAIN control be set in the maximum position and the sensitivity controlled by the R.F. GAIN control. If the R.F. GAIN control does not reduce a strong signal sufficiently, further reduction may be obtained by means of the A.F. GAIN control. The setting of the two gain controls is largely a matter of preference to be determined by the operator and by the receiving conditions prevailing.

The B.F.O. may be used for locating carriers, when the B.F.O. CONTROL is set to the null point, but the facility switch must be returned to its former position when the receiver is tuned to zero beat. Having tuned the station with the main tuning dial, rotate the AERIAL TRIMMER for maximum sensitivity, then, if necessary, re-adjust the gain control(s).

(b) Phone Reception with Crystal Filter

The use of the crystal filter for the reception of phone stations is recommended when adverse conditions prevail, such as interference, static, heterodyne, etc.

First switch the CRYSTAL switch to IN, set the SELECTIVITY control at MIN., the PHASING control to the square dot and the B.F.O. CONTROL at the centre of the bar marked on the panel. The description on the use of the gain controls, the B.F.O. CONTROL and the AERIAL TRIMMER given in para. (a) applies.

The principle advantage of the crystal filter is its ability to eliminate heterodynes. Suppose, for instance, a signal has been carefully tuned and during transmission an interfering station causes a bad heterodyne, inverted speech etc., ordinarily the desired signal would be made unintelligible. Careful adjustment of the SELECTIVITY and/or PHASING controls will, in most cases, eliminate the heterodyne and the interfering station completely. The PHASING control will eliminate one signal only. If another interfering station comes on, however, only one heterodyne will be present, instead of several resulting from three station carriers beating together.

(c) C.W. Reception without Crystal Filter

Set the CRYSTAL switch at OUT, the facility switch at B.F.O. ON and the B.F.O. CONTROL at the centre of the bar marked on the panel.

It is suggested that the A.F. GAIN control be set in the maximum position and the sensitivity controlled by the R.F. GAIN control. If the R.F. GAIN control does not reduce a strong signal sufficiently, further reduction may be obtained by means of the A.F. GAIN control. The setting of the two gain controls is largely a matter of preference to be determined by the operator and by the receiving conditions prevailing. Tune for zero beat. A beat note produced between the received signal and the B.F.O. may be obtained by means of the B.F.O. CONTROL which will give a variation from 0 - 2,000~ on either side of the bar indicated on the panel.

(d) C.W. Reception with Crystal Filter

Set the CRYSTAL switch at IN, the SELECTIVITY control at MIN., the PHASING control to the square dot, the B.F.O. CONTROL at the centre of the bar marked on the panel and the facility switch at B.F.O. ON.

Tune the receiver as explained in para. (c) above, then set the SELECTIVITY control at MAX. Now as the receiver is tuned slowly across the carrier the beat note will be sharply peaked at one point. All other parts of the beat note will be weak, and furthermore, this peak will be found to occur on only one side of the carrier. Should a heterodyne be present from an interfering station it can be eliminated or greatly reduced by adjusting the PHASING control.

(e) Meter

(i) Signal Strength ("S") Indication

The "S" scale of the meter serves to indicate the strength of a received signal. It is calibrated from 1 to 9 in arbitrary units which correspond, roughly, to the definition of the nine points of the "S" scale of the R.S.T. system of signal reports.

Fig. 4 shows the relation between the average meter readings and the actual signal input to the receiver in microvolts and from this curve it will be noted that each "S" unit is equal to a change of approximately 4db. The 40db range above the S9 level is used for comparative checks on extremely strong signals.

Before making a measurement on a signal the following must be made:

(1) Set the facility switch to A.V.C. OFF and the selectivity control at MIN.

(2) Advance the R.F. GAIN control fully clockwise (0) and switch the meter switch to "S" The meter should then read zero.

(3) If the meter does not read zero, disconnect the aerial and detune the receiver. Then, using a screwdriver, adjust the control which is located on the chassis near the aerial terminals (see Fig. 1) until this condition is obtained.

The receiver is now adjusted and the strength of any signal may be measured by switching to A.V.C. ON and tuning for maximum meter deflection. The A.F. GAIN control does not influence the meter reading, thus output may be controlled by this means.

(ii) Audio Output Indication

The audio output scale of the meter serves to indicate the audio output of the receiver across the 600 ohms line. It is calibrated from 0-50 milliwatts with a multiplier which may be selected by the meter switch enabling outputs up to 5 watts to be measured. For readings of greatest accuracy the phone or line jacks must be terminated into 600 ohms.

CHAPTER III

TECHNICAL DESCRIPTION

3.1 Introduction

The receiver is of the superheterodyne type using an intermediate frequency of 455kc., the frequency of the local oscillator being higher than the signal frequency. Two R.F. stages and two I.F. stages of amplification are employed, these being followed by detector, audio amplifier and output stages. A second local oscillator is employed for use as a heterodyne for reception of C.W. signals.

An I.F. crystal filter is also used to increase the selectivity of the intermediate frequency amplifiers.

The frequency range is from 0.48 - 26 Mc. Covered in six bands. Namely:-

Band A:	14.3 - 26 Mc.
Band B:	7.0 - 14.6 Mc.
Band C:	3.6 - 7.3 Mc.
Band D:	1.85 - 3.9 Mc.
Band E:	0.9 - 1.9 Mc.
Band E:	0.48 - 1.0 Mc.

3.2 R.F. Amplifiers

The aerial transformer has its primary L1 inductively coupled to the secondary L2 which is the grid inductor of valve V1A. L2 is tuned by the tuning capacitor C18, which forms part of the 4-gang tuning capacitor assembly and the circuit is trimmed by the AERIAL TRIMMER C18A to enable various types of aerial to be used with the receiver.

The output via V1A is applied to the grid of valve V1B via the r-f transformer L3 - L4. L3 is a high impedance inductor resonant outside the low frequency end of the band and is inductively coupled to the grid inductor L4. Top Capacity coupling is also employed by means of the 4µµF capacitor C2. The grid inductor is tuned by means of the variable capacitor C23, which forms part of the 4-gang tuning capacitor assembly and is trimmed by adjusting capacitor C4 and fixed capacitor C4A.

The same method of coupling is employed between valves V1B and V2A, using r-f transformer L5 - L6; capacitor C28 is used for tuning and C7 and C7A for trimming the grid circuit of valve V2A.

In band A a series padding capacitor (C1, C3, and C6) is employed in all the r-f circuits to give a slight bandspread effect to facilitate tuning at these higher frequencies and magnetic cores are fitted for alignment purposes. Resistors R3 and R3 are connected across the anode inductors of the r-f stages in bands C and D to improve signal to noise ratio and also to give comparable sensitivity with the higher frequency bands. Similar results are obtained in bands E and F by the use of a low-impedance inductor in the plate circuit of the 2nd r-f valve V1B.

These two r-f valves are self-biased by resistors R6 and R9, respectively and receive a-v-c bias through resistors R5 and R8, which together with capacitors C20 and C24 provide individual de-coupling. In addition to the self-bias obtained by resistor R9, on valve V1B, a variable bias is provided by the R.F. GAIN control R10.

The screen grid voltage is obtained from the junction of resistors R20 and R21 which form a potential divider.

3.3 Local Oscillator

The oscillator valve V5A operates in a tuned feed-back circuit, at a frequency of 455 kc. higher than the signal frequency. The tuned circuit comprises inductor L7, capacitor C33 (part of the four-gang capacitor assembly) and capacitor C10, the padder capacitor. The tuned circuit is trimmed by adjustable capacitor C9 and fixed capacitor C33A. C33A is a temperature compensating capacitor, used to minimise frequency drift due to temperature variations. Resistor R1 and capacitor C8 provide decoupling for the anode circuit. Bias is obtained by means of the grid resistor R18 and capacitor C34.

3.4 Frequency Converter

The frequency converter valve V2A is a triode-heptode. The output from the oscillator is applied to the triode grid via capacitor C31, which is connected internally to the injector grid of the heptode section which acts as the mixer. The triode anode is connected to the cathode. The heptode anode is coupled to the control grid of the i-f amplifier valve V1C through the crystal filter circuit, which is tuned to a frequency of 455 kc.

Decoupling of the anode circuit is accomplished by means of R19 and capacitor C35.

Self-bias is obtained by resistor R15 and screen grid voltage is obtained through the dropping resistor R17.

3.5 Crystal Filter

The load impedance for the heptode anode of V2A is formed by the high-impedance primary L17 of the filter input transformer, which is tuned by the capacitor C36 and adjustable magnetic core. The secondary L18 is of relatively low-impedance and is centre-tapped to earth to provide a neutralising voltage 180° out of phase with the voltage fed to the crystal. C39 is the PHASING control and is employed to neutralise the capacitance of the crystal holder. In parallel with this control is a trimmer capacitor C38 to enable exact neutralisation to be obtained with the control set at the square dot on the panel.

The output of the crystal is fed to the grid of the first i-f amplifier valve V1C via capacitor C40 and i-f inductor L19. The grid circuit is tuned by means of fixed capacitor C41, variable capacitor C43 (SELECTIVITY control) and adjustable magnetic core. The function of the SELECTIVITY control is to enable various degrees of selectivity to be obtained when using the crystal. For broad bandwidth or minimum selectivity the control is set in the minimum capacitance position which tunes the circuit to exactly the same frequency of the crystal. As the capacitance is increased, so the selectivity is also increased. The adjustable magnetic core is provided to enable the circuit to be tuned to exact crystal frequency with the SELECTIVITY control set at the approximate position (MIN) on the dial.

3.6 I-F Amplifiers

The first i-f amplifier is an r-f pentode. The input circuit has already been described in sub-section 3.5. The output from this valve is fed to the grid of the 2nd i-f amplifier V1D via the i-f transformer L20-L21, both primary and secondary of which are tuned by fixed capacitors, C45 and C47, respectively. Adjustment is effected by adjustable magnetic cores. The input to valve V1D is taken from a tap on the secondary of the i-f transformer to reduce the signal to noise ratio and is also to minimise change in alignment when valves are replaced.

The same method of coupling is employed between valve V1D and the diodes on V3A using i-f transformer L22-L23 tuned by capacitor C50 and C54.

These two i-f valves are self-biased by resistors R23 and R25, respectively. In addition to the self-bias obtained by these resistors, a variable bias is provided by the R.F. GAIN control R10. A-V-C bias is applied to valve V1C through resistor R22 which, together with C42, provides decoupling and to V1D through resistor R35.

Decoupling of the anode circuits is accomplished by R24 and C46 and R26 and C51, respectively. Screen grid voltage is obtained from the same potential divider as for V1A and V1B.

3.7 Detector, AVC and A-F Stage

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

3.7.1 Signal Detector

The signal detector is directly connected to the "hot" side of the second i-f transformer secondary L23. The diode load is provided by resistors R27 and R28. As well as forming part of the diode load, R27 functions as an i-f filter in conjunction with filter capacitors C55 and C52.

The a-f component developed across resistor R28 also appears across resistor R31 (A.F. GAIN control), which is in parallel with the diode load through the coupling capacitor C56. The control grid of the pentode section is connected to the moving arm of this control, thus the voltage applied to the grid is dependent upon the setting of the control.

3.7.2 A-V-C Detector

The a-v-c diode is connected through capacitor C57 to the signal detector diode. The rectified voltage is developed across the diode load potentiometer formed by resistors R33 and R34. 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 valves V1A, V1B and V1C through decoupling resistors R36, R5, R8 and R22. Valve V1D obtains portion of this voltage by connecting the control grid to the junction of resistors R33 and R34 through decoupling resistor R35. The diode load potentiometer being connected to earth provides a delay voltage equal to the d-c volts developed across the cathode resistor R29 by the cathode current of V3A. Therefore, no rectification takes place in this diode until the strength of the incoming carrier is sufficient to overcome this bias, thus delaying the avc.

3.7.3 A-F Amplifier

The pentode section of V3A operates as an a-f amplifier. Resistor R37 forms the output impedance across which the a-f component is developed and applied to the control grid of the output valve V4A. Decoupling of the anode circuit is accomplished by means of resistor R38 and capacitor C64.

Screen grid voltage is obtained from the junction of resistors R30 and R32, which form a potential divider and self-bias is obtained by resistor R29.

3.8 Output Stage

V4A is a beam power tetrode output valve. The anode is coupled by the transformer T1 to the loudspeaker, headphones or 600 ohm line. Self-bias is obtained by resistor R40. The screen grid is connected directly to the high tension.

Inverse feedback is provided by means of resistor R39.

NOTE: Either headphones, line, or loudspeaker must be connected before switching on the set, otherwise damage to the output valve will result due to it operating in the unloaded condition.

