Instruction Manual

for

MARCONI
"ATALANTA"

GENERAL PURPOSE MARINE RECEIVER
(TYPE 2207C)

Handbook Ref. R.37/58

Published by
Technical Information Branch, Technical Division
THE MARCONI INTERNATIONAL MARINE
COMMUNICATION COMPANY LTD.
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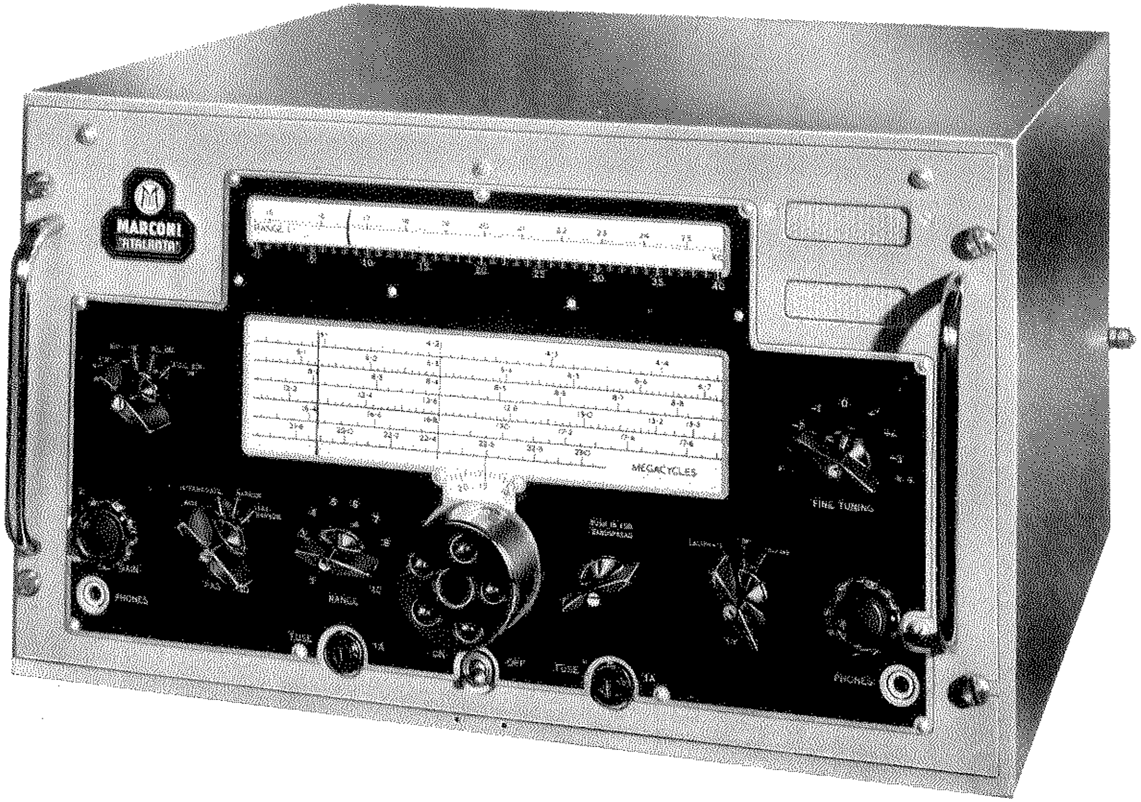

"Atalanta" general purpose marine receiver (type 2207C)

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"ATALANTA" RECEIVER TYPE 2207C

DESCRIPTION, INSTALLATION, OPERATING

AND

MAINTENANCE INSTRUCTIONS

FOR

MARCONI MARINE "ATALANTA" GENERAL PURPOSE MARINE RECEIVER

(TYPE 2207C)

SECTION I

INTRODUCTION

The "Atalanta" receiver has been tested and type approved to the latest international regulations and conforms to the British General Post Office specification for a general purpose receiver for ships.

Complete coverage is provided by the receiver over the frequency band 15 kc/s. to 28 Mc/s. in ten ranges, with band spread scales directly calibrated in frequency for the six H.F. marine bands. Additionally, electrical fine tuning of $\pm$ 3 kc/s. provides signal tuning discrimination of great accuracy. The wide frequency range available and the complete coverage of the receiver makes it suitable for mobile, maritime or fixed stations having to receive signals from a wide range of transmitting sources.

The receiver, which is normally mounted in a bench-type cabinet may, to meet special requirements, be fitted on a standard 19-inch rack. The "Atalanta" operates directly from 110 or 220 volts D.C., or 115 or 230 volts A.C. in conjunction with the necessary power units.

SECTION II

BRIEF SPECIFICATION

2.1. TYPES OF SERVICE

Telephony or telegraphy ... ... A1, A2, A3.

2.2. FREQUENCY RANGE

The receiver covers the band 15 kc/s. to 20 Mc/s. in ten ranges as follows:—

Range 1.	15–25 kc/s. (20,000–12,000 m.)
2.	25–100 kc/s. (12,000–3,000 m.)
3.	100–200 kc/s. (3,000–1,500 m.)
4.	200–400 kc/s. (1,500–750 m.)
5.	400–800 kc/s. (750–375 m.)
6.	800 kc/s.–1·7 Mc/s. (375–176·4 m.)
7.	1·7–3·6 Mc/s. (176·4–83·4 m.)
8.	3·6–7·5 Mc/s. (83·4–40 m.)
9.	7·5–15 Mc/s. (40–20 m.)
10.	15·0–28·0 Mc/s. (20–10·7 m.)

2.3. PERFORMANCE DATA

2.3.1. Receiver Outputs

(*a*) 10 mW. into low impedance 'phones (two jacks).
(*b*) 1 watt into an optional external loudspeaker of between 3 and 5 ohms impedance.
(*c*) Output suitable for transmitter handset (300 ohms impedance).

2.3.2. Receiver Inputs

The receiver is designed to give the best performance with the following inputs:—
(*a*) For frequencies below 4 Mc/s. the total aerial and co-axial capacity should not exceed 800 pF.
(*b*) Above 4 Mc/s. the receiver input impedance is 75 ohms unbalanced.

2.3.3. Intermediate Frequency

On ranges 1, 3, 4 and 5 an I.F. of 85 kc/s.
On range 2 and ranges 6 to 10 a 1st I.F. of 700 kc/s. and a 2nd I.F. of 85 kc/s.

2.3.4. Selectivity

Four degrees of selectivity are provided.
The following are the bandwidths at 6 dB. attenuation:—

8 kc/s. on 'Wide' (above 1·5 Mc/s.)
3 kc/s. on 'Intermediate' (above 160 kc/s.)
1000 c/s. on 'Narrow' (above 100 kc/s.)
100 c/s. on 'Very Narrow'

2.3.5. Sensitivity

The input required for a 20 dB. signal to noise ratio, C.W. conditions, is as follows:—

Frequency	*Bandwidth*	*Dummy Aerial*	*Input*
15–160 kc/s.	1000 c/s.	300 pF.	8–20μV.
160–1500 kc/s.	3 kc/s.	300 pF.	4–10μV.
1500–4000 kc/s.	8 kc/s.	300 pF.	2·5–3·5μV.
4–15 Mc/s.	8 kc/s.	75 ohms	1·5–2·5μV.
15–28 Mc/s.	8 kc/s.	75 ohms	2–3μV.

2.3.6. Image Protection

Better than 85 dB. from 15 kc/s. to 3 Mc/s.
Better than 65 dB. from 3 Mc/s to 7·5 Mc/s.
Better than 45 dB. from 7·5 Mc/s. to 15 Mc/s.
Better than 30 dB. from 15 Mc/s. to 28 Mc/s.

2.3.7. A.G.C.

Not more than 8 dB. change in output for a 60 dB. change in input.

2.4. SALIENT FEATURES

2.4.1. Desensitising

Receiver desensitising is by means of:—

(*a*) A high speed relay where 24 volts D.C. is available.
(*b*) Back contact key desensitising when 24 volts is not available.

2.4.2. Protection

When 24 volts D.C. is available protection is afforded against possible damage to the receiver circuits from an associated transmitter, by the inclusion of a high speed relay.

2.4.3. Stability

A high degree of electrical and thermal stability is ensured in the receiver by the provision of a voltage stabiliser and a temperature compensator.

2.4.4. Sidetone

Sidetone from an associated transmitter may be fed through the A.F. circuits of the receiver to the 'phones or loudspeaker.

2.4.5. Logging Scale

Fine and coarse logging scales are provided for noting accurately the setting of a particular station.

2.4.6. Bandspread

Bandspread scales covering the six H.F. marine bands are normally provided and a built-in 700 kc/s. crystal oscillator is used for setting-up these scales.

2.4.7. Frequency Checking

A built-in 700 kc/s. crystal oscillator is provided for setting-up the band-spread scale and for frequency checking purposes.

2.4.8. Duplex Rejector

A type 2361 rejector unit, or equivalent, may be used with the receiver for rejecting the associated transmitter frequency on duplex operation.

2.4.9. Muting

A muting circuit can be added to an existing receiver.

The purpose of this circuit is to reduce the receiver gain in the absence of an incoming transmitter carrier.

When fitted with a muting circuit the receiver becomes type 2207D.

2.5. POWER SUPPLIES

The receiver operates directly from 110 volts, D.C. mains or via separate power units depending on the supply, as follows:—

Type 2202A	115 volts, 220–250 volts 50/60 c/s. A.C. mains.
Type 2203A	24 volts D.C.
Resistor unit	220 volts, D.C.

2.5.1. Power Consumption

24 volts D.C.	90 watts
110 volts D.C.	45 watts
220 volts D.C.	90 watts
115 volts A.C.	65 watts

2.6. DIMENSIONS AND WEIGHT

Height	$12\frac{9}{16}$" (31·9 cm.)
Width	$19\frac{1}{2}$" (49·5 cm.)
Depth	$19\frac{13}{16}$" (50·3 cm.)
Weight	78 lb. (35·4 kg.)

SECTION III

DESCRIPTION OF EQUIPMENT

3.1. GENERAL DESCRIPTION

A receiver installation will consist of a combination of the following units, depending on requirements:—

(*a*) "Atalanta" general purpose marine receiver, type 2207C, drawing W.43720, Ed. E.

(*b*) A.C. power unit type 2202A, drawing W.49355, Ed. A.

(*c*) 24 volts D.C. power unit type 2203A, drawing W.49348, Ed. A.

(*d*) Resistor unit, "Berco" VGHK5/SA69, for operating from 220 volts D.C. mains.

(*e*) Rejector unit type 2361, drawing W.49837, Ed. A–D.

Type 2361A H.F. and I.F. filters with automatic control.
Type 2361B H.F. and I.F. filters with manual control.
Type 2361C I.F. filter only with automatic control.
Type 2361D I.F. filter only with manual control.

The receiver is constructed on a steel chassis, which is insulated from earth by insulating side panels and pillars between the two front panels, and is suitable for mounting in a bench-type cabinet or on a standard 19-inch rack.

An outline diagram of the receiver is shown on drawing WZ.13163/D sheet 1 which shows the positions of all the operational controls on the front panel and the main dimensions of the receiver. The functions of the controls are described in section 3.2.