3.9 Beat Frequency Oscillator

V5B is a triode and operates as a beat frequency oscillator in a circuit comprising capacitor C68 and inductors L24 and L25 tuned to a frequency of 455kc. Coupling to the i-f channel is obtained by connecting the anode of the oscillator to the a-v-c diode through capacitor C61.

The inductor L25 is closely coupled to the tuning inductor L24. Variable resistor R44 (B.F.O. CONTROL) is connected across this inductor and a variation of pitch in the beat note may be effected by varying this resistor.

For reception of a signal with the BFO on, the B.F.O. CONTROL should be set at the centre of the bar or null point marked on the panel. This setting insures that when a carrier is tuned to zero beat, the receiver is tuned to the centre of the carrier. The pitch of the beat note may now be adjusted up to a frequency of 2,000 cycles per second by moving the control either side of the null point.

Anode decoupling is accomplished by resistor R43 and capacitor C70. Bias is obtained by the grid resistor R45 and condenser C69.

3.10 Meter

3.10.1 Signal Strength

Signal strength may be measured with the meter switch set at S. The scale is calibrated in "S" units from 1 to 9 and db above S9. Fig. 3 shows the meter connected in the h-t supply circuit to the anodes of the i-f amplifier valves V1C and V1D. It is actually an indicator in a bridge circuit, the two arms of which are fixed resistors R11 and R13, the third an adjustable balancing resistor R12 and the fourth the anode circuit of the a-v-c controls i-f amplifier valves. The bridge is balanced by means of the resistor R12 with no signal input and the R.F. GAIN control set at maximum (0). When a signal is received, the a-v-c functions, applying bias to the i-f amplifier valves, upsetting the balance of the bridge circuit, and indicating on the meter.

3.10.2 Audio Output

Audio output may be measured with the meter switch on any of the MILLIWATTS positions (x100, x10, x1) provided the phone or line jacks are terminated into 600 ohms. A false indication will be obtained if the jacks are incorrectly terminated. The output scale is calibrated in milliwatts and db with 6 milliwatts as reference level. The meter network is connected across the phone or line jacks from which the audio voltage is applied to an instrument type rectifier W1. The d-c voltages from the rectifier is measured by the meter. The required ranges are obtained by means of the resistors which are in series with the input circuit of the rectifier. The resistors and their respective ranges are as follows:-

Range x100 - R54 and R55 in series
Range x10 - R53
Range x1 - R51 and R52 in series

3.11 Universal Power Unit, Type 4H13501

All components in the universal power unit are mounted on a chassis which is insulated from the case. Full-wave rectification is employed using two 6X5GT type valves (V6A and V6B) each having their anodes bridged. The valve heaters are connected in series and the cathodes in parallel. The h-t secondary of T2 has its centre tap connected through fuse F3 and a filter circuit comprising choke L30 and capacitors C74 and C79 to contact 3 on the output socket. In the receiver this circuit is connected to chassis by the facility switch S2 in all positions excepting H.T. OFF when the circuit is opened by section 3 of this switch, thus removing ht from the receiver. The high tension is taken from the cathodes of the rectifier and is fed through a filter circuit comprising chokes L26, L27, L28, and capacitors C71, C72, C73 and C75 to contact 2 on the output socket.

With the AC-DC switch S6 in the A.C. MAINS position, switch S4 switches both input leads, whilst, in the DC 12 volts position, S4 switches the positive (+) battery input lead. Mechanical interlocking is provided between these two switches to ensure that S6 can be switched from A.C. MAINS to D.C. VOLTS and vice versa only when the ON-OFF switch S4 is at OFF. Condensers C84 and C85 filter the a-c primary circuit.

3.11.1 A-C Operation

With switch S6 in the A.C. MAINS position the power unit may be operated on 240V or 110V a-c mains according to the setting of switch S3 as shown on the indicator on the front panel.

For 240 volt ac operation the primary windings A and B of transformer T2 are connected in series, A being a 130 volt winding and B a 110 volt winding. For 110 volts a-c operation connection is made to a 110 volt tap on winding A and the winding is connected in parallel with winding B. A 3 amp. Fuse F2 inserted in one primary lead protects the unit. A 12 volt secondary winding E on T2 feeds the valve heaters.

3.11.2 Battery Operation

The negative pole of the battery is connected to the chassis inside the unit. The input voltage is filtered by choke L34 and capacitors C87 and C86, then controlled by switches S6 and S4.

(a) Through a filter circuit comprising choke L29 and capacitors C88, C83 and C89, then through fuse F1 to the centre tap of primary winding C on transformer T2;

(b) through a filter circuit comprising chokes L29 and L33 and capacitors C82, C83, C88 and C89 to the driving contact of the non-synchronous vibrator;

(c) to heaters of V6A and V6B and contact 1 on the output plug to provide heater voltage for the receiver, being by-passed at this point by capacitor C76.

Resistors R48 and R49 and capacitors C77 and C76 form the buffer circuit for vibrator operation.

The primary winding C of transformer T2 is connected to the primary contacts of the vibrator through filter circuits comprising choke L31 and L32 and capacitors C80 and C81.

CHAPTER IV

ALIGNMENT PROCEDURE AND SERVICE DATA

4.1 General

4.1.1 Manufacturer's Setting of Adjustments

The receiver is tested by the manufacturer with precision instruments and all adjustments locked and sealed. Re-alignment should be necessary only when components in certain circuits have required replacement or repair. However, it should not be assumed that re-alignment is required because a component, except in a tuned circuit, has been replaced. First, check the performance of the receiver and if it is below normal, re-alignment will be necessary.

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 necessary, the seal covering the adjusting screws must be broken and the locking nut loosened, using the tool supplied for the purpose.

Under no circumstance should the plates of the 4- gang tuning assembly comprising C18, C28, and C33 be adjusted. This assembly is aligned by the manufacturer and cannot be re-adjusted without precision instruments.

4.2.2 Setting of Controls

In all operations in this chapter the receiver controls should be in the following positions, unless otherwise stated.

Facility Switch	A.V.C. OFF
A.F. GAIN	Maximum clockwise
R.F. GAIN	Maximum clockwise
CRYSTAL switch	OUT
SELECTIVITY control	MIN
PHASING control	At square dot on panel
B.F.O. control	At null point or bar on panel
AERIAL TRIMMER	Adjusted for maximum output at each test frequency

4.2 Testing Instruments

Recommended instruments for use in the alignment of the receiver are as follows:-

4.2.1 Standard Signal Generator

Frequency Range	-	400 kc. to 26 Mc.
Output Range	-	1 microvolt to 1 volt
Internal Modulation	-	30 per cent at 400~

4.2.2 Dummy Aerial

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

4.2.3 Output Meter

This instrument should have impedance of 3.7, 600 and 5,000 ohms and a range of 5-1000 milliwatts. The audio output meter on the receiver may be used for this purpose provided the phone or line jacks are terminated.

4.2.4 D-C Micro-ammeter

This instrument should have a range of 0-50 or 0-100 micro-amps.

4.2.5 Aligning Tools

Tools designed to facilitate alignment are supplied with the equipment and these are:-

(i) Insulated Screwdriver - Part No. 13776

This tool is used fir adjusting the i-f transformer and tuning inductor cores, and PHASING control trimmer.

(ii) Locking Tool - Part No. 13779

Locking nuts are fitted to all i-f transformer tuning-inductor and trimmer-capacitor adjustments. The locking tool supplied is especially constructed for the purpose.

4.3 I-F Alignment

(i) Connect loudspeaker to socket S02 or headphones to jacks J1 or J2. Plug in band E or band F coil unit and set dial at 0.

(ii) Disconnect the grid clip to the control grid of valve V2A and connect the active lead of the Standard Signal Generator in its place and the earth lead to the receiver chassis.

(ii) Remove the crystal from the receiver and plug it into an external oscillator. Loosely couple the output from the oscillator to the control grid of valve V2A. Increase the unmodulated input from the Standard Signal Generator and tune until a beat note is heard in the receiver headphones or loudspeaker. When the Standard Signal Generator is adjusted to zero beat with the crystal oscillator, it is tuned to the same frequency as the crystal supplied.

NOTE: The use of an external oscillator will only be necessary when the i-f transformers are badly out of alignment. If the adjustments are not far out the following procedure may be adopted.

Switch facility switch to B.F.O. ON. Set selectivity CONTROL TO max. and CRYSTAL switch to IN. Switch modulation on the Standard Signal Generator off and as the generator is tuned, a peak in the audio beat note will be heard on one side of the resonance. The frequency at which this note is heard will be the crystal frequency.

(iv) Replace the crystal in the receiver and remove the coupling from the crystal oscillator. Switch HT off, remove loudspeaker or headphones and connect the output meter to either of the following:-

Phone or line jack J1 Or J2	-	600 ohms impedance
Loudspeaker socket S02	-	3.7 ohms impedance

Across primary of output
Transformer - 5,000 ohms impedance

Note: It is important that the Output Meter be connected to one of these positions and set at the correct impedance before switching on the HT, otherwise damage to the output valve may result. The audio output meter on the receiver may be used as an alternative but it is important that the phone or line jacks be correctly terminated.

(v) Switch on modulation of Standard Signal Generator, 30% at 400~ and adjust input to give an Output Meter reading of approximately 50 milliwatts.

(vi) Using the insulated screwdriver supplied, adjust the magnetic cores within L23 and L21 for maximum peak output.

(vii) Reverse the chassis and adjust the cores within L22, L20 and L17 for maximum peak output.

(viii) Repeat adjustments (vi) and (vii).

(ix) Switch facility switch to B.F.O. ON and the modulation of the Standard Signal Generator off. Adjust magnetic core in b-f-o inductor L24 until zero beat is obtained.

4.4 Crystal Filter Alignment

(i) Disconnect end of resistor R28, which is connected to V3A cathode, from panel and connect DC micro-ammeter between this resistor and the cathode. Switch CRYSTAL switch to IN.

(ii) With the modulation switched off, set the Standard Signal Generator at a frequency of approximately 445 or 465 kc. and adjust input until a reading of approximately 10 or 20 micro-amp. is obtained.

(iii) Using the insulated screwdriver supplied, adjust trimmer capacitor C38 until a minimum reading is obtained on the micro-ammeter. As the condition for minimum output is obtained it may be necessary to increase the input from the Standard Signal Generator, or to change the frequency slightly towards 455 kc.

(iv) Reset the Standard Signal Generator to 455 kc. and adjust the input until a reading of approximately 20 micro-amps. is obtained.

(v) With the insulated screwdriver, adjust magnetic core within L19, while varying the tuning of the Standard Signal Generator through a frequency of approximately 454 to 456 kc. until a minimum reading is obtained on the micro-ammeter. At this minimum reading point it will be found that the output remains substantially constant between these frequencies.

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

(vii) To ensure that this alignment is correct a check should be made on the bandwidth at 6.0 db. This should be approximately 4 kc. and symmetrical to within 1 kc. Set SELECTIVITY control to MIN and check bandwidth at 6.0 db. It should be approximately 400~.

(viii) Disconnect Standard Signal Generator from V2A grid, replace grid connector, remove the micro-ammeter from the diode circuit and reconnect resistor R28 in place.

4.5 R-F Alignment

(i) Connect active lead from Standard Dummy Aerial to aerial terminal A1. Connect other side of Standard Dummy Aerial to receiver chassis. Connect terminal A2 to chassis using the pigtail and clip provided.

(ii) Plug-in Band A tuning coli unit. Set Standard Signal Generator, modulated 30% at 400∿, at 24 Mc. Tune receiver to give maximum output at this frequency. If calibration is correct, adjust trimmer capacitor C9, which is located at right hand end of coil unit on top of the chassis, until the frequency corresponds to the dial reading as shown on the curve of the coil unit.

(iii) Adjust trimmer capacitors C7 and C4, second and third trimmers from right hand end, in turn, for maximum output while rocking the tuning dial back and forth through the signal.

Care must be taken in alignment at this point to ensure that the receiver is aligned to the correct frequency and not the image frequency.

(iv) Set the Standard Signal Generator at 14.0 Mc. And tune the receiver for maximum output at this frequency.

If calibration is incorrect it may be corrected by the magnetic core in the oscillator inductor L7, which is located underneath the chassis at the right hand rear of the coil unit.

(v) Adjust magnetic cores in r-f inductors L4 and L6 in turn, which are adjacent to the adjustment for L7, until maximum output is obtained.

(vi) Repeat adjustments (iii), (iv) and (v).

(vii) Align bands B, C, D, E, and F in a similar manner at the following frequencies, but in the case of these bands, core adjustments are not provided for the r-f transformers.

Band B:	14.2	and	7.3	Mc.
Band C:	7.1	and	3.7	Mc.
Band D:	3.8	and	1.9	Mc.
Band E:	1.85	and	0.94	Mc.
Band E:	0.98	and	0.5	Mc.

When the receiver has been satisfactorily aligned, lock all adjustments, using the tool provided.

4.6 Removal of Crystal

The crystal is mounted in sockets on top of the Crystal Filter Unit. To remove the crystal, loosen screw A shown in Plate 4 and slide off cover towards the rear of the chassis. The crystal will now be fully revealed and may be withdrawn towards the front panel.

4.7 Volume Control

The A.F. GAIN control is a 1 megohm attenuator with 28 contacts. Fig. 5 is a schematic diagram of the component showing the resistance values between the contacts. Resistors are all A.R.C. type BT1/2.

Should the contact surfaces require cleaning, unscrew the cover and wipe the contacts with a clean piece of lintless cloth. The rotor should be cleaned carefully passing a piece of the cloth, singly, between it and the contacts.

After cleaning, the contacts should be sparingly smeared with pure petroleum jelly.

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

TABLE I

SCHEDULE OF EQUIPMENT
AMR-101 INSTALLATION

Item No.	Item	Receiver-Power Unit Case	Accessories Case	Total
1	Communication Receiver type AMR-101	1		1
	(AWA Type 3C13500)			
2	VALVES			
2-1	6U7G Radiotron	4☆	4	8
2-2	6J8G Radiotron	1☆	1	2
2-3	6J5GT Radiotron	2☆	2	4
2-4	6G8G Radiotron	1☆	1	2
2-5	6V6G Radiotron	1☆	1	2
2-6	6X5GT Radiotron	2+	2	4
3	COIL UNITS			
	Band A: 14.3 - 26.0 Mc.			
	Band B: 7.0 - 14.6 Mc.	1☆		1
	Band C: 3.6 - 7.3 Mc.	1++		1
	Band D: 1.85 - 3.9 Mc.	1++		1
	Band E: 0.9 - 1.9 Mc.	1++		1
	Band E: 0.48 - 1.0 Mc.	1++		1
		1++		1
	Universal Power Unit (AWA type 4H13501)			
4		1		1
	FUSES			
5				
	Cartridge, 10 amp.			
5-1	Cartridge, 3 amp.	3☆☆	6	9
5-2	Cartridge, 250 mA	3☆☆	6	9
5-3		3☆☆	6	9

TABLE 1 (CONTD.)

Item No.	Item	Receiver-Power Unit Case	Accessories Case	Total
6	Fuse Holder Cap, No. 11691		1	1
7	Loudspeaker, type D13503		1	1
8	Headphones (2,000 Ω impedance) fitted with telephone plug No. 10		2	2
9	CONNECTORS			
9-1	Battery, twin, No. 13222		1	1
9-2	A.C. Mains, twin, No. 13225		1	1
9-3	Battery Link, No. 4021B2/31		1	1
10	Lamps, Dial, 6-8V, 0.25A	1☆	6	7
11	Vibrator, Oak type V5123, 12V non-sychronous	1+	1	2
12	Instruction Book	1		1
13	ALIGNMENT TOOLS			
13-1	Insulated Screwdriver, No. 13776		1	
13-2	Locking Tool, No. 13779		1	

☆ Fitted in item 1
\+ Fitted in item 4
☆☆ In item 4 one fitted, two as spares
++ Stowed in carrying case

TABLE II - WEIGHTS AND DIMENSIONS

Arrangement	Weight lb.	Length ins.	Width ins.	Depth ins.
AMR-101 Receiver complete with valves	40 ¼	19 ☆	8 23/32 ☆	10
4H13501 Power Unit with valves	32	19 ☆	8 23/32	10
D13503 Loudspeaker Unit	7 ¼	8	8	4 ½
Receiver-Power Unit Case with equipment installed	169 ¼	28 ¼	21 ½	15 3/8
Accessories Case with equipment installed	42 ¾	21 ½	12 ¾	8 ¼

☆ Dimension of front panel only

TABLE III - SENSITIVITY MEASUREMENTS

Measurements taken with controls set in positions described in Chapter IV, para. 4.1.2

Description of Test	Connect Input to	Input Voltage	Band	Frequency	Output	Remarks
A-F Gain	Grid V3A (6G8G)	5mV		400 ~	50 mW	Sensitivity taken with Band E coil unit and dial set at 0
I-F Gain	Grid V1D (6U7G)	4,000 µV		455 KC.	50 mW	
I-F Gain	Grid V1C (6U7G)	120 µV		455 KC.	50 mW	
I-F Gain	Grid V2A (6J8G0	30 µV	E	455 KC.	50 mW	
R-F Gain	Grid V2A (6J8G)	40 µV	A	24.0 Mc.	50 mW	
R-F Gain	Grid V2A (6J8G)	45 µV	A	14.8 Mc.	50 mW	
R-F Gain	Grid V2A (6J8G)	40 µV	B	14.2 Mc.	50 mW	
R-F Gain	Grid V2A (6J8G)	40 µV	B	7.3 Mc.	50 mW	
R-F Gain	Grid V2A (6J8G)	40 µV	C	7.1 Mc.	50 mW	
R-F Gain	Grid V2A (6J8G)	40 µV	C	3.7 Mc.	50 mW	
R-F Gain	Grid V2A (6J8G)	40 µV	D	3.8 Mc.	50 mW	
R-F Gain	Grid V2A (6J8G)	40 µV	D	1.9 Mc.	50 mW	
R-F Gain	Grid V2A (6J8G)	40 µV	E	1.85 Mc.	50 mW	
R-F Gain	Grid V2A (6J8G)	40 µV	E	0.94 Mc.	50 mW	
R-F Gain	Grid V2A (6J8G)	40 µV	F	0.98 Mc.	50 mW	
R-F Gain	Grid V2A (6J8G)	40 µV	F	0.5 Mc.	50 mW	
R-F Gain	Grid V1B (6U7G)	15 µV	A	24.0 Mc.	50 mW	
R-F Gain	Grid V1B (6U7G)	10 µV	A	14.8 Mc.	50 mW	
R-F Gain	Grid V1B (6U7G)	9 µV	B	14.2 Mc.	50 mW	
R-F Gain	Grid V1B (6U7G)	5 µV	B	7.3 Mc.	50 mW	
R-F Gain	Grid V1B (6U7G)	5 µV	C	7.1 Mc.	50 mW	
R-F Gain	Grid V1B (6U7G)	5 µV	C	3.7 Mc.	50 mW	
R-F Gain	Grid V1B (6U7G)	5 µV	D	3.8 Mc.	50 mW	
R-F Gain	Grid V1B (6U7G)	5 µV	D	1.9 Mc.	50 mW	
R-F Gain	Grid V1B (6U7G)	40 µV	E	1.85 Mc.	50 mW	
R-F Gain	Grid V1B (6U7G)	40 µV	E	0.94 Mc.	50 mW	
R-F Gain	Grid V1B (6U7G)	40 µV	F	0.98 Mc.	50 mW	
R-F Gain	Grid V1B (6U7G)	40 µV	F	0.5 Mc.	50 mW	

TABLE III (Contd.)

Description of Test	Connect Input to	Input Voltage	Band	Frequency	Output	Remarks
R-F Gain	Grid V1A (6U7G)	3 µV	A	24.0 Mc.	50 mW)	
R-F Gain	Grid V1A (6U7G)	3 µV	A	14.8 Mc.	50 mW)	
R-F Gain	Grid V1A (6U7G)	3 µV	B	14.2 Mc.	50 mW)	
R-F Gain	Grid V1A (6U7G)	3 µV	B	7.3 Mc.	50 mW)	
R-F Gain	Grid V1A (6U7G)	3 µV	C	7.1 Mc.	50 mW)	
R-F Gain	Grid V1A (6U7G)	3 µV	C	3.7 Mc.	50 mW)	Sensitivity for 2 - 1
R-F Gain	Grid V1A (6U7G)	3 µV	D	3.8 Mc.	50 mW)	Signal to noise ratio
R-F Gain	Grid V1A (6U7G)	3 µV	D	1.9 Mc.	50 mW)	
R-F Gain	Grid V1A (6U7G)	3 µV	E	1.85 Mc.	50 mW)	
R-F Gain	Grid V1A (6U7G)	3 µV	E	0.94 Mc.	50 mW)	
R-F Gain	Grid V1A (6U7G)	3 µV	F	0.98 Mc.	50 mW)	
R-F Gain	Grid V1A (6U7G)	3 µV	F	1.0 Mc.	50 mW)	

Output measurements taken with a resistive load
Of 5,000 ohms across primary of output transformer
Or 600 ohms across phone jacks

TABLE IV - SOCKET VOLTAGES AND CURRENTS

Valve Code	Valve Type	Function	Anode to Chassis Volts	Screen Grid To Chassis Volts	Cathode to Chassis Volts	Anode Current mA	Screen Current mA	Remarks
V1A	6U7G	1st R.F. Amp.	255	95	2.7	7.0	1.5	
V1B	6U7G	2nd R.F. Amp.	255	95	2.7	7.0	1.5	
V2A	6J8G	Converter	260	85	1.5	1.5	2.7	
V5A	6J5GT	Oscillator	140	-	-	A-6.0 B-6.0 C-4.0 D-4.0 E-3.0 F-3.0	-	
V1C	6U7G	1st I-F Amp.	255	95	3.5	5.0	1.3	
V1D	6U7G	2nd I.F. Amp.	255	95	3.5	5.0	1.3	Screen and Anode Voltages
V3A	6G8G	Detector, A.V.C. And A.F. Amp.	85	30	1.8	0.6	0.16	as measured with 1,000 ohm per volt meter 1,000V range
V4A	6V6G	Output	255	280	13.0	45.0	4.0	
V5B	6J5GT	B.F.O.	110	-	-	3.0	-	Facility switch at B.F.O. ON

Measurements taken with receiver operating on 240V ac with no signal input and controls set in the following positions:- A.F. GAIN control at 0; R.F. GAIN control at 0; Tuning Dial at 0; Facility switch at A.V.C. OFF.

APPENDIX 1 - CIRCUIT CODE

Circ. Ref. No.	Description	Assoc. With Valve	Plate	Location	Type, Rating and Remarks	Manufacturer		AWA Type Or Ref. No.
						Name	Design.	
	Capacitors							
C1	Series Padder	V1A	-	Band A Aerial Coil Unit	480 µµF, Silvered Mica, ±2½%	Simplex	SMX	
C2	Capacity Coupling	V1B	-	Band A 1st R.F. Coil Unit	4 µµF, mica	A.W.A.		224,233
C3	Series Padder	V1B	-	Band A 1st R.F. Coil Unit	480 µµF, Silvered Mica, ±2½%	Simplex	SMX	
C4	Trimmer	V1B	-	Band A 1st R.F. Coil Unit	3-25 µµF, air variable	A.W.A.		13901
C4A	Trimmer Shunt	V1B	-	Band A 1st R.F. Coil Unit	14 µµF, mica	A.W.A.		13211☆
C5	Capacity Coupling	V2A	-	Band A 2nd R.F. Coil Unit	4 µµF, mica	A.W.A.		224,233
C6	Series Padder	V2A	-	Band A 2nd R.F. Coil Unit	480 µµF, Silvered Mica, ±2½%	Simplex	SMX	
C7	Trimmer	V2A	-	Band A 2nd R.F. Coil Unit	3-25 µµF, air variable	A.W.A.		13211☆
C7A	Trimmer Shunt	V2A	-	Band A 2nd R.F. Coil Unit	14 µµF, mica	A.W.A.		13901
C8	Anode Decoupling	V5A	-	Band A Osc. Coil Unit	0.01 µF, mica	A.W.A.		224,801
C9	Trimmer	V5A	-	Band A Osc. Coil Unit	3-25 µµF, air variable	A.W.A.		13901
C10	Series Padder	V5A	-	Band A Osc. Coil Unit	400 µµF, Silvered Mica, ±2½% viz. 1-200 µµF, silvered mica, ±2½% 1-200 µµF, N7509 silver ceramic	 Simplex Ducon Or Erie	 SMX	226,067
C11	Capacity Coupling	V1B	-	Bands B-F 1st RF Coil Unit	4 µµF, mica	A.W.A.		224,233
C12	Trimmer	V1B	-	Bands B-F 1st RF Coil Unit	3-25 µµF, air variable	A.W.A.		13901
C12a	Trimmer Shunt	V1B	-	Bands B-F 1st RF Coil Unit	9 µµF, mica	A.W.A.		13211☆
C13	Capacity Coupling	V2A	-	Bands B-D 2nd RF Coil Unit	4 µµF, mica	A.W.A.		224,233
C14	Trimmer	V2A	-	Bands B-F 2nd RF Coil Unit	3-25 µµF, air variable	A.W.A.		13901
C14A	Trimmer Shunt	V2A	-	Bands B-F 2nd RF Coil Unit	9 µµF, mica	A.W.A.		13211☆
C15	Anode Decoupling	V5A	-	Bands B-F Osc. Coil Unit	0.01 µµF	A.W.A.		224,801
C16	Trimmer	V5A	-	Bands B-F Osc. Coil Unit	3-25 µµF, air variable	A.W.A.		13901
C16A	Trimmer Shunt	V5A	-	Band F Osc. Coil Unit	14 µµF, mica	A.W.A.		13211☆
C17	Series Padder	V5A	-	Band B Osc. Coil Unit	3,000 µµF, mica, ±2½%	A.W.A.		13213☆
C17	Series Padder	V5A	-	Band C Osc. Coil Unit	2,000 µµF, mica, ±2½%	A.W.A.		13213☆
C17	Series Padder	V5A	-	Band D Osc. Coil Unit	1,200 µµF, mica, ±2½%	A.W.A.		13212☆

APPENDIX 1 (Contd.)