The chassis may be easily withdrawn from the cabinet by removing the four knurled headed screws on the front panel and withdrawing by means of the handles. For complete removal from the cabinet, disconnect the plug and socket connections on the rear of the chassis top. The component location of the top of the chassis and the location of coil unit components is shown on drawing WZ.14127/D sheet 1. All valves, I.F. coil units, main tuning capacitors, etc., are located on the top of the chassis. The inductances, trimmers, etc., of the aerial, 1st R.F., 2nd R.F. and oscillator stages are constructed on separate sub-assemblies and are mounted in the right-hand half of the chassis. The trimmer capacitors of these circuits are adjustable from the top of the chassis and are protected with an insulated board.

The component location of the underside of the chassis is shown on drawing WZ.14127/D sheet 2. As will be seen from this drawing, most of the smaller components are mounted on the underside and have been so located to make them easily accessible for servicing.

The drive components associated with the main tuning and bandspread controls together with the mechanisms operating the scale pointer and calibration drum are mounted on an inner front panel. Removal of the front panel gives access to the pulleys for cord replacements and adjustment.

The ten ranges are calibrated on a drum which rotates on a horizontal axis; this drum is rotated by the range switch. Between the front and inner front panels above the calibration drum, are a white reflector plate and the two scale illuminating lamps.

The bandspread scale is a flat scale mounted below the main frequency drum.

The filter unit is located in the top left-hand rear corner of the cabinet and its component location is shown on drawing WZ.14127/D sheet 3.

3.2. CONTROLS

All the main operational controls are located at the front of the receiver and their functions are described in this section. The circuit diagram reference is given after the control.

3.2.1. System Switch (SWH)

This switch has three positions:—

"PHONE" ... ... for the reception of modulated signals.
"C.W." ... ... brings into operation a beat frequency oscillator for telegraphy.
"CALIBRATE" ... switches in a crystal oscillator for frequency checking.

3.2.2. Range Switch (SWA, B, C, D and E)

The contacts of this switch assembly select the appropriate R.F. and I.F. circuits throughout the receiver for the required range, a pulley on the switch spindle rotates the range drum to the correct position for tuning.

3.2.3. Passband Switch (SWF and SWG)

This switch selects the required I.F. passband, it has four positions: "WIDE", "INTERMEDIATE", "NARROW" and "VERY NARROW".

3.2.4. Tuning Control (C16, C37, C56, C99)

This control incorporates an 80 to 1 gear reduction drive for tuning, quick traversal from one part of the scale to another being facilitated by the flywheel action of the knob.

The electrical function of this control is for the variable ganged capacitors to tune the R.F. and oscillator circuits to the required frequency.

For its mechanical function, the spindle is coupled via gearing and a cord to the calibration drum so that rotation of the control causes the tuning pointer to move across the calibrated scale. A coarse logging scale is engraved 1 to 40 on the lower side of the main calibration escutcheon plate. The main pointer moves from one of these numbers to the next for each rotation of the tuning handle. A fine logging scale disc is also fitted to the main spindle and is visible above the tuning knob: this scale shows the position of the knob during one revolution.

Thus the exact position of the tuning control for a received transmission may be accurately recorded.

3.2.5. AGC/NL Switch (SWJ)

The automatic gain control and noise limiter circuits are switched by this control which has four positions; either one or both may be switched in or out of circuit.

3.2.6. A.F. and R.F. Gain Controls (RV1 and RV2, RV3)

The A.F. gain controls the input to the 1st A.F. stages and the R.F. gain controls the gain of the 1st and 2nd R.F. amplifiers and also the 1st I.F. amplifier.

3.2.7. Fine Tuning (C103)

This capacitor varies the frequency of the 615 kc/s. oscillator by ± 3 kc/s., so that this variation is provided on all frequencies above 800 kc/s. and also on the 25–100 kc/s. range.

3.2.8. Bandspread Control

This is a mechanical control, which is either turned manually by the bandspread handle or, when pushed in, engages with the gearing of the main tuning control and is operated by it, to move the pointer across the bandspread scale.

The bandspread scales expand six bands in the H.F. range directly in frequency, thus enabling the accurate pre-tuning of a hitherto unlogged station, knowing only the frequency of the latter. The six bandspread scales are indicated by black rectangular spots on the main scale drum which are located in the range as required.

3.2.9. On/Off Switch (SWK)

This switch controls the power supply to the receiver, or power unit when one is used.

Also located at the front of the receiver are the mains supply fuses FS1 and FS2 and two phones jacks JKA and JKB, one at each side of the panel. A loudspeaker grille is fitted at the top right-hand corner although a loudspeaker is only fitted for special requirements.

3.3. CONNECTIONS

The external connections to the receiver are fed through a slot in the back panel of the cabinet to two terminal blocks on the inside of the panel. A front elevation of the cabinet layout is shown on drawing WZ.14127/D sheet 3. On the right-hand side panel, at the rear, are mounted the aerial socket SKD and an earth bolt.

The connections between the terminal blocks and the receiver chassis are by means of cable-forms which terminate in sockets for connecting to the plugs on the rear of the chassis. This arrangement enables the receiver chassis to be withdrawn for inspection without disconnecting any leads.

The filter unit and A.C. power unit, if mounted in the rear of the cabinet, are connected directly to the terminal blocks.

3.4. VALVES

The types and numbers of valves used in the receiver are as follows:—

TABLE 1

Valve Type	*No. used*
EF85 or W719	3
ECH81 or X719	3 (+1 if muting unit is employed).
W77	1
Z77	2
D77 or EB91	1
6060 or B309	1
N37	1
QS75/20	1

3.5. METERING

Facilities are provided for metering the receiver circuits with a metering unit type 1362A by the provision of three sockets SKE, SKF and SKG on the left-hand side of the chassis, see drawing WZ.14127/D sheet 1. [illegible] Table [illegible]

3.6. POWER SUPPLY UNITS

Three types of power unit are available for use with the receiver when not operating directly from 110 volts D.C. supply.

The A.C. power unit type 2202A is designed for mounting in the receiver cabinet at the top right-hand rear corner or in the auxiliaries rack, type 2224 series.

The component location of this unit is shown on drawing WZ.14361/B sheet 1.

The type 2203A 24 volts D.C. power unit is contained as a separate external unit and employs a rotary transformer. It may be mounted either in the auxiliaries rack type 2224 series, or in an external position. There are no controls on this unit, it being controlled from the panel and/or receiver. A component location of the type 2203A unit is shown on drawing WZ.14364/B sheet 1.

Where 220 volts D.C. mains is available a resistor unit may be used as an intermediary to provide the 110 volts D.C. to the receiver. ("Berco", VGHK5/SA69.)

All connections are made to the power units via terminal blocks.

3.7. REJECTOR UNIT TYPE 2361 SERIES

This unit is designed to operate in conjunction with a receiver to facilitate duplex telephony operation by rejecting the transmitter carrier.

The unit which is 14½ inches long by 10½ inches wide by 3½ inches high is intended to be fitted on the side of a receiver to ensure that the aerial co-axial link between the rejector circuit output and the receiver input is as short as possible. It may be fitted elsewhere if necessary but the aerial link should be kept short.

There are four editions of the unit:—

- Type 2361A, H.F. and I.F. filters with automatic filter selection.
- Type 2361B, as type 2361A but manually controlled.
- Type 2361C, I.F. filter with automatic selection of 6 spot frequencies.
- Type 2361D, as type 2361C but manually controlled.

Frequencies:—

- I.F., 1·6–3·8 Mc/s. Six spot frequencies anywhere in the band.
- H.F., 4, 8, 12, 16 and 22 Mc/s. The Atlantic City Annexe 7 ship transmitting band is rejected.

Full information relating to the type 2361 unit is given in the rejector handbook ref. G.4.

3.8. SWITCHING UNIT TYPE 2432A

Reference should be made to drawings WZ.16914/B sheet 1 and WZ.17704/B Sheet 1.

This unit is used for switching on mains/battery supplies to the receiver by rotating the front panel switch to the appropriate position.

Block schematic diagram WZ.17704/B sheet 1 shows wiring connections which enable the unit to be utilised in four different ways as follows:—

(*a*) Fig. 1 shows the connections necessary when the unit is required to supply the receiver from 110 volts D.C. mains or from a 24/110 volts D.C. convertor.

(*b*) Fig 2 shows the connections necessary when the switching unit is used with the resistor unit to supply the receiver from 220 volts D.C. mains or from a 24/110 volts D.C. convertor.

(*c*) Fig. 3 shows the connections when the switching unit is used with 220 volts mains or 24/220 volts D.C. convertor.

(*d*) Fig. 4 shows the connections necessary when the switching unit is used with 230 or 115 volts A.C. and a convertor supplying similar voltage.

3.9. AUXILIARIES RACK

This rack houses various equipments associated with the receiver including the two power supply units for 24 volts D.C. and 115 volts A.C. supplies.

SECTION IV

TECHNICAL DESCRIPTION

4.1. RECEIVER

The receiver is of the superheterodyne type, a large part of the circuit being of conventional design but some special features are included requiring particular mention and these are more fully described.

Circuit details of the receiver are shown on drawings W.50259 sheets 1 and 2, WZ.14297/D sheets 1 and 2, and the block schematic and simplified drawings on WZ.18293/D sheet 1 and WZ.18294/D sheets 1 and 2 respectively.

The types of valves used in the receiver and their circuit references and functions are given in table 2.

TABLE 2

Circuit Ref.	*Valve Type*	*Function*
V1	EF85 or W719	1st R.F. Amplifier
V2	EF85 or W719	2nd R.F. Amplifier
V3	ECH81 or X719	1st Frequency Changer
V4	EF85 or W719	1st Frequency Changer Oscillator
V5	ECH81 or X719	2nd Frequency Changer and Oscillator
V6	W77	1st I.F. Amplifier
V7	Z77	2nd I.F. Amplifier
V8	D77 or EB91	Final Detector
V9	ECH81 or X719	Beat Frequency Oscillator
V10	B309 or 6060	A.F. Amplifiers
V11	N37	Output Amplifier
V12	QS75/20	Voltage Stabiliser
V13	Z77	Calibrating Oscillator
V14	ECH81 or X719	Muting stage (Optional)

The requirement of covering a very wide frequency range without gaps or 'blind spots' has imposed the necessity of using two intermediate frequencies. One of 85 kc/s. is employed on all ranges while on range 2 and ranges 6 to 10 a 700 kc/s. 1st I.F. is used in addition to the 85 kc/s. 2nd I.F.

4.1.1. R.F. Stages

The input from the aerial is fed via relay contact RLA1 and the range switch wafer SWE to the aerial tuned circuits. Relay RLA operates when 24 volts is applied by the transmitter for desensitising purposes, its contact RLA1 disconnects the aerial input circuits from the aerial and earths the aerial via resistor R5. The receiver desensitising circuit is fully described in section 4.1.10.

The aerial circuits on all ranges, except range 2 (25–100 kc/s.) are tuned transformers, their secondaries being tuned by the tuning capacitor C16. On range 2 an untuned transformer input circuit L3, with an electrostatic screen, is used. High pass and low pass filtering by R97, C180, R121 and tuning capacitor C16 is incorporated in the secondary such that a broad band R.F. circuit, covering 25–100 kc/s., and giving a 4 to 1 range factor is obtained. Resistors R116, R117, R118, R119, R127 and R128 connected between the primaries and aerial on ranges 1, 3, 4, 5, 7 and 8 respectively, damp out any unwanted primary resonance and so reduce inter and cross-modulation.