Circ. Ref. No.	Description	Assoc. With Valve	Plate	Location	Type, Rating and Remarks	Manufacturer Name	Manufacturer Design.	AWA Type Or Ref. No.
C17	Series Padder	V5A	-	Band E Osc. Coil Unit	600 µµF, mica, ±2½%	A.W.A.		13212☆
C17	Series Padder	V5A	-	Band F Osc. Coil Unit	400 µµF, mica, ±2½%	A.W.A.		13212☆
C18	Input Tuning	V1A	3	J3	19-245 µµF, Ganged Tuning Capacitor	A.W.A.		U13504
C18A	AERIAL TRIMMER	V1A	3	J2	4-40 µµF, air variable	A.W.A.		13649
C19	Grid Decoupling	V1A	4	D4	0.05 µF, paper, 350V working	A.W.A.		228,115
C20	Cathode By-pass	V1A	4	D6	0.1 µF, paper, 350V working	A.W.A.		228,121
C21	Screen Grid By-pass	V1A	4	E6	0.1 µF, paper, 350V working	A.W.A.		228,121
C22	Anode Decoupling	V1A	4	G5	0.1 µF, paper, 350V working	A.W.A.		228,121
C23	Input Tuning	V1B	3	H3	19-245 µµF, ganged tuning capacitor	A.W.A.		U13504
C24	Grid Decoupling	V1B	4	F4	0.05 µF, paper, 350V working	A.W.A		228,115
C25	Cathode By-pass	V1B	4	F6	0.1 µF, paper, 350V working	A.W.A.		228,121
C26	R.F. Gain Control By-pass	-	4	M7	25 µF, 40 volt electrolytic	Ducon	ET10769	222,912
C27	Anode Decoupling	V1B	4	G5	0.1 µF, paper, 350V working	A.W.A.		228,121
C28	Input Tuning	V2A	3	F3	19-245 µµF, ganged tuning capacitor	A.W.A.		U13504
C29	Cathode By-pass	V2A	4	H6	0.1 µF, paper, 350V working	A.W.A		228,121
C30	Screen Grid By-pass	V2A	4	H4	0.1 µF, paper, 350V working	A.W.A.		228,121
C31	Oscillator Coupling	V5A-V2A	4	H5	6 µµF, N750 silver ceramic	Ducon		220,437
C32	H.T. By-pass	-	4	F5	0.01 µF, mica, tuning	A.W.A.		224,801
C33	Oscillator Tuning	V5A	3	D3	19-245 µµF, ganged tuning capacitor	A.W.A.		U13504
C33A	Trimmer Shunt	V5A	3	D5	12 µµF, N750 silver ceramic	Ducon		220,443
C34	Grid	V5A	4	K4	80 µµF, silvered mica	Simplex	SMX	226,159
C35	Anode Decoupling	V2A	4	K3	0.1 µF, paper, 350V working	A.W.A.		228,121
C36	IF Filter Input Pri.Tuning	V2A	3	B3	50 µµF, silvered mica	Simplex	SMX	225,155
C37	h.t. By-pass	-	4	F6	0.1 µF, paper, 350V working	A.W.A.		228,121
C38	Phasing Control Trimmer	-	3&4	B3 AND L2	3-30 µµF, air variable	A.W.A		13012
C39	Phasing Control	-	3	B2	3-9 µµF, air variable	A.W.A.		13903

APPENDIX 1 (CONTD.)

Circ. Ref. No.	Description	Assoc. With Valve	Plate	Location	Type, Rating and Remarks	Manufacturer		AWA Type Or Ref. No.
						Name	Design.	
C40	Crystal Filter Output Coupling	-	3	B3	800 µµF, silvered mica	Simplex	SMX	226,159
C41	Crystal Filter Output Tuning	V1C	3	B3	50 µµF, silvered mica	Simplex	SMX	226,155
C42	Grid Decoupling	V1C	3	B3	0.05 µF, paper, 350V working	A.W.A.		228,115
C43	Selectivity Control	V1C	3	B2	3.5-17 µµF, air variable	A.W.A.		13902
C44	Cathode By-pass	V1C	4	M4	0.1 µF, paper, 350V working	A.W.A.		228,121
C45	1st I.F. Transfmr. Prim. Tuning	V1C	3	B7	250 µµF, silvered mica	Simplex	SMX	226,169
C46	Anode Decoupling	V1C	4	L6	0.1 µF, paper, 350V working	A.W.A.		228,121
C47	1st I.F. Transfmr. Sec. Tuning	V1D	3	B6	250 µµF, silvered mica	Simplex		225,169
C48	Cathode By-pass	V1D	4	K7	0.1 µF, paper, 350V working	A.W.A.		228,121
C49	Screen Grid By-pass	V1D	4	K6	0.1 µF, paper, 350V working	A.W.A.		228,121
C50	2nd I.F. Transfmr. Prim. Tuning	V1D	3	F7	250 µµF, silvered mica	Simplex	SMX	226,169
C51	Anode Decoupling	V1D	4	H6	0.1 µF, paper, 350V working	A.W.A.		228,121
C52	Signal Diode Filter	V3A	4	H7	100 µµF, mica	A.W.A.		224,261
C53	Cathode By-pass	V3A	4	F6	25 µF, 40 volt, electrolytic	Ducon	ET10769	222,912
C54	2nd I.F. Transfmr. Sec. Tuning	V3A	3	F7	250 µµF, silvered mica	Simplex	SMX	226,169
C55	Signal Diode Filter	V3A	4	R7	100 µµF, mica	A.W.A.		224,261
C56	Signal Diode Coupling	V3A	4	G8	0.01 µF, paper, 700V working	A.W.A.		228,301
C57	A.V.C. Diode Coupling	V3A	4	F7	50 µµF, mica	A.W.A.		224,255
C58	Screen Grid By-pass	V3A	4	J8	0.1 µF, paper, 350V working	A.W.A.		228,121
C59	Grid Decoupling	V1D	4	L7	0.05 µµF, paper, 350V working	A.W.A.		228,115
C60	Anode By-pass	V3A	4	F7	500 µµF, mica	A.W.A.		224,275
C61	B.F.O. Coupling	V5B	4	B7	2 µµF, mica (2-4 µµF in series)	A.W.A.		224,233
C62	A.V.C. Coupling	-	4	G8	0.05 µF, paper,350V working	A.W.A.		228,115
C63	Output Coupling	V3A	4	E8	0.01 µF, paper, 700V working	A.W.A.		228,301

APPENDIX 1 (Contd.)

Circ. Ref. No.	Description	Assoc. With Valve	Plate	Location	Type, Rating and Remarks	Manufacturer Name	Manufacturer Design.	AWA Type Or Ref. No.
C64	Anode Decoupling	V3A	4	E8	0.1 µF, paper, 350V working	A.W.A		228,121
C65	Anode By-pass	V4A	4	C7	0.02 µF, paper, 700v working	A.W.A		228,307
C66	Cathode By-pass	V4A	4	C6	25 µF, 40 volt, electrolytic	Ducon	ET10769	222,912
C67	H.T. By-pass	-	4	A7	0.1 µF, paper, 350V working	A.W.A		228,121
C68	B.F.O. Tuning	V5B	4	B6	750 µµF, silvered mica	Simplex	SMX ☆	
C69	Grid	V5B	4	B6	250 µµF, silvered mica	Simplex	SMX	226,169
C70	Anode Decoupling	V5B	4	A7	0.1 µF, paper, 350V working	A.W.A		228,121
C71	Filter	-	5		24 µF, 600PV, electrolytic	Ducon	EE10594	222,820
C72	H.T. + R.F. By-pass	-	6		0.1 µF, paper, 350V working	A.W.A		228,121
C73	Filter	-	5		24 µF, 600PV, electrolytic	Ducon	EE10594	222,820
C74	H.T. - R.F. By-pass	-	6		0.5 µF, paper, 350V working	A.W.A		228,135
C75	Filter	-	5		24 µF, 600PV, electrolytic	Ducon	EE10594	222,820
C76	Heater Supply R.F. By-pass	-	6		0.1 µF, paper, 350V working	A.W.A		228,121
C77	Buffer	-	6		0.03 µF, paper, 700V working	A.W.A		228,311
C78	Buffer	-	6		0.03 µF, paper, 700V working	A.W.A		228,311
C79	H.T. - R.F. By-pass	-	6		5,000 µµF, mica	A.W.A		224,295
C80	Vibrator-Prim. R.F. By-pass	-	6		0.1 µF, paper, 350V working	A.W.A		228,121
C81	Vibrator-Prim. R.F. By-pass	-	6		0.1 µF, paper, 350V working	A.W.A		228,121
C82	Vibrator-Coil R.F. By-pass	-	6		0.5 µF, paper, 350V working	A.W.A		228,135
C83	Vibrator-Coil R.F. By-pass	-	6		0.1 µF, paper, 350V working	A.W.A		228,121
C84	Mains Filter	-	6		0.02 µF, paper, 700v working	A.W.A		228,307
C85	Mains Filter	-	6		0.02 µF, paper, 700v working	A.W.A		228,307
C86	L.T. Supply R.F. By-pass	-	6		0.1 µF, paper, 350V working	A.W.A		228,121
C87	L.T. Supply R.F. By-pass	-	6		0.5 µF, paper, 350V working	A.W.A		228,135

☆ Capacitance of capacitor as well as type No. must be specified

APPENDIX 1 (Contd.)

Circ. Ref. No.	Description	Assoc. With Valve	Plate	Location	Type, Rating and Remarks	Manufacturer		AWA Type Or Ref. No.
						Name	Design.	
C88	Filter	-	5		100 μF, 40PV, electrolytic	Ducon	EE10720	
C89	Filter	-	5		100 μF, 40PV, electrolytic	Ducon	EE10720	
	Resistors							
R1	Anode Decoupling	V5A	7	Band A, Osc. Coil Unit	20,000 Ω, 1W	I.R.C.	BT1	600,707
R2	Anode Inductor Shunt	V1A	7	Band C, 1st R.F. Coil Unit	16,000 Ω, 1W	I.R.C.	BT1	600,705
R2	Anode Inductor Shunt	V1A	7	Band D, 1st R.F. Coil Unit	8,000 Ω, 1W	I.R.C.	BT1	600,699
R3	Anode Inductor Shunt	V1B	7	Band C, 2nd R.F. Coil Unit	16,000 Ω, 1W	I.R.C.	BT1	600,705
R3	Anode Inductor Shunt	V1B	7	Band D, 2nd R.F. Coil Unit	8,000 Ω, 1W	I.R.C.	BT1	600,699
R4	Anode Decoupling	V5A	7	Band B, Osc. Coil Unit	20,000 Ω, 1W	I.R.C.	BT1	600,707
R4	Anode Decoupling	V5A	7	Bands C & D, Osc. Coil Unit	32,000 Ω, 1W	I.R.C.	BT1	600,711
R4	Anode Decoupling	V5A	7	Bands E & F, Osc. Coil Unit	40,000 Ω, 1W	I.R.C.	BT1	600,713
R5	Grid Decoupling	V1A	4	E4	0.1 MΩ, 1/2W	I.R.C.	BT1/2	
R6	Cathode Bias	V1A	4	D5	320 Ω, 1W	I.R.C.	BT1	
R7	Anode Decoupling	V1A	4	G5	2,000 Ω, 1W	I.R.C.	BT1	600,687
R8	Grid Decoupling	V1B	4	E4	0.1 MΩ, 1/2W	I.R.C.	BT1/2	
R9	Cathode Bias	V1B	4	F5	320 Ω, 1W	I.R.C.	BT1	
R10	R.F. Gain Control	-	3	D2	3,000 Ω, W.W., variable	A.W.A.		13189
R11	"S" Meter Bridge Arm	-	4	M4	80,000 Ω, 2W (2-0.16 MΩ, 1W in parallel)	I.R.C.	BT1	600,725
R12	"S" Meter Adjusting	-	4	B2	3,000 Ω, W.W., variable	A.W.A.		6775G
R13	"S" Meter Bridge Arm	-	4	M4	400 Ω, 1W	I.R.C.		
R14	Anode Decoupling	V1B	4	G5	2,000 Ω, 1W	I.R.C.	BT1	600,687

APPENDIX 1 (Contd.)

Circ. Ref. No.	Description	Assoc. With Valve	Plate	Location	Type, Rating and Remarks	Manufacturer Name	Manufacturer Design.	AWA Type Or Ref. No.
R15	Cathode Bias	V2A	4	H5	320 Ω, 1W	I.R.C.	BT1	
R16	Triode Grid Leak	V2A	4	G5	50,000 Ω, 1W	I.R.C.	BT1	600,715
R17	Screen Feed	V2A	4	G5	63,000 Ω, 1W	I.R.C.	BT1	600,717
R18	Grid Leak	V5A	4	J5	32,000 Ω, 1W	I.R.C.	BT1	600,711
R19	Anode Decoupling	V2A	4	M4	2,000 Ω, 1W	I.R.C.	BT1	600,687
R20	Screen Potentiometer	V1A-D	4	K8	20,000 Ω, 2W (2-40kΩ, 1W in parallel)	I.R.C.	BT1	600,713
R21	Screen Potentiometer	V1A-D	4	K8	17,000 Ω, 3W (3-50kΩ, 1W in parallel)	I.R.C.	BT1	600,715
R22	Grid Decoupling	V1C	3	B3	0.1 MΩ, 1/2W	I.R.C.	BT1/2	
R23	Cathode Bias	V1C	4	M4	630 Ω, 1W	I.R.C.	BT1	600,677
R24	Anode Decoupling	V1C	4	K8	2,000 Ω, 1W	I.R.C.	BT1	600,687
R25	Cathode Bias	V1D	4	J7	630 Ω, 1W	I.R.C.	BT1	600,677
R26	Anode Decoupling	V1D	4	J8	2,000 Ω, 1W	I.R.C.	BT1	600,687
R27	Signal Diode Filter	V3A	4	G7	0.1 MΩ, 1/2W	I.R.C.	BT1/2	
R28	Signal Diode Load	V3A	4	J8	0.25 MΩ, 1W	I.R.C.	BT1	600,729
R29	Cathode Bias	V3A	4	F6	3,200 Ω, 1W	I.R.C.	BT1	600,691
R30	Screen Potentiometer	V3A	4	J8	1 MΩ, 1W	I.R.C.	BT1	600,741
R31	A.F. Gain Control	V3A	3	L2	1 MΩ, variable, potentiometer	A.W.A.		16430A
R32	Screen Potentiometer	V3A	4	J8	0.5 MΩ, 1W	I.R.C.	BT1	600,735
R33	A.V.C. Diode Load Pot.	V3A	4	G8	1 MΩ, 1W	I.R.C.	BT1	600,741
R34	A.V.C. diode Load Pot.	V3A	4	G8	1 MΩ, 1W	I.R.C.	BT1	600,741
R35	A.V.C. Diode Decouple	-	4	G8	1 MΩ, 1W	I.R.C.	BT1	600,741
R36	A.V.C. Diode Decouple	-	4	G8	1 MΩ, 1W	I.R.C.	BT1	600,741
R37	Anode Load	V3A	4	E8	0.2 MΩ, 1W	I.R.C.	BT1	600,727
R38	Anode Decoupling	V3A	4	E8	50,000 Ω, 1W	I.R.C.	BT1	600,715
R39	Inverse Feedback	V4A	4	E8	3.2 MΩ, 1W	I.R.C.	BT1	600,751
R40	Cathode Bias	V4A	4	D7	250 Ω, 3W, W.W.	I.R.C.	AA Ctg.C	602,369

APPENDIX 1 (Contd.)

Circ. Ref. No.	Description	Assoc. With Valve	Plate	Location	Type, Rating and Remarks	Manufacturer		AWA Type Or Ref. No.
						Name	Design.	
R41	Grid Suppressor	V4A	4	D7	50,000 Ω, 1/2W	I.R.C.	BT1/2	
R42	Grid Leak	V4A	4	D7	0.5 MΩ, 1/2W	I.R.C.	BT1/2	
R43	Anode Decoupling	V5B	4	A7	50,000 Ω, 1W	I.R.C.	BT1	600,715
R44	B.F.O. Control	V5B	4	B5	250 Ω, W.W., variable	A.W.A.		12612
R45	Grid Leak	V5B	4	B6	50,000 Ω, 1W	I.R.C.	BT1	600,715
R46	Heater Series	V5B	4	E7	40 Ω, 3W, W.W	I.R.C.	AA Ctg.C	602,353
R47	Pilot Lamp Series	-	4	C5	32 Ω, 3W, W.W	I.R.C.	AA Ctg.C	602,351
R48	Buffer	-	6		100 Ω, 3W, W.W	I.R.C.	AA Ctg.C	602,361
R49	Buffer	-	6		100 Ω, 3W, W.W	I.R.C.	AA Ctg.C	602,361
R51	Meter Series	-	3	L4	50,000 Ω, 1W, ±2½%	I.R.C.	BT1	
R52	Meter Series	-	3	L4	4,000 Ω, 1W, ±2½%	I.R.C.	BT1	
R53	Meter Series	-	3	L4	16,000 Ω, 1W, ±2½%	I.R.C.	BT1	
R54	Meter Series	-	3	L4	4,000 Ω, 1W, ±2½%	I.R.C.	BT1	
R55	Meter Series	-	3	L4	320 Ω, 1W, ±2½%	I.R.C.	BT1	
	<u>Inductors</u>							
L1	Aerial Coupling	-	7		Band A, Aerial Inductor	A.W.A.		13265
L2	Input Tuning	V1A	7		Band A, Aerial Inductor	A.W.A.		13265
L3	Anode Coupling	V1A	7		Band A, 1st R.F. Inductor	A.W.A.		13263
L4	Input Tuning	V1B	7		Band A, 1st R.F. Inductor	A.W.A.		13263
L5	Anode Coupling	V1B	7		Band A, 2nd R.F. Inductor	A.W.A.		13263
L6	Input Tuning	V2A	7		Band A, 2nd R.F. Inductor	A.W.A.		13263
L7	Anode Tuning	V5A	7		Band A, Osc. Inductor	A.W.A.		13261
L8	Grid Coupling	V5A	7		Band A, Osc. Inductor	A.W.A.		13261

APPENDIX 1 (Contd.)

Circ. Ref. No.	Description	Assoc. With Valve	Plate	Location	Type, Rating and Remarks	Manufacturer Name	Manufacturer Design.	AWA Type Or Ref. No.
L9	Aerial Coupling	-	7		} Band B, Aerial Inductor	A.W.A.		13259
L10	Input Tuning	V1A	7		} Band C, Aerial Inductor	A.W.A.		13253
					} Band D, Aerial Inductor	A.W.A.		13247
					} Band E, Aerial Inductor	A.W.A.		13233
					} Band F, Aerial Inductor	A.W.A.		13241
L11	Aerial Coupling	V1A	7		} Band B, 1st R.F. Inductor	A.W.A.		13257
L12	Input Tuning	V1B	7		} Band C, 1st R.F. Inductor	A.W.A.		13251
					} Band D, 1st R.F. Inductor	A.W.A.		13245
					} Band E, 1st R.F. Inductor	A.W.A.		13229
					} Band F, 1st R.F. Inductor	A.W.A.		13237
L13	Aerial Coupling	V1B	7		} Band B, 2nd R.F. Inductor	A.W.A.		13257
L14	Input Tuning	V2A	7		} Band C, 2nd R.F. Inductor	A.W.A.		13251
					} Band D, 2nd R.F. Inductor	A.W.A.		13245
					} Band E, 2nd R.F. Inductor	A.W.A.		13231
					} Band F, 2nd R.F. Inductor	A.W.A.		13237
L15	Anode Tuning	V5A	7		} Band B, Osc. Inductor	A.W.A.		13253
L16	Grid Coupling	V5A	7		} Band C, Osc. Inductor	A.W.A.		13249
					} Band D, Osc. Inductor	A.W.A.		13243
					} Band E, Osc. Inductor	A.W.A.		13227
					} Band F, Osc. Inductor	A.W.A.		13235
L17	I.F. Crystal Filter Input Transformer Prim.	V2A	3 & 4	B3 AND L3	}			
					} I.F. Crystal Filter Input Transformer	A.W.A.		13197
L18	I.F. Crystal Filter Input Transformer Sec.	V2A	3	B3	}			
L19	I.F. Crystal Filter Output	V1C	3	B4	I.F. Crystal Output	A.W.A.		13195

APPENDIX 1 (Contd.)

Circ. Ref. No.	Description	Assoc. With Valve	Plate	Location	Type, Rating and Remarks	Manufacturer		AWA Type Or Ref. No.
						Name	Design.	
L20	1st I.F. Transfmr. Pri.	V1C	3 & 4	B7 and L7	} 1st I.F. Transformer	A.W.A.		13191
L21	1st I.F. Transfmr. Sec.	V1D	3	B7	}			
L22	2nd I.F. Transfmr. Pri.	V1D	3 & 4	F7 and G7	} 2nd I.F. Transformer	A.W.A.		13193
L23	2nd I.F. Transfmr. Sec.	V3A	3	F7	}			
L24	B.F.O. Tuning	V5B	4	B5	} B.F.O. Inductor	A.W.A.		12669
L25	B.F.O. Control Couple	V5B	4	B5	}			
L26	R.F. Choke, H.T. +	-	6		500 µH, 150 mA	A.W.A.		13809
L27	A.F. Choke	-	5		6H, 100mA	A.W.A.		1TX6731
L28	A.F. Choke	-	5		6H, 100mA	A.W.A.		1TX6731
L29	R.F. Choke Heater Supply	-	6		20 µH, 6A	A.W.A.		3149
L30	R.F. Choke H.T. -	-	6		500 µH, 150mA	A.W.A.		13809
L31	R.F. Choke Vibrator Pri.	-	6		20 µH, 6A	A.W.A.		3149
L32	R.F. Choke Vibrator Pri.	-	6		20 µH, 6A	A.W.A.		3149
L33	R.F. Choke Vibrator Coil	-	6		20 µH, 6A	A.W.A.		3149
L34	R.F. Choke L.T. Supply	-	6		20 µH, 6A	A.W.A.		3149
	Transformers							
T1	Output	V4A	3	M5	Primary 5,000 Ω	A.W.A.		2TU14034
					Secondary 3.7 and 600 Ω	A.W.A.		
T2	Power	-	5		Input, 70 watts	A.W.A.		3TK14017
					Output, 260v R.M.S., 100mA DC	A.W.A.		
	Switches							
S1	Meter		3	K1	3 Pole, 5 position, rotary	A.W.A.		16286

APPENDIX 1 (Contd.)

Circ. Ref. No.	Description	Assoc. With Valve	Plate	Location	Type, Rating and Remarks	Manufacturer Name	Manufacturer Design.	AWA Type Or Ref. No.
S2	Facility		4	L1-2	4 Pole, 4 position, rotary	A.W.A.		13743
S3	Mains Selector		4		3 Pole, 2 position, rotary	A.W.A.		16281
S4	ON-OFF		5		2 Pole, 2 position, toggle	Scanlan		12016
S5	Crystal IN-OUT		3	B2	1 Pole, 2 position, rotary	A.W.A.		13704
S6	AC - DC				3 Pole, 2 position, rotary	A.W.A.		16279
	<u>Jacks</u>							
J1	Headphone or Line		3	J3	Single Circuit	R.O. Whitford		S2377
J2	Headphone or Line		3	J3	Single Circuit	Pty. Ltd.		S2377
	<u>Sockets</u>							
S01	4 Point Receiver Power Unit		3	K8		Amphenol	RS4	
S02	4 Point Loudspeaker		6			Amphenol	RS4	
	<u>Plugs</u>							
PL1	4 Point Receiver Power Unit					Amphenol	PM4	
PL2	3 Point, Battery Connection		6			A.W.A.		10581A
PL3	A.C. Mains Input					A.W.A.		13728
	<u>Fuses</u>							
F1	Vib. Pri. Cartridge 10 Amps.		6					370013

APPENDIX 1 (Contd.)