The outputs of these circuits on all ranges except 3, 4 and 5, are fed via range switch wafer SWE1 to the grid of the 1st R.F. amplifier stage V1, an EF85 variable-mu valve. On ranges 3, 4 and 5 the output of the aerial circuit is link coupled to the primaries of the 1st R.F. circuits and valve V1 is not used. For these ranges valve V1 is cut-off by raising its cathode to approximately H.T. potential, the bottom end of resistors R133 and R2 being isolated from earth by switch wafer SWA5.

Partial and delayed A.G.C. is applied to the 1st R.F. valve V1 from the potential divider R132, R78 in the A.G.C. line.

The 1st R.F. assembly circuits are all tuned transformer circuits except on range 2 where a broadband amplifying circuit is used. On this range high pass filtering is by C181, R98 and low pass filtering by C183, R99 and C182 to obtain the required characteristic. The appropriate circuit is selected by range switch wafer SWD3 except on ranges 3, 4 and 5 where the aerial and 1st R.F. circuits are directly coupled.

An I.F. rejector tuned circuit L1, C1 is connected in series with the primary of L16 on range 6, the whole circuit being shunted by R126. This circuit is designed to reject the 700 kc/s. I.F. since the lower end of range 6 tunes down to 800 kc/s. thus approaching this I.F.

Delayed A.G.C. is applied to valve V2 and R.F. gain is controlled in the cathode line.

The appropriate 1st R.F. circuit is tuned by C37, selected by range switch wafer SWD1 and fed to the grid of the 2nd R.F. stage V2, an EF85 valve.

The 2nd R.F. circuits are of the same type as used for the 1st R.F. stages, the range 2 circuits again being of the broadband type with high and low pass filtering.

On ranges 4 and 5 an image rejector circuit is connected in series with the primaries of L23 and L24 to obtain the required protection. On range 5 the rejector circuit comprises C50, L55 which is tuned to approximately 950 kc/s., while on range 4 capacitor C45 is switched in parallel with C50 by wafer SWC4 to alter the tuning of the rejector circuit to approximately 550 kc/s. The rejector and primaries of L23 and L24 are shunted by resistor R53. The appropriate 2nd R.F. circuit is tuned by C56 and switched by the range switch wafer SWC1, the signal is then fed to the first grid of the 1st frequency changer valve V3.

4.1.2. Frequency Changer Circuits

On ranges 1, 3, 4 and 5, i.e. all ranges up to 800 kc/s. except 25–100 kc/s., the intermediate frequency is 85 kc/s. and only one frequency changer valve, V3, is used together with V4 the 1st frequency changer oscillator. On all other ranges the double superheterodyne principle is used, the I.F.'s being 700 kc/s. and 85 kc/s., on these ranges a 2nd frequency changer and oscillator valve V5 is also used.

The 1st frequency changer circuit consists of an ECH81 (or X719) triode heptode valve V3 of which only the heptode portion is used for mixing, a separate pentode V4 which is triode connected, being used for the oscillator section. The 1st oscillator is of the tuned grid type and on ranges 1 to 9 the inductors L30 to L38 are tuned by capacitor C99 to the fundamental frequency required for mixing, i.e. signal frequency plus intermediate frequency. On range 10, 15–28 Mc/s., the oscillator circuit L39, C99 is tuned to half (signal +IF) frequency for harmonic mixing in V3, i.e. $(15{\cdot}7 - 28{\cdot}7$ Mc/s.$) \div 2 = 7{\cdot}85 - 14{\cdot}35$ Mc/s., the mode of mixing in V3 with the signal frequency giving an I.F. of 700 kc/s. The advantages of this type of mixing are (*a*) reduction in radiation effects, (*b*) decrease in the possibility of the oscillator circuit being 'pulled' off tune while tuning the R.F. circuits, which is the case when a fundamental oscillator frequency and signal frequency are close together in the H.F. range, and (*c*) reduction in frequency drift due to inductive changes.

The oscillator frequencies for each range are calculated as follows:—

Ranges 1, 3, 4 and 5 ... ... f.osc. = fs + 85 kc/s.

Ranges 2, 6 to 9 ... ... f.osc. = fs + 700 kc/s.

Range 10 ... ... $\text{f.osc.} = \dfrac{\text{fs} + 700 \text{ kc/s.}}{2}$

where f.osc. = oscillator frequency

fs = signal frequency.

The primaries and secondaries of the oscillator circuits are selected by the range switch wafers SWB3 and SWB1 respectively. The oscillator tuning capacitor C99, which is ganged with C16, C37 and C56, has connected in parallel with it a temperature compensating capacitor C101 which reduces any frequency drift due to temperature changes in the oscillator tuned circuits.

The 2nd frequency changer V5 is also a triode heptode valve which is switched into circuit on ranges where the 700 kc/s. I.F. is employed. The triode portion of the valve is used in a 615 kc/s. oscillator circuit which beats in the heptode section with the output of the 700 kc/s. I.F. to give a final I.F. of 85 kc/s. Capacitor C103 in the oscillator circuit enables the tuning setting on these ranges to be varied by ±3 kc/s. for fine tuning. On the ranges where this stage is not used the H.T. is removed from V5 by switch SWA2.

4.1.3. I.F. Circuits

Two intermediate frequencies are used in the receiver, one of 85 kc/s. is employed on all ranges while on range 2 and ranges 6 to 10 a 700 kc/s. 1st I.F. is used in addition to the 85 kc/s. 2nd I.F.

The 700 kc/s. I.F. is included where required by the range switch. On ranges 1, 3, 4 and 5 the anode circuit of valve V3 is 85 kc/s. IF1A (L44) and on all other ranges it is 700 kc/s. IFA and is selected by SWA1 and SWA4.

The 700 kc/s. I.F. consists of two pairs of circuits, 700 kc/s. IFA and B, inductively coupled by the coupling winding on L41. The coupling between the primary and secondary tuned circuits in each of the assemblies is switched by SWF1 and 2, giving two bandwidths, 14 kc/s. and 8 kc/s. The 14 kc/s. bandwidth is in use when the passband switch is in the "Wide" or "Intermediate" positions and the 8 kc/s. bandwidth is in use when the passband switch is in the "Narrow" or "Very Narrow" positions. These conditions enable the fine tuning control to be used without greatly modifying the overall response.

The output of the 700 kc/s. IFB is fed into the 2nd frequency changer valve V5 whose anode circuit is 85 kc/s. IF1A. This circuit on ranges 1, 3, 4 and 5 is the anode circuit of V3 and is therefore common to all ranges, being connected via SWA4. In the "Wide" position of the passband switch the signal is fed via the coupling winding of L44 and switch wafers SWG1 and SWG3 to L471; SWG1 selects the required coupling of L44. The coupling winding of L56 is permanently connected to L47 but the primary of L56 is open-circuited on all bandwidths except "Narrow". The signal path for the "Intermediate" position of the passband switch is the same as for "Wide" except that it is fed via switch SWG2 as well as SWG1 and SWG3.

In the "Narrow" position the coupling from L44 is selected by SWG1, passed to SWG3 and hence to L56 which is coupled into L47. The lower end of the coupling winding of L56 is earthed by switch SWG4.

In the "Very Narrow" position of the passband switch the appropriate coupling winding of L44 is connected via SWG2 to a magnetostrictive resonator IF1B comprising L57 as the primary and L46 the secondary. The secondary winding of this resonator is connected via switch wafers SWG1 and SWG3 to L47 in IF1C. The secondary winding of a neutralising transformer L45 is connected in series with the secondary of the magnetostrictive resonator circuit. This feeds a voltage equal to, but in opposite phase to, the voltage produced by the residue inductive coupling between the primary and secondary windings of the magnetostrictive resonator, and thus neutralises this residue coupling, producing a symmetrical response in the "Very Narrow" position. The primary winding of the neutralising transformer L45 is permanently fed from the coupling winding of L44.

The ouput of the 85 kc/s. IF1C is fed to the grid of the 1st I.F. amplifier V6, a W77 valve, whose anode circuit, transformer IF2, comprises L49, L50, C114, C118 and C117. The selectivity of this transformer is switched by the passband switch wafer SWG5 using the coupling winding of L49. Switch SWG6 introduces a capacitor, C117, in series with C118 in the "Wide" position of the switch. This reduces the effective tuning capacity and compensates for the extra inductance of the coupling winding. Switch SWA3 short-circuits the coupling winding of L49 in the "Wide" and "Intermediate" positions of the passband switch when the range switch is set to ranges 1 and 2; this reduces the gain of the receiver considerably under these conditions. The "Wide" and "Intermediate" passbands are of no value at frequencies below 100 kc/s. The gain of V6 is controlled by potentiometer RV3 in the cathode line, which is ganged to RV2.

The 2nd I.F. amplifier V7 employs a Z77 valve whose anode circuit is IF3; this circuit has no passband switching. In the "Intermediate" position of the passband switch an additional cathode bias resistor R32 is switched in series with R31 by passband switch wafer SWG7 to minimise differences in gain on the four passband positions.

4.1.4. Final Detector

The final I.F. tuned circuit, IF3, is centre tapped, the two halves feed the two halves of the double diode valve V8. When the receiver system switch is set to C.W. these diodes act as a balanced demodulator. On modulated C.W. reception one diode only is used while the other is held non-conducting by applying a positive potential to its cathode, this is done by means of the H.T. potential divider R52, R47; resistor R47 is shorted out by the system switch wafer SWH3 in the C.W. position where no cathode potential is required. The advantage of this balanced demodulator is the elimination of M.C.W. interference and interference produced by an adjacent unwanted carrier beating with the wanted carrier. R.F. filtering circuits are included in the demodulator and balancing is by means of potentiometer RV4.

4.1.5. A.G.C. and Noise Limiter

Following the final detector is a pulse noise limiter consisting of two selenium diodes, MR3 and MR4, connected in series and designed to suppress both positive and negative noise peaks. The noise limiter diodes, which are conducting except during noise periods, derive their controlling bias from the rectified output of the diode MR6, which is also used for A.G.C. purposes. The noise limiter is switched in or out of circuit by the A.G.C./noise limiter switch wafer SWJ3.

R.F. is taken from the anode of the 2nd I.F. amplifier valve V7 and applied to MR5 and MR6 to produce the A.G.C. voltage. Rectifier MR6 is used to provide the controlling bias for the noise limiters and an A.G.C. voltage to the grid of the 1st I.F. amplifier valve V6, via switch wafer SWJ1. No delay voltage is applied to this A.G.C. rectifier, which works into a filter of normally long time constant, although there is a small delay due to the rectifier itself. In the off position of the A.G.C. switch the A.G.C. line to V6 is disconnected from the rectifier and connected to chassis via resistor R80, by SWJ1.

The rectifier MR5 provides delayed A.G.C. to the 1st and 2nd R.F. amplifier valves V1 and V2 via switch SWJ2; the A.G.C. to V1 is partial, as well as delayed, due to the potential divider R78, R132 referred to in section 4.1.1. The delay on MR5 is by a voltage divider R95, R96 connected across the 110 volts H.T. line and is of the order of 6 to 7 volts. Until the negative D.C. exceeds the positive delay voltage the A.G.C. rectifier MR5 is held non-conducting.

In addition to the delayed A.G.C. system used on V1 and V2, MR2 allows a desensitising voltage to be applied from the transmitter, on voice operated carrier operation, which operates on the A.G.C. line but yet enables A.G.C. or desensitising bias to be effective independently. This is achieved by feeding each voltage to the A.G.C. line via a one-way device, diode MR1 in the case of A.G.C. and MR2 for desensitising. These effectively isolate the two sources of bias one from the other, and allow the larger voltage to override and be operative on the A.G.C. line. The A.G.C. line to the R.F. valves is of short time constant and the filters in the V.O.C. desensitising line, fed via pin 8 of plug PLC, are also of short time constant so that the desensitising voltage operates on the controlled valves very quickly. The A.G.C. rectifier filter, however, has a much longer time constant so that the application and decay of A.G.C. voltage is much slower.

4.1.6. Beat Frequency Oscillator

An 86 kc/s. beat frequency oscillator stage is incorporated in the receiver for C.W. reception. This stage uses a triode heptode valve, V9, type ECH81 (or X719), the triode portion being used as the oscillator. The oscillator output is coupled into the heptode portion electronically and the final output taken from across resistor R38. The B.F.O. output is injected into the centre of the final I.F. tuned circuit L52. This mode of injection is necessary for balanced demodulation and in addition has the advantage of minimising the possibility of the B.F.O. voltage being transferred back into the previous tuned circuit and so operating the A.G.C. system.

4.1.7. A.F. Stages

The 1st A.F. amplifier V10 is a double triode valve type 6060 (or B309), the two triode portions being connected in cascade. The A.F. gain control RV1 is connected in the grid circuit of the first diode. Filtering of the low and high audio frequencies in this stage reduces undesired hum and assists in stabilising the receiver when tuned to the lower R.F. frequencies. The output of V10 is fed to the grid of the output amplifier valve V11 (N37) where sidetone from the transmitter is also applied via resistor R71 from pin 11 of plug PLC. The anode circuit of V11 consists of the output transformer TR1 which couples the output to the 'phone jacks JKA and JKB and loudspeaker terminals, and also provides an output to the transmitter handset terminals. The external loudspeaker or internal loudspeaker, if fitted, is automatically muted when plugging into a 'phone jack and the output to the loudspeaker is transferred into a dummy load, resistor R77.

4.1.8. Crystal Calibrator Oscillator

A crystal controlled oscillator circuit embodying a type Z77 valve V8, provides an internal source of checking signals. The fundamental frequency of the oscillator is 700 kc/s. and it provides artificial signals at harmonics of this frequency up to the frequency limit of the receiver, 28 Mc/s. The oscillator is switched into circuit in the "Calibrate" position of the system switch SWH. Switch wafer SWH1 connects H.T. to the oscillator while H.T. is disconnected from the 1st and 2nd R.F. stages V1 and V2; only very strong signals will be received in this position. On "Calibrate", switch wafer SWH2 disconnects the B.F.O. and SWH3 biases one detector. The fundamental of the 700 kc/s. oscillator is used as the B.F.O.

4.1.9. Gain Controls

The R.F. gain control comprises potentiometers RV2 and RV3, which are ganged, connected between the 110V H.T. line and chassis, via resistors R107 and R135 respectively. Potentiometer RV2 controls the gain of the R.F. valves V1 and V2 and RV3 controls the 1st stage I.F. V6. Potentiometer RV2 is inverse log law and RV3 log law, consequently for the first part of its travel RV3 reduces the gain of the I.F. stage more quickly than RV2 operating on V1 and V2 and this maintains a high signal to noise ratio. When the frequency changer and I.F. noise has reached a very low level then RV2 takes control and reduces the gain on the R.F. valves considerably, thus helping to reduce cross-modulation and blocking. Resistor R106 is connected in series with RV2 and RV3 and chassis during desensitising of the receiver so that the voltage between the gain control potentiometers and chassis is sufficient to cut off valves V1, V2 and V6.

A.F. gain in the receiver is controlled by the potentiometer RV1 in the grid circuit of V10.

4.1.10. Receiver Desensitising and Protection

These circuits protect the receiver from excessive transmitter voltages when the receiver is used in conjunction with a transmitter and reduce the gain of the receiver during transmission. The receiver may be desensitised in two ways, one where 24 volts is available and the other where no 24 volts is available and back contact key desensitising is used. Protection is provided only when the high speed relays are used when 24 volts is available.

Where 24 volts is available relays RLA and RLB are used. While transmission is in progress 24 volts is applied to the relay coils from the transmitter key, via pin 7 of plug PLC, and the relays operate. When operated, contact RLA1 disconnects the input circuits from the aerial and the aerial is taken to earth via resistor R5. Contact RLB1 removes the short to chassis across resistor R106 in the gain control circuit so that the voltage, with respect to chassis, on the sliders of RV2 and RV3 is increased sufficiently to cut off the R.F. valves V1 and V2 and the I.F. valve V6, thus muting the receiver.

When the receiver is used with the "Globespan" type 1232A transmitter on V.O.C. operation, a desensitising bias is applied to the receiver A.G.C. line from the transmitter, via pin 8 of plug PLC while speaking, and 24 volts is also applied to the relays.

Where no 24 volts is available from the transmitter relays, RLA and RLB are not used. The back contact of the transmitter key is connected via pin 10 of PLC to the junction of R106 and RV2, RV3. In the "key up" condition this line is at chassis potential and R106 is shorted out, the receiver operating normally. In the "key down" position, that is during transmission, the chassis short is removed by the key contact and R106 is connected in series with RV2 and RV3, and the same conditions exist as described in the previous paragraph for 24 volts desensitising. For back contact desensitising, the link between pin 10 of PLC and relay contact RLB1 must be removed otherwise the desensitising line is permanently connected to chassis, as RLB1 contact does not operate and the key contact will have no effect. This method of desensitising can only be used when the chassis is at earth potential as the key bar is normally earthed.

4.1.11. Muting Circuit

The receiver system switch has been designed to allow the inclusion of a muting circuit which can be added to the receiver. The action of this circuit, in conjunction with suitable settings of the gain controls, eliminates normal receiver noise which is present both when tuning between stations and when tuned to a station in the absence of a carrier from that station. In practice, therefore, a station can be monitored and in the periods between transmissions the monitoring receiver is silent, since the A.F. gain of the receiver is decreased by approximately 20 dBs.

4.1.12. H.T. and L.T. Supplies

An H.T. of 110 volts D.C. and L.T. of 110 volts D.C. or A.C. depending on mains supply, is used throughout the receiver except for the 1st and 2nd frequency changers and oscillators where a stabilised H.T. supply of 75 volts is used. This stabilised 75 volts is derived from the voltage stabiliser valve V12 which is connected in series with a 1k Ω resistor R76 across the H.T. line.

The 110 volts supply to the receiver is derived direct from the 110 volts D.C. mains or via one of the power units which operate from A.C. or D.C. mains; when using the A.C. unit the L.T. supply to the receiver is 110 volts A.C. The mains supply is fed direct into the receiver via terminals 1 and 2 and pins 1 and 6 of plug PLB respectively to the mains ON/OFF switch SWK. It is then fed back to the terminal block, terminals 3 and 4 via pins 2 and 5 of plug PLB, where it is either passed to the power unit or in the case of 110 volts D.C. to the H.T. line, etc. The appropriate connections are made by linking at the terminal block and reference should be made to drawing WZ.14297/D sheet 2 which shows the connections for various supplies.

The valve heaters and scale lamps are all connected in series across the 110 volts line, thermistors R87 and R89 limit the current to the heaters during the initial warming-up period.

4.2. POWER SUPPLY UNITS

Where 110 volts D.C. is not available the receiver may be operated with one of the following types of power units depending on the supply.

Type 2202A	A.C. input
Type 2203A	24 volts D.C. input
Resistor Unit ("Berco" UGHK5/SA69)	220 volts D.C. input

The A.C. power unit type 2202A is suitable for operation from 115 volts or 220-250 volts 50/60 c/s. A.C. mains, the latter supply in 10 volt steps. A circuit diagram of this unit is shown on drawing WZ.14312/B sheet 1. The mains input is fed to terminals 5 and 3 on this unit and then to the appropriate taps on the primary winding of the mains transformer TR1. The secondary of this transformer has two windings, one is a 110 volts A.C. winding which supplies the receiver valve heaters via terminal 8 and the other is 115-0-115 volts which in conjunction with rectifiers MR1 and MR2 forms a full-wave rectifier circuit with capacitor input filter C1 and provides 110 volts D.C. H.T. to the receiver. When the A.C. power unit is used a $32\mu F$ capacitor is connected in parallel with C156 in the receiver smoothing circuit to provide extra smoothing. This capacitor is supplied with the power unit and is mounted in the receiver cabinet, being connected to terminal 9.

The type 2203A power unit operates from 24 volts D.C. and has an output of 110 volts D.C., for the circuit diagram see drawing WZ.14363/B sheet 1. This unit employs a rotary transformer TR1 which includes R.F. filter circuits in the input and output lines.

When 220 volts D.C. mains are available a resistor unit may be used to obtain the necessary 110 volts D.C. for the H.T. and L.T. supplies to the receiver.

4.3. REJECTOR UNIT TYPE 2361 SERIES

The function of this rejector unit is to attenuate, on duplex operation, the inherent pick-up by the receiving aerial of the local transmitted carrier, thus allowing reception of signals with relatively close frequency separation from the local transmission.

Full details of this unit may be obtained from the rejector handbook ref. G.4.

SECTION V

INSTALLATION

WARNING.—*Due to the use of D.C. mains supplies to operate the receiver, certain parts of the metal chassis are at mains potential. Whenever it is necessary to handle the unit with mains supplies on, it is advisable to make sure that the part held is at earth potential. If in doubt a voltmeter test is a wise precaution.*

5.1. MOUNTING AND LOCATION

An outline of the receiver in the bench-type cabinet is shown on drawing WZ.13163/D sheet 1 which gives the fixing centres of the mountings.

A position should be selected for the receiver such that all controls on the front panel are easily accessible and enough space left at the rear and sides for feeding the external connections through the slot in the back panel and connecting the aerial and earth on the right-hand side.

Four wood screws, No. 12 rd. hd. $1\frac{1}{4}''$ long, are provided for fixing the mountings to the bench. First remove the chassis from the cabinet and locate the cabinet in the desired position. Four holes in the base of the cabinet coincide with the fixing holes in the mountings to enable a screwdriver to be used inside the cabinet without the need for removing the mountings.

For transport purposes an additional bracket secures the rear of the chassis to the cabinet. When first removing the chassis it is necessary to remove three screws from the rear base of the cabinet. It is then essential that the bracket should be completely removed from the chassis.

It is important that the receiver be correctly installed. The method of earthing is partly dependent on the associated transmitter facilities and it is important, therefore, that the appropriate installation diagram be adhered to. The receiver should be efficiently earthed, a copper strip being connected to the earth bolt on the right-hand side of the cabinet.

5.2. EXTERNAL CONNECTIONS

The external connections will depend upon the units associated with the receiver. The connections to the receiver terminal blocks and the inter-unit connections for various types of installations are shown on drawing WZ.14297/D sheet 2.

When an A.C. power unit is used with the receiver an additional 32μF. electrolytic capacitor is supplied. Fixing holes are provided for mounting this in the receiver cabinet and it should be connected as shown on the inter-unit connection diagram.

When the receiver is operating on A.C. mains it is advisable to disconnect capacitors C167 and C168 in the filter unit, the reason being that at 50 c.p.s. the comparatively low impedance of these capacitors appearing across phase to earth causes an earth indication at the main engine-room switchboard.