Circ. Ref. No.	Description	Assoc. With Valve	Plate	Location	Type, Rating and Remarks	Manufacturer Name	Manufacturer Design.	AWA Type Or Ref. No.
F2	A.C. Mains Cartridge 3 Amps.		6					370011
F3	H.T. Cartridge, 250 mA		6					270004
	Lamps							
P1	Receiver ON-OFF Indicator		3	J1	Radio Dial Lamp 6-8V 0.25A, Min ES Base			
	Meters							
M1	"S" Meter/Output Meter		3	L1		University	F2-2	
	Crystals							
X1	455 kc.		3	B2		A.W.A.		R5587
	Rectifiers							
W1	Metering		3	L4	1 mA Instrument type	McKenzie & Holland	MBS1	
	Valves							
V1A	6U6G, 1st R.F. Amp.		3	J5				
V1B	6U6G, 1st R.F. Amp.		3	G5		A.W.V.		
V1C	6U6G, 1st R.F. Amp.		3	B5		A.W.V.		
V1D	6U6G, 1st R.F. Amp.		3	D8		A.W.V.		
V2A	6J8G, Frequency Converter		3	F5		A.W.V.		
V3A	6G8G, Det., A.V.C. & A.F. Amp.		3	H7		A.W.V.		
V4A	6V6G, Output		3	J8		A.W.V.		
V5A	6J5GT, Local Oscillator		3	D6		A.W.V.		
V5B	6J5GT, Beat Freq. Oscillator		3	L8		A.W.V.		
V6A	6X5GT, Rectifier		5			A.W.V.		
V6B	6X5GT, Rectifier		5			A.W.V.		

APPENDIX 1 (Contd.)

Circ. Ref. No.	Description	Assoc. With Valve	Plate	Location	Type, Rating and Remarks	Manufacturer		AWA Type Or Ref. No.
						Name	Design.	
V2A	6J8G, Frequency Converter		3	F5		A.W.V.		
V3A	6G8G, Det, A.V.C. and A.F. Amp.		3	H7		A.W.V.		
V4A	6V6G, Output		3	J8		A.W.V.		
V5A	6J5GT, Local Oscillator		3	D6		A.W.V.		
V5B	6J5GT, Beat Frequency Osc.		3	L8		A.W.V.		
V6A	6X5GT, Rectifier		3			A.W.V.		
V6B	6X5GT, Rectifier		3			A.W.V.		

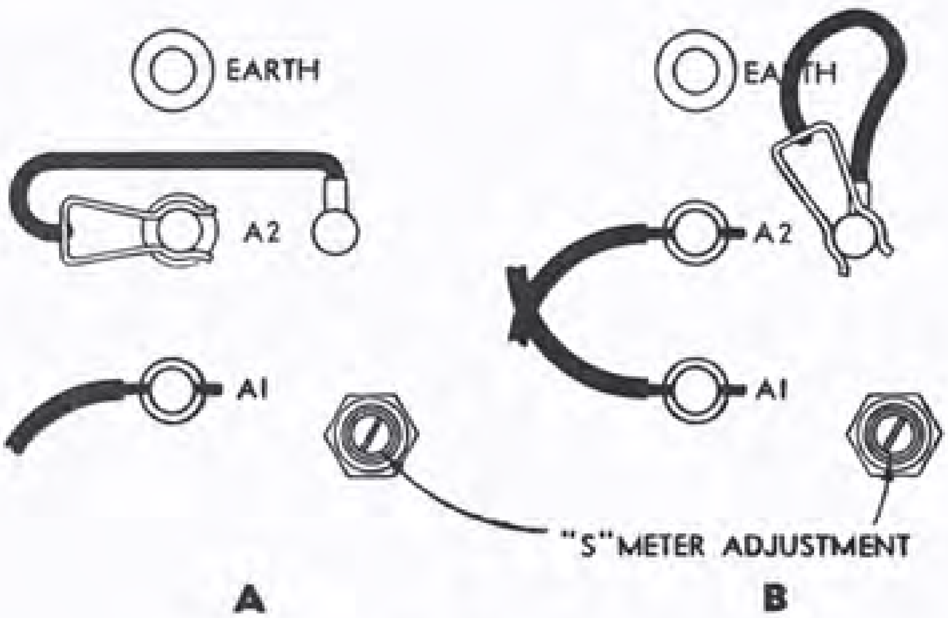


FIG. 1 — AERIAL CONNECTIONS.

A — Connections for single wire aerial.
B — Connections for doublet aerial.

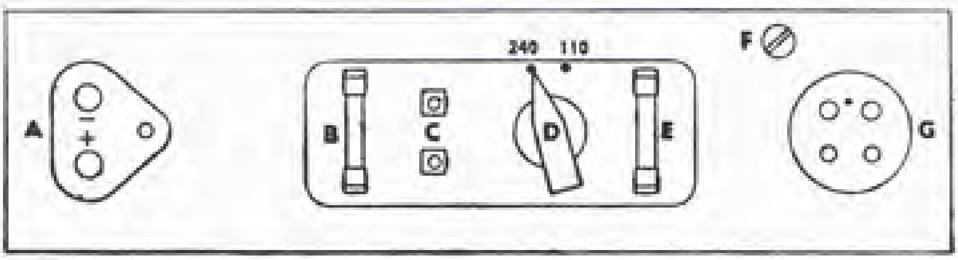


FIG. 2 — UNIVERSAL POWER UNIT CONNECTIONS.

A—Battery input plug; B—A.C. mains fuse—3 amp.; C—A.C. mains input plug; D—Selector switch; E—Battery fuse—10 amp.; F—Screw for connecting metal braiding on Receiver cable to Power Unit chassis; G—Socket for Receiver cable.

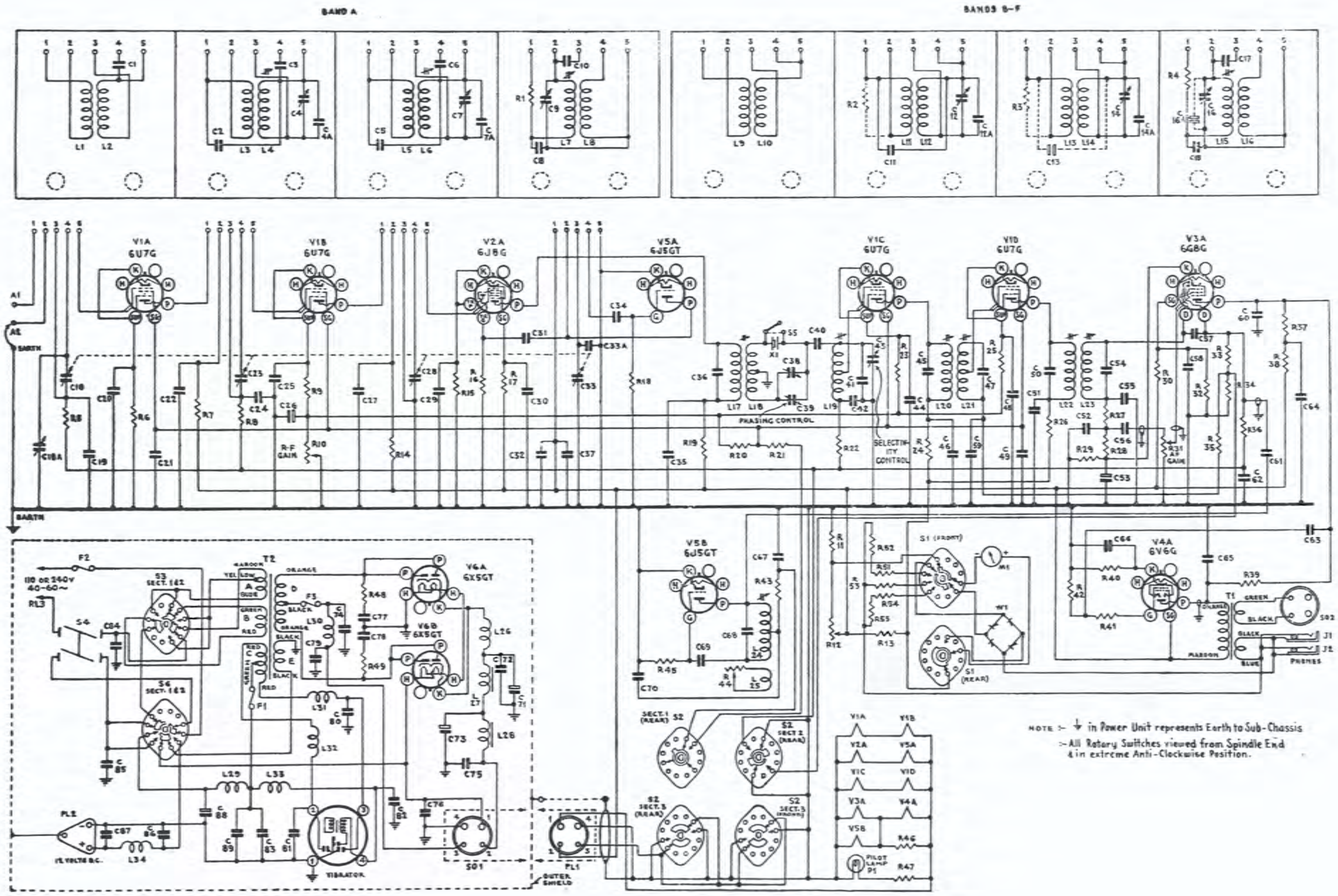


FIG. 3 — CIRCUIT DIAGRAM.

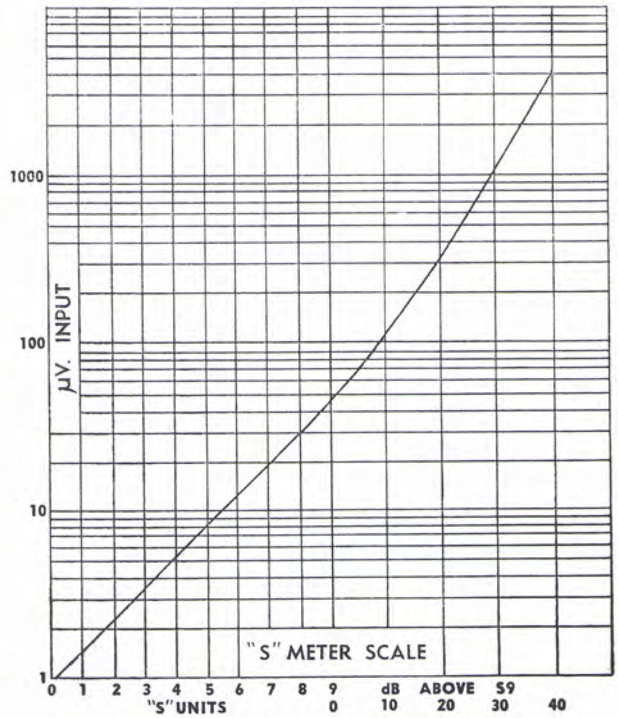
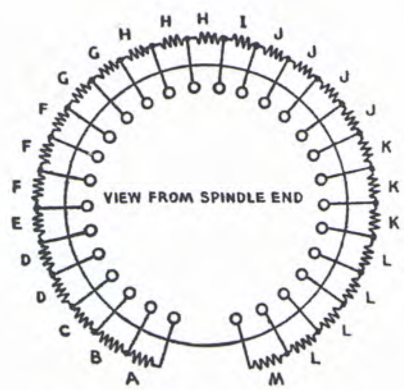


FIG. 4—"S" METER CURVE.



CODE	VALUE	CODE	VALUE
A	320 Ω	H	10,000 Ω
B	500 Ω	I	20,000 Ω
C	800 Ω	J	32,000 Ω
D	1000 Ω	K	63,000 Ω
E	2000 Ω	L	0·1 MEG. Ω
F	3200 Ω	M	0·2 MEG. Ω
G	5000 Ω		

FIG. 5—VOLUME CONTROL SCHEMATIC.