5.3. REJECTOR UNIT TYPE 2361 SERIES

The rejector unit is housed in a steel box which is suitable for mounting, by means of the four fixing bushes, on a bench, bulkhead or directly onto the side of the receiver cabinet.

In any installation, before choosing the actual position, it must be remembered that the output lead from the rejector to the receiver must be as short as possible and should not run close to the transmitter aerial lead or the aerial input lead of the rejector unit, otherwise direct coupling may occur.

In the case of an installation using manual selection where automatic transmitter control is not available the rejector unit must obviously be mounted in such a position that the operator can easily see the selector scale and readily operate the switch.

5.4. AERIAL

The length of aerial must be considered in conjunction with the amount of co-axial feeder used to connect it internally within the radio room.

The receiver input circuit is designed to operate satisfactorily with an input capacity varying between 250 and 800pF., this value includes the capacity of the co-axial cable where this is not correctly matched at the junction of the aerial to the feeder.

The capacity of the aerial itself can be approximately calculated by multiplying the length in feet by 2·3, the capacity of the co-axial cable can be ascertained from the maker's information sheet.

A typical example would be:—

60 feet of aerial	=	approximately 138pF.
30 feet of PT11M at 21pF. per foot	=	approximately 630pF.
	Total	768pF.

Unmatched co-axial cable must be considered as a capacity shunt across the receiver input. At frequencies below 4 Mc/s. the input impedance of the receiver rises as the frequency lowers and the shunt impedance of the co-axial cable tends to attenuate the incoming signal. Above 4 Mc/s. the input impedance of the receiver is lower (approximately 75 ohms.) and the shunt capacity has less effect. It follows therefore, that where the receiver has to operate on low frequencies every effort should be made to keep the length of the co-axial cable to a minimum.

When a matching unit type 2450A is employed at the junction of the co-axial lead and the aerial the length of the co-axial cable can readily be up to several hundred feet without serious loss of input signal. Where such matching is employed, it is necessary to earth the co-axial screening in the manner indicated on the appropriate installation drawing. The cable used for this purpose is preferably of the double screened type.

With unmatched co-axial feeder there is no point in extending the co-axial cable up the aerial since it is then no longer possible to adequately earth the screen covering which then tends to pick up "noise" which by transformer action, is transferred to the inner conductor. Unmatched co-axial cable should always be tested for "noise" with the receiver by disconnection of the "live" aerial. Where "noise" is found the co-axial screen should be earthed at the remote end and at other points in its run until the "noise" disappears.

When transmitters are associated with a receiver it is necessary to relate the "live" length of the receiver aerial with the transmitted frequencies. Aerial lengths which are quarter or half wave related to a radiated frequency are liable to have high voltage induced with possible damage to the receiver. This also applies in relation to the distance between the receiver aerial and transmitter downlead.

Radiated frequencies of 2-2·5 and 4 and 6 M/cs. are most liable to cause trouble with aerials of between 60 and 120 feet.

SECTION VI

SETTING-UP

6.1. RECEIVER

The receiver has been correctly set-up before despatch and will not require any initial adjustment providing it is installed correctly.

If back contact key desensitising is to be used instead of 24 volts desensitising the link between pin 10 of plug PLC and relay contact RLB1 must be removed.

6.2. POWER SUPPLY UNIT

If a power supply unit is used check that the taps on the mains transformers of the A.C. power unit are set for the correct supply.

6.3. REJECTOR UNIT TYPE 2361 SERIES

The H.F. rejector assembly, when fitted should not require any adjustment as it is pre-tuned before despatch. However, the I.F. band filters must be set-up to the channels available in the installation. Details of the setting-up procedure are given in the rejector instruction manual ref. G.4.

SECTION VII

OPERATION

Details of the operating procedure to be adopted are given in this section, together with details of the functions of the major controls.

7.1. OPERATING PROCEDURE

(*a*) Set the mains ON/OFF switch to "ON".
If an external power unit is used the supply is connected to this unit by the mains ON/OFF switch.

(*b*) Set SYSTEM switch to "C.W." or "PHONE", depending on the type of transmission it is desired to receive.

(*c*) Set A.G.C./N.L. switch to "A.G.C. & N.L. ON", except for the conditions given in section 7.2.2.

(*d*) Set PASSBAND switch to "WIDE" for best intelligibility of speech and when searching or to "INTERMEDIATE" or "NARROW" where interference is present. The "VERY NARROW" position is used on C.W. only.

(*e*) SET A.F. GAIN to approximately its mid-position and the R.F. GAIN nearly fully clockwise.

(*f*) Turn the RANGE switch to the frequency band required.

(*g*) Tune to the required frequency on the drum by means of the tuning control. On range 2 and ranges 6 to 10 ensure that the FINE TUNING control is at 0 so that final adjustment can be made with this control. For bandspread operation see section 7.7; the bandspread control should be out for general tuning.

(*h*) When the required signal is heard adjust the A.F. GAIN for a suitable level.

7.2. CONTROL OPERATION

7.2.1. Passband Switch

Four positions are provided. The "Wide" position gives best intelligibility of speech and makes tuning broader, this is useful for searching purposes. It can only be used when little interference is present.

The "Intermediate" and "Narrow" positions progressively narrow the passband so reducing interference but the signal must be tuned more carefully and accurately. The "Very Narrow" position demands very careful tuning and must only be used for C.W.

7.2.2. A.G.C./N.L. Switch

The usual position for this switch is at "A.G.C. & N.L. ON".

The A.G.C. should only be switched off for weak C.W. signals or if the wanted signal is weak and is adjacent to a strong interfering signal.

The noise limiter can normally be on as the insertion loss is very small and it introduces negligible distortion except in the case of deep modulation.

7.2.3. A.F. and R.F. Gain Controls

With the A.G.C. switched on, the R.F. gain control is normally set nearly fully clockwise, and the A.F. gain set to give a convenient output. With the A.G.C. off the gain is set to approximately its mid-position and the R.F. gain adjusted for a convenient audio output.

7.2.4. Tuning Control

A reduction ratio of 80 : 1 gives this control a smooth action for accurate tuning. For general tuning purposes the bandspread control handle is pulled out, it then becomes disengaged from the main tuning drive.

In order to record the tuning setting of a received transmission, the position of the pointer along the coarse logging scale on the escutcheon plate and the angular setting of the fine logging disc scale should be recorded. When this is done the exact tuning point may be re-set quickly when required. The setting of the fine tuning control, if used, should also be noted.

7.2.5. Fine Tuning Control

This is an electrical fine tuning control and enables a variation in tuning of ± 3 kc/s. on all frequencies above 800 kc/s. and also on the 25-100 kc/s. range.

This control should be set to zero during main tuning and then adjusted for fine tuning.

7.2.6. Bandspread Control

There are six black rectangular spots on the main scale drum corresponding to each of the six marine bands.

The bandspread scales expand these bands directly in frequency. The system switch is set to "Calibrate" and the receiver tuning pointer set on to one of these black spots. Rotate the tuning control until the calibrator oscillator is heard and tune this to the zero beat at the middle of the black spot. Rotate the bandspread control until the bandspread scale pointer coincides with the vertical continuous line towards the left end of the bandspread scale. When this position is reached and with the calibrator signal tuned to zero beat as mentioned above, the bandspread handle should be pushed in until it engages with the main tuning drive.

Now set the system switch to "C.W." or "Phone" and the bandspread is ready for use. The bandspread scales are calibrated directly in megacycles and enable the accurate pre-tuning of a hitherto unlogged station knowing only the frequency of the latter.

This setting remains accurate for some considerable time but it will have to be set-up again each time the receiver is switched on and also for each time a different bandspread scale is used.

It should be noted that in the "Calibrate" position of the system switch the receiver is "dead" to all but very strong signals, the aerial can be removed on "Calibrate" if these signals are troublesome.

7.2.7. Audio Output

Two 'phone jacks are provided on the front panel for low impedance 'phones. When these are removed from the jacks the output is automatically switched to the external loudspeaker or internal loudspeaker, if fitted. The output to the handset is independent of the 'phones and loudspeaker.

7.2.8. Calibrator

To operate the calibrator set the system switch to "Calibrate". This will cause a C.W. signal to be injected into the receiver circuits at every multiple of 700 kc/s. This provides a ready means of checking whether the calibration of the receiver is accurate and is used during the setting-up of the bandspread scale as described in section 7.2.6.

SECTION VIII

MAINTENANCE

WARNING.—*Due to the use of D.C. mains supplies to operate the receiver certain parts of the metal chassis are at mains potential. Whenever it is necessary to handle the unit with mains supplies on it is advisable to make sure that the part held is at earth potential. If in doubt a voltmeter test is a wise precaution.*

8.1. SAFETY PRECAUTIONS

If the receiver is withdrawn from the cabinet at any time for maintenance or inspection purposes, great care should be taken against accidental contact with high potential points. When the chassis is withdrawn the on/off switch should always be set to "OFF" as the chassis is live, engraving on the reflector plate behind the front panel gives warning of this. Even with the on/off switch on the front panel at "OFF" mains voltage is still present in the receiver, this should be switched off externally to make the receiver safe.

8.2. ROUTINE MAINTENANCE AND REPLACEMENT OF CONSUMABLE COMPONENTS

8.2.1. Fuse Replacement

Two fuses, connected in the mains input lines, are fitted on the front panel of the receiver. They are of the ceramic cartridge type and their ratings for various supplies are as follows:—

110, 220 volts D.C. ... ... 1 amp.
and
115 volts A.C.
24 volts D.C. ... ... 7·5 amps.

NOTE:—*When the receiver is operated on 24 volts, only one 7·5 amps. fuse should be used, in the left-hand holder. The right-hand holder should be empty.*

8.2.2. Valve Replacement

The valve heaters are connected in series across the 110 volts supply and consequently if one heater becomes open-circuited the remainder will not function. If loss of emission is suspected a substitution method of test may be carried out.

When the L.T. supply is D.C. and a heater is suspected of being open-circuited the valve heaters may be checked by using a type 1362A metering unit as follows. Plug the metering unit into metering socket SKG on the left-hand side of the chassis. A similar meter reading in positions 5 and 6 of the meter switch indicates a heater fault in V1, V2, V3, V4, V8 or V10, a meter reading in position 5 but not in position 6 indicates a fault in V5, V6, V7 or V9 while no meter reading in either position 5 or 6 indicates a fault in V11 or V13.

8.2.3. Scale Lamp Replacement

These lamps are connected in series with the valve heaters across the 110 volts supply. They are accessible immediately behind the front panel by withdrawing the chassis and removing the warning label. The lamp ratings are 4V.0.3A.

If either or both lamps burn out the receiver will continue to operate through resistors R83 and R84.

8.2.4. Lubrication

At intervals of three months (more frequently in tropical conditions) the oil reservoir in the capacitor drive spindles should be re-charged.

Removal of the capacitor cover will expose the capacitor drive, which should be rotated until one of the spindle oil holes (ringed with red paint) is uppermost. Wakefield "Oilit" is then dropped slowly into the oil hole until the wick will absorb no more. A length of 20 S.W.G. wire forms a convenient dropper. The procedure is then repeated for the remaining two spindles.

All other bearing surfaces, spindles, sliders, etc., are lubricated with Ragosine "Molybdenised Listate" grease during assembly and should not normally require attention. Should lubrication prove to be necessary, however, the above specified grease only should be sparingly applied.