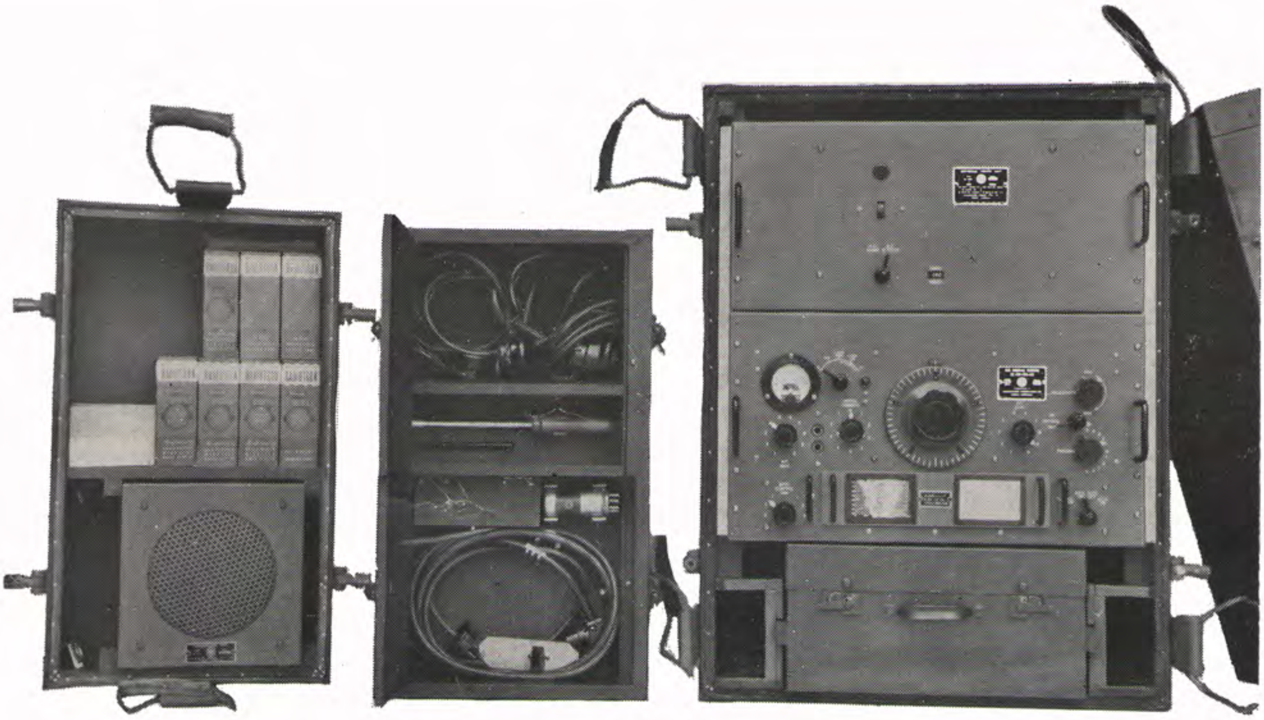


PLATE 1—EQUIPMENT PACKED IN CARRYING CASES.

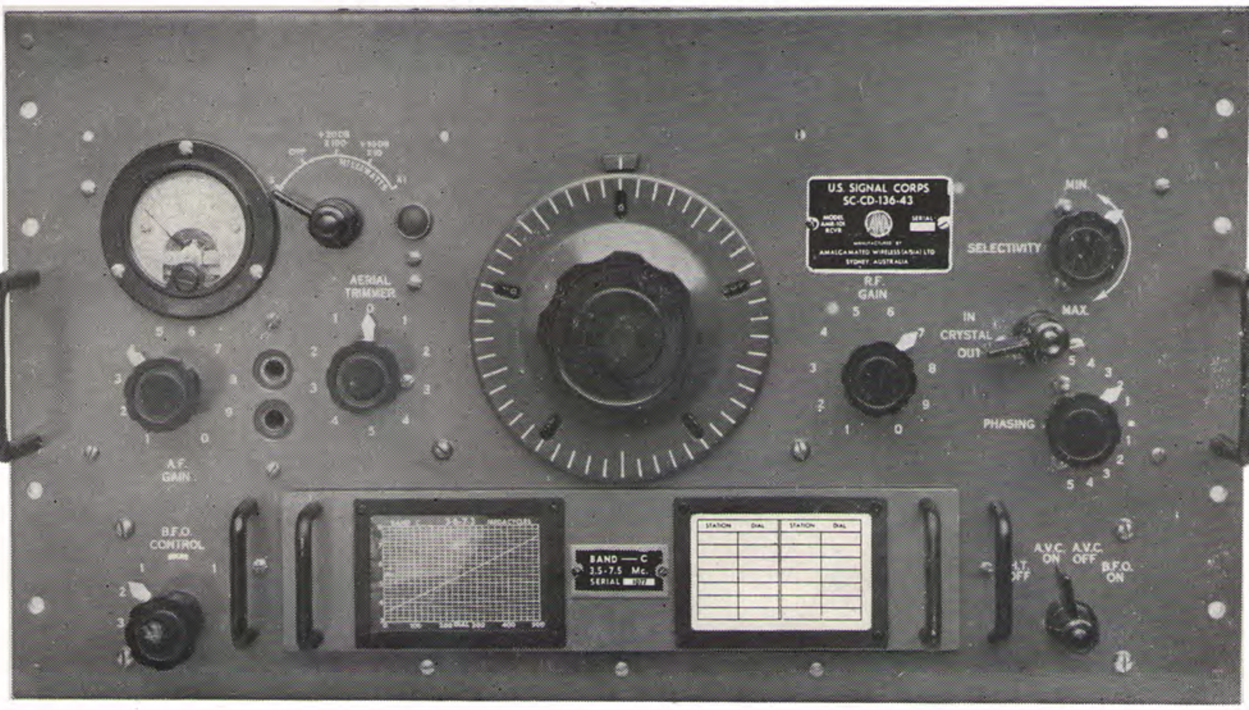


PLATE 2—RECEIVER FRONT PANEL.

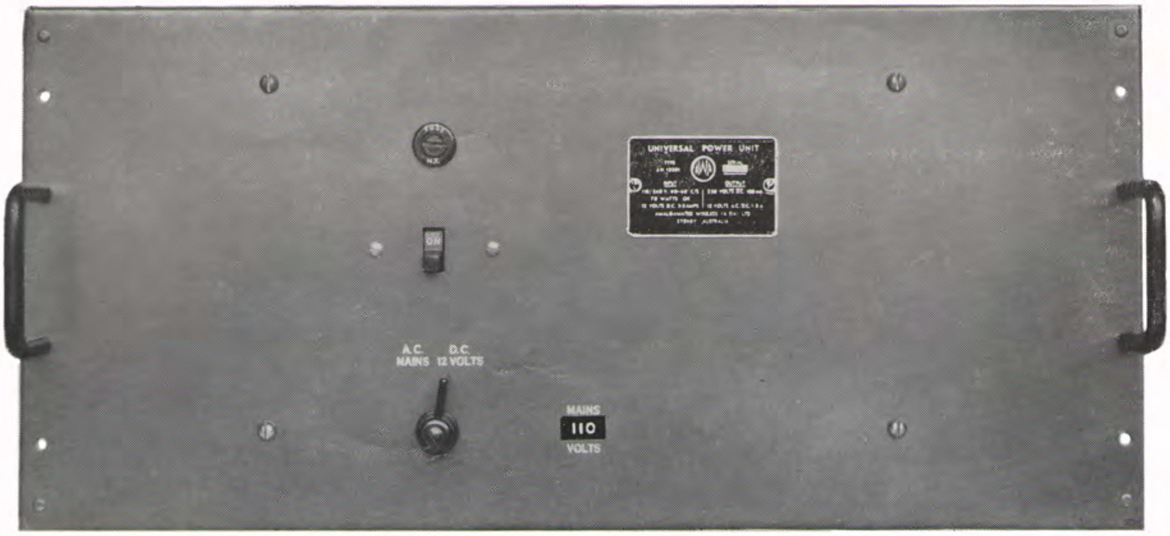


PLATE 3—POWER UNIT FRONT PANEL.

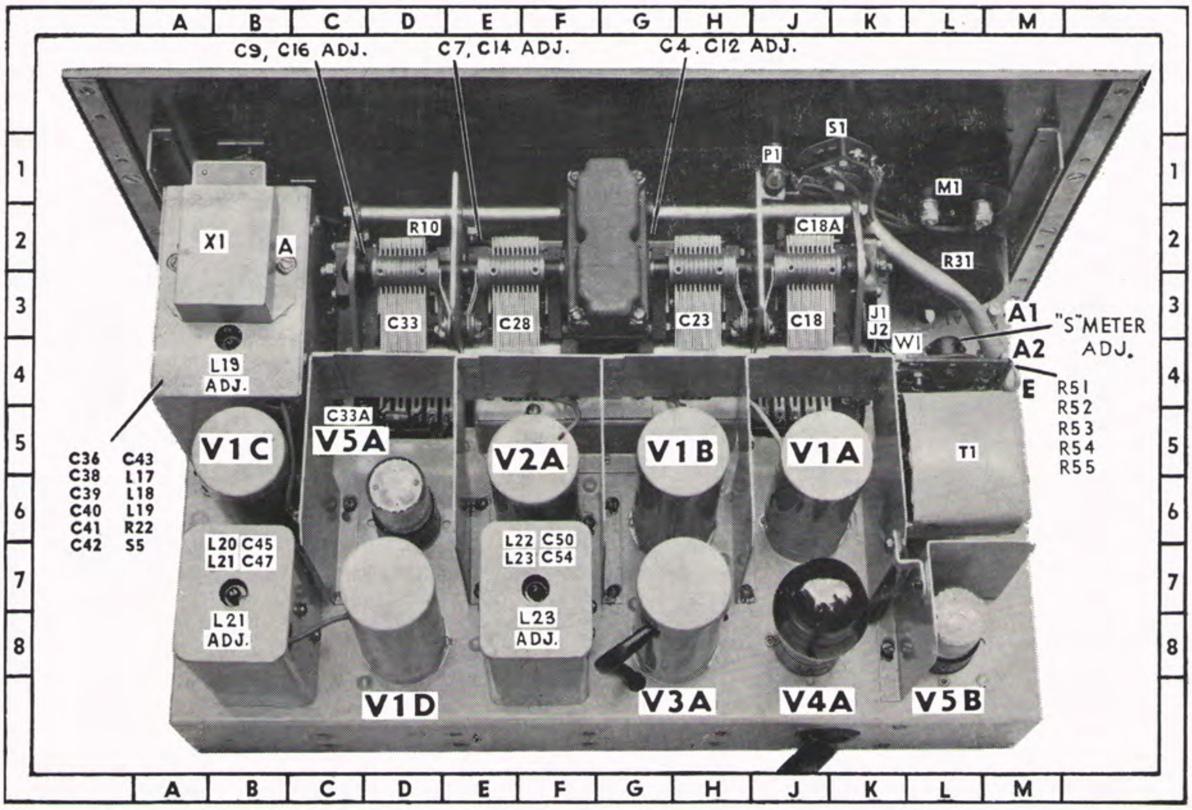


PLATE 4—RECEIVER CHASSIS—TOP VIEW.

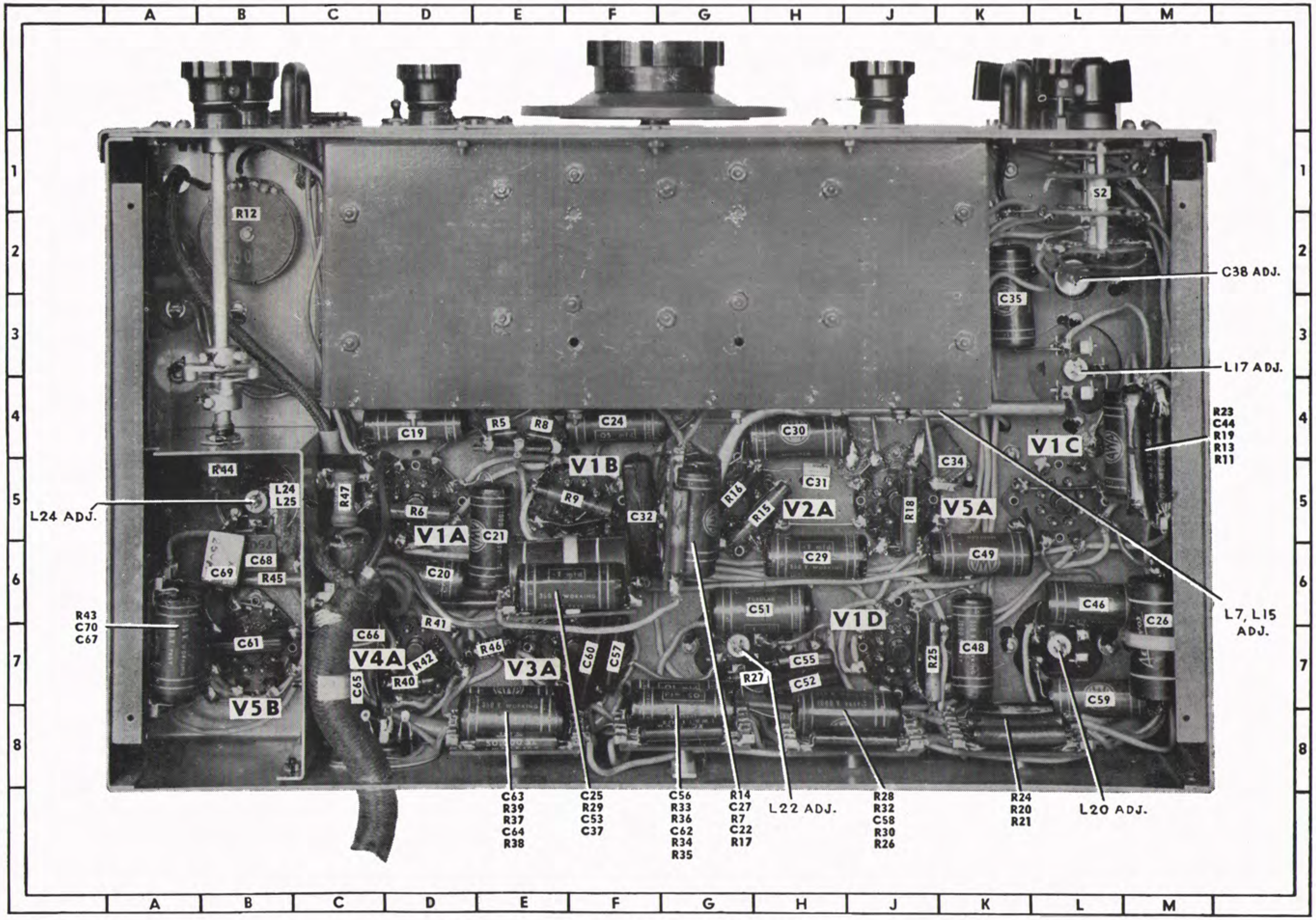


PLATE 5—RECEIVER CHASSIS—UNDERNEATH VIEW.