If switches become stiff in operation the metal bearings and location balls may be lubricated with a very little thin oil.

The wafers may only be lightly lubricated with *high insulation grease* such as Midland "Silicone" MS4. No mineral oil or grease may be used for this purpose since it will seriously affect operation of the receiver.

8.2.5. Connections

Periodical checks should be made of all connections such as plugs and sockets and the external connections to the terminal blocks in the rear of the cabinet.

8.2.6. Replacing Drive Cords

The drive cord replacement diagrams are shown on drawing WZ.14128/D Sheet 1 and should be referred to when reading the following sections.

Access to all drive cords is obtained by removal of the front panel. This is achieved by removing all control knobs and the five larger round headed screws.

8.2.6.1. *Replacement of Calibration Drum Drive Cord*

The pulleys associated with this cord are shown in detail in Fig. 1 of drawing WZ.14128/D Sheet 1.

(*a*) Set range switch to position 1 and rotate the calibration drum to range 1.

(*b*) Remove the calibration drum by taking off the right-hand end bracket.

(*c*) Make a small loop approximately in the centre of the 4 ft. length of cord.

(*d*) Pass the loop through the hole in the rim of pulley Q and over the anchor pin.

(*e*) Replace the calibration drum, taking care that the $\frac{1}{8}''$ wide slot in the drum locates over the projecting pin on pulley Q, and replace the end bracket.

(*f*) Wind one end of the cord $1\frac{3}{4}$ turns in an anti-clockwise direction round pulley Q and pass the end over pulley B and round pulley D. Take $\frac{1}{4}$ turn in a clockwise direction round pulley E and feed the end through the hole in the rim.

(*g*) Take the other end of the cord in a clockwise direction round pulley Q and pass the end behind pulley A and round pulley C. Take $1\frac{1}{2}$ turns in an anti-clockwise direction round pulley E and feed the end through the hole in the rim.

(*h*) Holding both ends of the cord against the spring, estimate the required point of trying to put the spring in tension. Knot the cords together at two adjacent points to form a loop (temporarily releasing the cord from pulley D will assist in this). Remove the spring from its peg, hook it into the loop and re-attach to the peg. Check that the spring is in tension and the knots are secure, and remove surplus cord.

(*i*) The range indicated on the calibration drum should be lined up with the range indicated by the range switch by adjusting the position of pulley E on its spindle.

8.2.6.2. *Replacement of Calibration Pointer Drive Cord*

Reference should be made to Fig. 2 on drawing WZ.14128/D sheet 1 for details of this cord.

(*a*) Rotate the main tuning handle fully clockwise against its stop so that the pulleys take up their correct positions for cord replacement.

(*b*) Remove bandspread scale by taking out the four countersunk screws.

(*c*) Fit the loop in the new cord over the spring hook on the large pulley G driven from the main tuning spindle.

(*d*) Take the shorter end of the cord and pass it through the slot in pulley G and wind it approximately $\frac{1}{4}$ turn in an anti-clockwise direction round the pulley.

(*e*) Pass the cord round pulley F and fit the end to the pointer carriage.

(*f*) Take the longer end of the cord and wind it round pulley G for $1\frac{3}{4}$ turns in a clockwise direction, pass it over the jockey pulley H, round pulley J and fit the cord to the pointer carriage.

(*g*) Check that the position of jockey pulley H is low enough for the bandspread pointer to pass and high enough for sufficient tension in the cord.

(*h*) Finally check that with the tuning set fully anti-clockwise the pointer coincides with the extreme left end of the calibration scales. If not, the pointer may be adjusted by rotating pulley G on its spindle in the necessary direction.

(*i*) Replace bandspread scale.

8.2.6.3. *Replacement of Bandspread Pointer Drive Cord*

For details of the pulleys associated with this cord see Fig. 3 on drawing WZ.14128/D sheet 1.

This cord is fitted in almost the same manner as the calibration pointer drive cord.

(*a*) Rotate the bandspread control fully clockwise against its stop so that the pulleys take up their correct positions for cord replacement.

(*b*) Remove the bandspread scale by taking out the four countersunk screws.

(*c*) Fit the loop in the new cord over the spring hook on the small pulley M.

(*d*) Take the shorter end of the cord, pass it through the slot in pulley M and wind approximately 3 turns in an anti-clockwise direction round the pulley.

(*e*) Pass the cord over jockey pulley N, round pulley P and fit the end to the pointer carriage.

(*f*) Take the longer end of the cord and wind it approximately $\frac{1}{2}$ a turn in a clockwise direction round pulley M, then pass it over pulley L, round pulley K and fit to the pointer carriage.

(*g*) Adjust jockey pulley N to obtain a reasonable tension in the cord.

(*h*) Replace the bandspread scale.

(*i*) Finally check that the pointer travel corresponds with the bandspread scale. If not rotate pulley M on its spindle until it does.

8.3. VOLTAGE AND VALVE FEED CHECKS

The voltage tables were compiled from readings taken with a Model 8 Avometer (20,000 Ω/V).

For feed-metering readings, a meter unit type 1362A must be used.

The smoothed H.T. voltage at plug PLC pin 4 must be checked as the following figures are based upon a H.T. voltage of 105±5%.

8.3.1. Valveholder Voltage Table (see table 3 on page 24)

For these checks the following meter ranges are used:—

Above 30 volts	—	250 volts f.s.d.
15 to 30 volts	—	100 volts f.s.d.
5 to 15 volts	—	25 volts f.s.d.
Below 5 volts	—	10 volts f.s.d.

The readings marked * are heater voltages, and the values given are nominal. In fact, these voltages should differ by steps of 6·3 volts±10%, except for that voltage across V11, which should be 13·0 volts±10%. If a particular valve is found to give a voltage drop outside the above limits, that valve should be changed.

General tolerance ±10%. Reading at V12 pin 4 to be ±5%.

Table 3

Valveholder Voltage Table

Condition	*Pin*	*V1*	*V2*	*V3*	*V4*	*V5*	*V6*	*V7*	*V8*	*V9*	*V10*	*V11*	*V12*	*V13*
Normal	1	2·2	2·2	64·0	0	64·0	0	0	0·5	0	70·0	0	0	0
Switched to "CW"	1									72·0				
A.F. gain anti-clockwise ...	2	0	0	0	0	0	1·35	1·1	0	0	0	3·5	0	0
Switched to "Intermediate" ...	2							1·5						
Switched to "Calibrate" ...	2													0·8
Normal	3	2·2	2·2	1·15	0	2·0	44·1*	44·1*	12·6*	0	1·2	88·6*	0	63·0*
Normal	4	37·8*	31·5*	25·2*	18·9*	50·4*	37·8*	50·4*	6·3*	56·7*	6·3*	75·6*	70·0	69·3*
Normal	5	31·5*	25·2*	18·9*	12·6*	56·7*	96·0	98·0	45·0	63·0*	6·3*	95·0		
Switched to "CW"	5								8·0					
Switched to "Calibrate" ...	5													100
Switched to ranges 2, 6, 7, 8, 9 or 10	6	0	0	67·5	0	97·5	1·35	1·1	0	0	70·0			
Switched to ranges 1, 3, 4 or 5 ...	6			97·5		0								
Switched to "CW"	6									45				
A.F. gain anti-clockwise ...	7	80·0	80·0	0	49·0	0	96·0	98·0	0	0	0	88·0		
Switched to "Calibrate" ...	7													88·0
Normal	8	85·0	85·0	0	49·0	45·0					1·2			
Switched to "CW"	8									30·0				

Table 4

Feed Metering

Socket	*Position*	*Condition*	*Function*	*Valve Ref.*	*Scale*	*F.S.D.*	*Indicated Reading*	*True Value*	*Tolerance*
SKE	1	Normal	Unsmoothed H.T.		0-3	330V	1·00	110V	±5%
SKE	2	Normal	1st R.F. Amplifier	V1	0-10	11mA	6·0	6·6mA	±15%
SKE	2	Switched to ranges 3, 4, or 5, "Calibrate", or R.F. gain anti-clockwise	1st R.F. Amplifier	V1	0-10	11mA	0		
SKE	3	Normal	2nd R.F. Amplifier	V2	0-10	11mA	6·0	6·6mA	±15%
SKE	3	Switched to "Calibrate" or R.F. gain anti-clockwise	2nd R.F. Amplifier	V2	0-10	11mA	0		
SKE	4	Switched to ranges 2, 6, 7, 8, 9 or 10	1st Frequency Changer	V3	0-3	4·2mA	0·9 to 1·7*	1·26 to 2·38mA*	
SKE	4	Switched to ranges 1, 3, 4 or 5	1st Frequency Changer	V3	0-3	4·2mA	0		
SKE	5	Switched to ranges 2, 6, 7, 8, 9, 10 or 1, 3, 4, 5	1st Oscillator	V4	0-10	7·7mA	3·8 to 6·2*	2·92 to 4·75mA*	
SKE	6	Switched to ranges 2, 6, 7, 8, 9 or 10	2nd Frequency Changer	V5a	0-3	4·2mA	0·85	1·19mA	±15%
SKE	6	Switched to ranges 1, 3, 4 or 5	1st Frequency Changer	V3	0-3	4·2mA	0·9 to 1·7*	1·26 to 2·38mA	
SKF	1	Switched to ranges 2, 6, 7, 8, 9 or 10	2nd Oscillator	V5b	0-3	3·0mA	2·1	2·1mA	±20%
SKF	1	Switched to ranges 1, 3, 4, or 5	2nd Oscillator	V5b	0-3	3·0mA	0		
SKF	2	Normal	1st I.F. Amplifier	V6	0-10	11·0mA	3·3	3·6mA	±20%
SKF	2	R.F. gain anti-clockwise	1st R.F. Amplifier	V6	0-10	11·0mA	0		
SKF	3	Normal	2nd I.F. Amplifier	V7	0-10	11·0mA	3·0	3·3mA	±20%
SKF	3	Switched to "Intermediate"	2nd I.F. Amplifier	V7	0-10	11·0mA	1·5	1·65mA	±20%
SKF	4	Switched to "CW"	BFO Buffer	V9a	0-10	10·1mA	8·5	8·58mA	±15%
SKF	5	Switched to "CW"	BFO	V9b	0-3	1·3mA	1·0	0·43mA	±20%
SKF	6	Normal	A.F. Amplifiers	V10	0-3	4·2mA	0·55	0·77mA	±20%
SKG	1	Normal	Output Valve	V11	0-10	10·6mA	3·2	39·0mA	±20%
SKG	2	Switched to "Calibrate"	Calibrater	V13	0-3	4·6mA	1·0	1·53mA	±30%
SKG	5	Normal	Heaters—Group 2		0-3	330V	0·58	63·0V	±10%
SKG	6	Normal	Heaters—Group 1		0-3	330V	0·35	37·8V	±10%

8.3.2. Feed Metering Table (See table 4 on page 25/26)

Those readings marked thus * vary with the setting of the range switch between the limits stated.

When the first reading of the table (i.e., unsmoothed H.T.) is taken, a check must also be made of the figure using a model 8 "Avo" on the 250V range at PLB pin 3. These results should agree within ±5%.

8.3.3. Gain Control Voltages

All readings are to be made on the 100 volts range of the model 8 "Avometer".