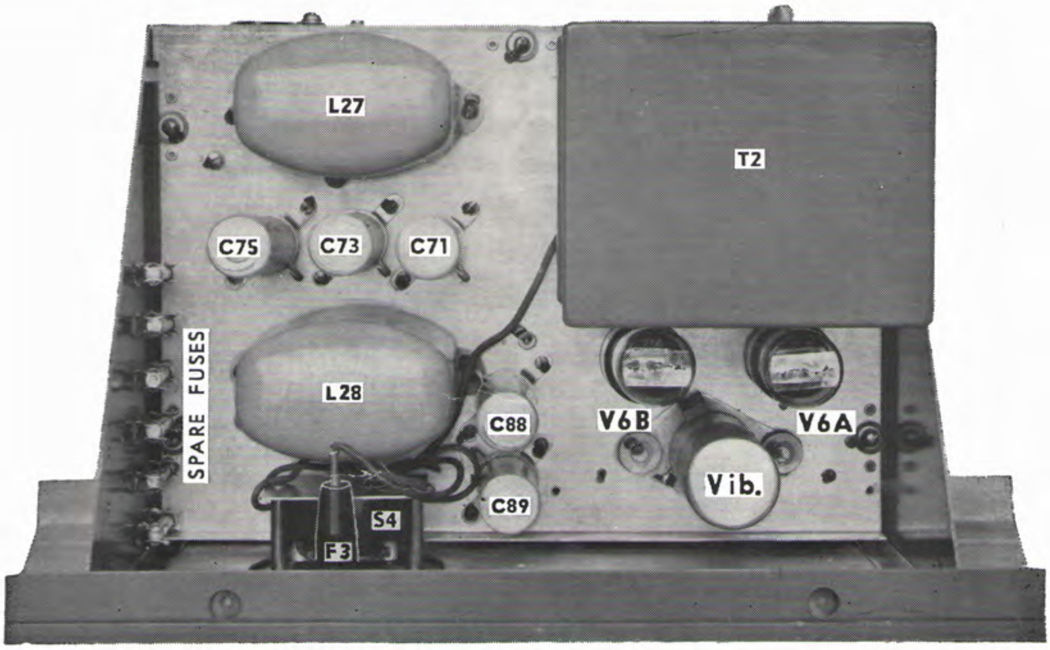


PLATE 6—POWER UNIT CHASSIS—TOP VIEW.

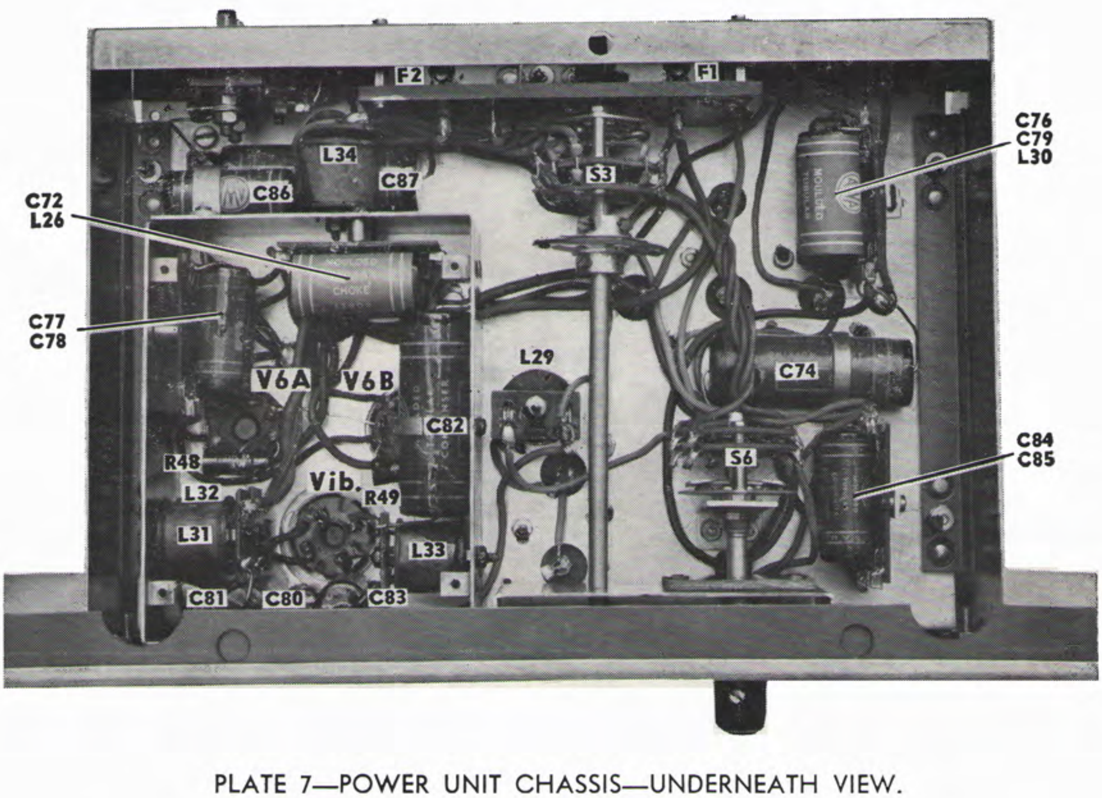
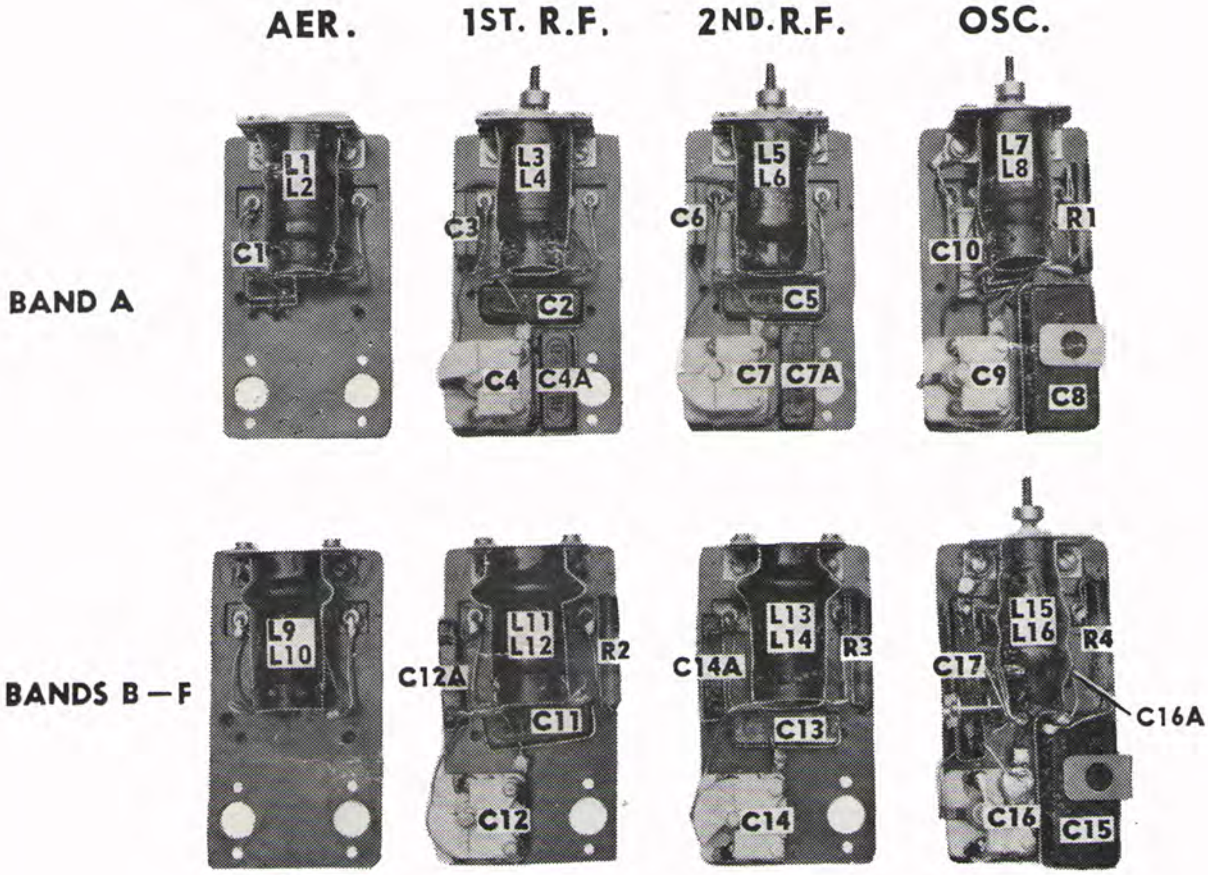


PLATE 7—POWER UNIT CHASSIS—UNDERNEATH VIEW.



C13—Used on Bands B, C and D only.
C16A—Used on Band F only.
R2, R3—Used on Bands C and D only.

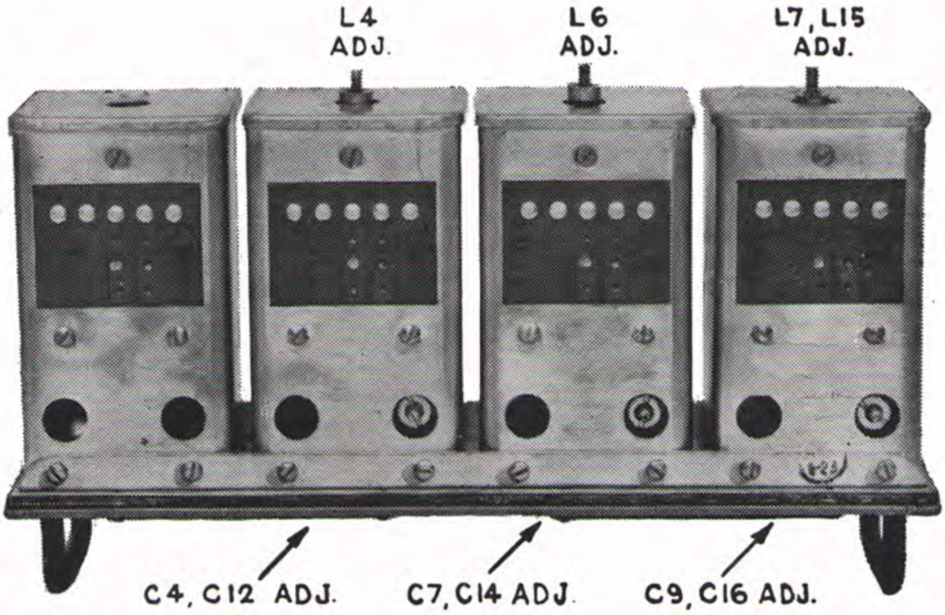


PLATE 8—COIL UNITS, SHOWING ADJUSTMENTS.