Table 5

Condition	*Component*			*Voltage*
Normal	Slider of I.F. potentiometer (rear section)	—	Chassis	0
R.F. gain anti-clockwise	Slider of I.F. potentiometer (rear section)	—	Chassis	14·0±10%
Normal	Slider of R.F. potentiometer (front section)	—	Chassis	0
R.F. gain anti-clockwise	Slider of R.F. potentiometer (front section)	—	Chassis	26·0±10%
24 volts D.C. applied to desensitising relays	Either slider	—	Chassis	46·0±10%

8.4. PERFORMANCE CHECKS

The checks listed below should not be undertaken unless the necessary test equipment and skilled personnel are available. Alteration of trimmer condensers and inductance "slugs" should not be made unless clearly established as being necessary.

8.4.1. Audio Frequency Checks

Equipment required:—

Audio frequency oscillator
Power output meter

(*a*) The following tests cover the overall performance of the audio frequency stages. In the event of a fault, or if more detailed information is required, reference should be made to section 8.4.10.

(*b*) "Standard output" is to be 100mW. into 5 Ω. In order that the output meter may be plugged into the 'phone jacks without mis-matching, it is essential to disconnect the internal load resistor by insulating the "make" contacts on the jack assemblies.

(*c*) Injection to A.F. grids must be via the grid stoppers.

8.4.1.1. *A.F. Sensitivity*

Inject a signal of 1000 c/s. to the grid of valve V10a via a 0·1μF capacitor, the A.F. gain control being approximately in the mid-position. Check to table 6 on page 28.

Table 6

Output	*Input*	*Tolerance*
100 mW	·024V	±20%
1W	0·1V	±20%

8.4.1.2. *A.F. Response*

Inject a signal from the A.F. oscillator to the grid of valve V10a and set the output to 100 mW. Check the response to table 7.

Table 7

Frequency	*Response*	*Tolerance*
100 c/s.	−18·0 dB	±2 dB
300 c/s.	− 3·0 dB	±2 dB
500 c/s.	− 1·0 dB	±2 dB
1000 c/s.	0	
1500 c/s.	0	
2500 c/s.	− 2·0 dB	±2 dB
5000 c/s.	− 7·0 dB	±2 dB

8.4.1.3. *Sidetone Level*

Inject a signal at 1000 c/s. from the A.F. oscillator to terminal 21 in the rear of the cabinet. The input levels required for outputs of 50 mW. and 250 mW. should be respectively 12 volts±10% and 27 volts±10%.

8.4.2. Intermediate Frequency Checks

Equipment required:—

Power output meter
Valve voltmeters (normal and sensitive)
Signal generator
Tone generator.

The following tests cover the overall performance of the I.F. amplifier. Individual stage gains and bandwidths which will assist in fault finding, are given in Section 8.4.10.

The receiver should be set-up as follows, and should be returned to these conditions after each check:—

"Narrow" bandwidth
Range 3
"Phone"
AGC and NL switch "OFF".

Valve voltmeter connected across one half of the last I.F. transformer secondary.

Local oscillator shorted
R.F./I.F. gain control at maximum.

8.4.2.1. *85 kc/s. I.F. Alignment*

Inject a C.W. signal at approximately 85 kc/s. to the grid of valve V3 via a 0·1μF capacitor. If a very high input is required to give a reading on the valve-voltmeter, adjust L44, L56, L47, L49, L50, L51 and L52 approximately to tune.

Switch to "Very Narrow" and swing generator for maximum output, this is the frequency of the magnetostrictive resonator and should lie between 84·5 kc/s. and 85·5 kc/s. Switch back to "Narrow", align carefully L44, L56, L47, L49, L50, L51 and L52 for maximum reading on the valve-voltmeter. Then screw-in the core of L44 by one half turn, and screw-out the core of L47 by one half turn.

8.4.2.2. *I.F. Neutralising*

Switch to "Very Narrow", and measure the bandwidth at the 30 dB. points. The neutralising coil, L45, must be adjusted to make the bandwidth, at 30 dB. down, symmetrical about the resonator frequency.

8.4.2.3. *85 kc/s. I.F. Sensitivity*

The levels required at valve V3 grid, for a reading of 1 volt on the valve-voltmeter, should agree with the following table:—

Bandwidth	*Input*	*Relative Level*	*Tolerance*
Very Narrow (VN)		−8·0 dB	± 2dB
Narrow (N)	24μV	−5·0 dB	±25%
Intermediate (I)		−8·0 dB	±2 dB
Wide (W)		−2·0 dB	±2 dB

With the local oscillator working, these levels should be increased by about 7 dB. to restore the voltmeter reading.

8.4.2.4. *85 kc/s. I.F. Selectivity*

The response from valve V3 grid at 84 kc/s. should be as given below. Great care must be taken in measuring the "Very Narrow" bandwidth to eliminate the effects of generator drive backlash.

Attenuation	*Detune in c/s.*			
	VN	N	I	W
6 dB	±60±30	± 800±150	±2000±200	±4300+700 −200
30 dB	±650±80	±2000±200	±4000±500	±7000±1000

8.4.2.5. *Detector Efficiency*

With the A.F. gain control at maximum, and noise limiter "OFF", inject an unmodulated signal at 85 kc/s. to valve V7 grid and set a level of 1 volt at the detector valve-voltmeter. Modulation of this signal to 30% by 400 c/s. tone should result in an audio output of at least 100 mW.

8.4.2.6. *A.G.C. Voltage Checks*

(*a*) Inject a C.W. signal at 85 kc/s. at a level of 1 mV. to grid of valve V3. The A.G.C.2 voltage developed between chassis and pin 1 of the N.L. and A.G.C. can, measured with a D.C. voltmeter of not less than 5 M Ω impedance, should be between 30 to 36 volts. The I.F. voltage indicated on the valve-voltmeter across I.F.3 should be noted.

(*b*) A.G.C. is now switched "ON" and the input increased to restore the valve-voltmeter reading to that noted in (*a*). The increase in input level should be greater than 40 dB.

(*c*) With A.G.C. "OFF", the input is reduced until the A.G.C. 1 voltage at pin 2 of the N.L. and A.G.C., measured with the D.C. voltmeter referred to in (*a*), is 1 volt. The corresponding A.G.C. 2 voltage, measured at pin 1, should be between 5-10 volts.

8.4.2.7. *Detector Balance Adjustment*

For the duration of this operation, these conditions apply:—
The B.F.O. is rendered inoperative by shorting R43 (i.e. pin 3 86 kc/s. B.F.O. Can).
The valve-voltmeter across IF3 is removed.
A.G.C. is switched "ON".

Inject a modulated signal to valve V3 grid at a level of 100μV., and carefully tune the generator. Switch to "C.W." and increase input to 100 mV. Adjust RV4 to give minimum output, which should be less than 1 mW. As the generator is detuned, the output will rise, an increase of up to 12 dB. for a detune of 1 kc/s. is normal.

8.4.2.8. *B.F.O. Adjustment*

Inject a modulated signal to valve V3 grid, and set the generator switch to "C.W.", reduce input to approx. 10μV., and remove modulation. Adjust L53 to give zero beat. Now inject a 1,000 c/s. note from a tone generator via the sidetone circuit (PLC11 or case terminal No. 21) to give an output of about 50 mW., and **unscrew** the core of L53 to obtain zero beat between the beat note and the injected tone.

The B.F.O. voltage, measured between pin 6 IF3 and earth, using the valve-voltmeter, should be between 5 to 7 volts.

8.4.2.9. *Comparison of M.C.W. and C.W. Signals*

For this test the passband used is "Intermediate", the system switch is set to "C.W."

Inject a C.W. signal of 10μV. at 85 kc/s. to valve V3 grid and set output to 100 mW. Set system switch to "Phone", and modulate the input signal to 30%. The increase in input required to restore standard output should lie between 14-17 dB.

8.4.2.10. *85 kc./s. Switched I.F. Checks*

(*a*) Switch to range 6; render 615 kc/s. osc. inoperative by shorting "Fine Tuning" capacitor.

(*b*) Inject an 85 kc/s. unmodulated signal to the grid of valve V5 to give a level of 1 volt at the detector valve-voltmeter. The input required should be greater than that level obtained in section 8.4.2.3. The increase should be 3 dB.$\pm$2 dB.

(*c*) With 615 kc/s. oscillator running, the input should require to be increased by about 4 dB. to restore 1 volt at the valve-voltmeter.

(*d*) Check that on "WIDE" bandwidth, the response is in agreement with that obtained in section 8.4.2.4.

8.4.2.11. *700 kc/s. I.F. Alignment*

(*a*) Conditions as in section 8.4.2.10 (*a*). The valve -voltmeter is transferred from the detector to the grid of valve V5.

(*b*) Inject a signal to valve V3 grid at 700 kc/s., and (on "Narrow" bandwidth) adjust L40, L41, L42 and L43 for maximum reading on the valve-voltmeter.

(*c*) Switch to "Calibrate", when a beat note between generator and calibrator should be heard. Set generator to give zero-beat; return to "Phone", and repeat adjustments as (*b*) above.

(*d*) Check that the voltage developed across the calibrator crystal, measured with a valve-voltmeter, is 28 volts$\pm$20%.

8.4.2.12. *700 kc/s. I.F. Gain*

(*a*) Check the calibration of the valve-voltmeter against the generator at the 100 mV. level, and set the input valve V3 to give 100 mV. at the valve-voltmeter. This input should be between 8-12 mV. Now switch to "Wide", and reset valve-voltmeter reading to 100 mW. The decrease in input should not exceed 4 dB.

(*b*) With the local oscillator working, the input levels above should be increased by about 7 dB. to restore 100 mV. on the valve-voltmeter.

8.4.2.13. *700 kc/s. I.F. Selectivity*

Using the valve-voltmeter at valve V5 grid, and injecting a C.W. signal at valve V3 grid, the response of the 700 kc/s. filter should agree with the following table.

After this check it is essential that L43 is re-tuned as shown in section 8.4.2.15.

Attenuation	*Detune in kc/s.*	
	Narrow	*Wide*
6 dB.	± 3·8+1·0—0·4	± 7·5+1·0—0·5
30 dB.	±10·0±1·0	±15·0±1·5

8.4.2.14. 615 *kc/s. Oscillator Adjustment*

(*a*) Set the receiver up as in 8.4.2, except that range 6 is used, the fine tuning should be set to zero.

(*b*) Set the generator as in 8.4.2.11 (*c*); inject a C.W. signal to valve V5 grid, and adjust L48 to give maximum output on the valve-voltmeter (i.e. approx. 615 kc/s.).

(*c*) Check the rate and phrasing of the fine tuning control, rotation of the control to +1 kc/s., +2 kc/s., and +3 kc/s. should require the generator frequency to be reduced accordingly to maintain tune. Conversely the generator frequency should be increased when the control is set to —1 kc/s., —2 kc/s., and —3 kc/s.

(*d*) The level required at valve V5 grid for 1 volt at the valve-voltmeter should be between 60-150 μV.

The 615 kc/s. oscillator voltage, measured with the valve-voltmeter connected to the chassis and pins 7 or 9 of valve V5, should be between 3-4·5 volts.

8.4.2.15. *Overall I.F. Checks*

(*a*) With conditions as in 8.4.2.14 (*a*), inject a signal to valve V3 grid at the frequency determined in section 8.4.2.11 (*c*). Adjust L43 for maximum output on the valve-voltmeter.

(*b*) The input required for 1 volt at the valve-voltmeter should be between 6-15μV. Switching to "Wide" should require the input to be reduced by not more than 6 dB. to restore 1 volt at the detector.

(*c*) The bandwidth on "Wide" must be not less than 9 kc/s. at the 6 dB. points.

(*d*) With passband at "Wide", the increase in input to restore the valve-voltmeter reading to 1 volt, when the generator is set to the image frequency (i.e. 530 kc/s.), should be not less than 100 dB.

8.4.3. Frequency Changer Checks

8.4.3.1. *Alignment of First Oscillator*

(*a*) For this operation the receiver must be at a stable working temperature, i.e. to have been operating, in the case, for at least two hours.

(*b*) The temperature compensator should be set to a mean gap of ·048″, and sealed with an air drying varnish.

(*c*) Commencing with range 1, the oscillator should be set up to the top and bottom scale calibration points. When range 2 (trimmer capacitor under the chassis) has been completed, the bottom cover should be fitted before proceeding with the remaining ranges. After this operation, all trimmers should be sealed. Care should be taken to ensure that, on the higher frequency ranges, the image appears on the upper side of the signal.

(*d*) The voltage developed across the tuned circuit (i.e. between SWB1 long contact, and earth) should be as follows:—

Table 8

Range	*Frequency*	*Voltage*
1	15 kc/s.	14·0V.
	25 kc/s.	15·0V.
2	25 kc/s.	6·5V.
	100 kc/s.	9·5V.
3	100 kc/s.	13·0V.
	200 kc/s.	12·0V.
4	200 kc/s.	11·0V.
	400 kc/s.	10·0V.
5	400 kc/s.	9·5V.
	800 kc/s.	10·0V.
6	800 kc/s.	11·0V.
	1700 kc/s.	11·0V.
7	1·7 Mc/s.	6·5V.
	3·6 Mc/s.	7·0V.
8	3·6 Mc/s.	5·5V.
	7·5 Mc/s.	6·5V.
9	7·5 Mc/s.	5·5V.
	15·0 Mc/s.	8·0V.
10	15·0 Mc/s.	14·0V.
	25·0 Mc/s.	15·5V.

Variations in voltage up to ±20% are permissible.

(*e*) With the supply voltage reduced by 15%, the above voltages should fall by not more than 10%.

8.4.4. Signal Frequency Checks

8.4.4.1. *Alignment of S.F. Circuits*

(*a*) Align the S.F. circuits at the tracking points, these corresponding to logging scale readings given below. It will be found convenient to use "CW" and "Very Narrow" bandwidth for ranges 1 to 3, and above this "MCW" and "Narrow".

The dummy aerial specified must be used. I.F. and image rejection operations may both conveniently be carried out at this stage.

Table 9

Range	*Dummy Aerial*	*Bottom Tracking Point Logging Scale Reading*	*Top Tracking Point Logging Scale Reading*
1	300pF.	3·93	33·81
3	300pF.	3·7	36·0
4	300pF.	3·7	36·0
5	300pF.	3·7	36·0* (see para. (*c*))
6	300pF.	3·7* (see para. (*b*))	36·0
7	300pF.	3·7	36·0
8	75 Ω	3·7	36·0
9	75 Ω	3·7	36·0
10	75 Ω	3·46	36·0

(*b*) The I.F. rejector should now be adjusted. With the receiver set to the bottom tracking point of range 6, inject a signal at the frequency determined in 8.4.2.11 (*c*) (tune frequency to 700 kc/s. I.F.). Adjust L1 for minimum output, taking care that a false tune point (i.e. with core at maximum or minimum) is not obtained. In extreme cases, a change in the value of C1 may be necessary. Following this adjustment, the alignment of the associated S.F. circuit, L16 and C29, should be checked.

(*c*) The image rejector is set with the receiver at the top tracking point of range 5. A signal of image frequency (approximately 940 kc/s.) to this tune point is injected and L55 adjusted for minimum output. Care should be taken that a genuine tune is obtained, and in extreme cases, a change in the value of C50 may be necessary. The alignment of the following S.F. circuits, L23/C44, and L24/C46, should be checked.

(*d*) All trimmers should now be sealed.

8.4.4.2. *Noise Output Check*

(*a*) This check is intended as a guide to the step-ups, and the quality of tracking. The figures quoted show the order of noise output to be expected.

(*b*) The aerial/earth connection must be closed with the appropriate dummy aerial. The noise is measured as the voltage appearing across one half of the last I.F. transformer. The R.F. gain control should be at maximum, and the passband "Narrow". As the receiver is tuned over each range, the noise should (except on ranges 2 and 10) steadily increase with increasing frequency. There should be no violent fluctuation in the noise level at any point.

Table 10

Range	*Dummy Aerial*	*Tracking Point*	*Bandwidth*	*Noise Voltage*
1	300pF.	Bottom Top	Narrow Narrow	60-120mV 150-300mV
2	300pF.	Bottom Top	Narrow Narrow	100-200mV 60-120mV
3	300pF.	Bottom Top	Narrow Narrow	75-150mV 300-600mV
4	300pF.	Bottom Top	Narrow Narrow	140-300mV 0·9-1·8V
5	300pF.	Bottom Top	Narrow Narrow	200-400mV 300-700mV
6	300pF.	Bottom Top	Narrow Narrow	60-120mV 100-200mV
7	300pF.	Bottom Top	Narrow Narrow	80-160mV 100-200mV
8	75 Ω	Bottom Top	Narrow Narrow	100-250mV 150-350mV
9	75 Ω	Bottom Top	Narrow Narrow	40-100mV 100-200mV
10	75 Ω	Bottom Top	Narrow Narrow	40-120mV 50-150mV

8.4.4.3. *Image and I.F. Rejection*

(*a*) For these checks the A.F. gain control should be set to a "normal" position. This is determined as follows:—

Inject a modulated signal at a level sufficient completely to overload the receiver with A.G.C. "OFF", and R.F. gain control at "Maximum". Reduce the R.F. gain until the overload point is just cleared, the A.F. gain control having been set approximately midway. Now increase the A.F. gain until the A.F. overload point is reached. Note this point, and reduce the A.F. gain until the output is about 6 dB. below the overload point.

(*b*) The receiver is tuned to the frequency stated, and a signal injected at a level such that the R.F. gain reduction required to set "standard output" is a minimum, whilst still retaining a reasonable S/N ratio. The generator is then set to the appropriate image or intermediate frequency, and the input increased to restore "standard output". The change in generator level should be not less than that quoted in the table 11 for S.F. performance. It will be found convenient to use "C.W" and "Very Narrow" for ranges 1 and 2, and "MCW" and "Narrow" for the remainder.

8.4.4.4. *Signal/Noise Ratios*

(*a*) These checks are made under the conditions stated in S.F. performance table 11. The A.F. gain is set as in 8.4.4.3(*a*), and the R.F. gain used to set "standard output". Care must be taken when using the "Intermediate" bandwidth that the beat note giving the greater output is used as a tuning point.

(*b*) At each frequency of test a check should be made to ensure that the maximum audio output available for the specified input is of the order of 1 watt.

(*c*) It is emphasised that the limits set in the table of S.F. performance tests, table 11, are applicable to the stated frequencies only. The tracking points must not be used for these measurements.

Table 11

S.F. Performance Tests

Range	*Frequency*	*System*	*Bandwidth*	*Dummy Aerial*	*Input*	*Signal/Noise Ratio*	*Image Rejection*	*I.F. Rejection*
1	15 kc/s.	CW	Narrow	300pF.	20dB.	11dB.	100dB.	75dB.
	20 kc/s.	CW	Narrow	300pF.	20dB.	15dB.	95dB.	70dB.
	25 kc/s.	CW	Narrow	300pF.	20dB.	19dB.	95dB.	65dB.
2	25 kc/s.	CW	Narrow	300pF.	20dB.	15dB.	100dB.	85dB.
	60 kc/s.	CW	Narrow	300pF.	20dB.	19dB.	100dB.	80dB.
	100 kc/s.	CW	Narrow	200pF.	20dB.	23dB.	95dB.	75dB.
3	100 kc/s.	CW	Narrow	300pF.	20dB.	21dB.	95dB.	60dB.
	140 kc/s.	CW	Narrow	300pF.	20dB.	23dB.	90dB.	100dB.
	200 kc/s.	CW	Narrow	300pF.	20dB.	23dB.	86dB.	110dB.
4	200 kc/s.	CW	Intermediate	300pF.	20dB.	20dB.	90dB.	
	250 kc/s.	CW	Intermediate	300pF.	20dB.	24dB.	86dB.	
	400 kc/s.	CW	Intermediate	300pF.	20dB.	23dB.	90dB.	
5	400 kc/s.	CW	Intermediate	300pF.	20dB.	21dB.	90dB.	
	560 kc/s.	CW	Intermediate	300pF.	20dB.	21db.	85dB.	
	800 kc/s.	CW	Intermediate	300pF.	20dB.	22dB.	90dB.	
6	800 kc/s.	CW	Intermediate	300pF.	20dB.	18dB.	110dB.	90dB.
	1·2 Mc/s.	CW	Intermediate	300pF.	20dB.	22dB.	100dB.	100dB.
	1·7 Mc/s.	CW	Intermediate	300pF.	20dB.	26dB.	95dB.	110dB.
7	1·7 Mc/s.	CW	Intermediate	300pF.	10dB.	20dB.	110dB.	
	2·4 Mc/s.	CW	Intermediate	300pF.	10dB.	21dB.	100dB.	
	3·6 Mc/s.	CW	Intermediate	300pF.	10dB.	21dB.	80dB.	
8	3·6 Mc/s.	CW	Intermediate	75 Ω	10dB.	23dB.	95dB.	
	5·0 Mc/s.	CW	Intermediate	75 Ω	10dB.	24dB.	80dB.	
	7·5 Mc/s.	CW	Intermediate	75 Ω	10dB.	24dB.	60dB.	
9	7·5 Mc/s.	CW	Intermediate	75 Ω	10dB.	24dB.	75dB.	
	10·5 Mc/s.	CW	Intermediate	75 Ω	10dB.	24dB.	55dB.	
	15 Mc/s.	CW	Intermediate	76 Ω	10dB.	25dB.	45dB.	
10	15 Mc/s.	CW	Intermediate	75 Ω	10dB.	23dB.	55dB.	
	20 Mc/s.	CW	Intermediate	75 Ω	10dB.	23dB.	45dB.	
	28 Mc/s.	CW	Intermediate	75 Ω	10dB.	23dB.	30dB.	

8.4.5. Overall A.G.C. Checks

8.4.5.1. *A.G.C. Characteristic*

(*a*) Conditions of test:—
"Phone".
"Wide" passband.
RF gain control at maximum.
"A.G.C." on.

(*b*) Inject a modulated signal at 1·5 Mc/s. at a level of 30 dB. Set the audio output to 10 mW. by means of the A.F. gain control.

(*c*) Increase the input by 60 dB. (to 90 dB.). The resulting increase in output should not exceed 8 dB.

8.4.5.2. *Improvement of Signal/Noise Ratio*

(*a*) With conditions as in 8.4.5.1. (*a*), inject a modulated signal of 30 dBs. at 15·0 Mc/s. on range 10. Measure the S/N ratio.

(*b*) Increasing the input by 20 dB. (to 50 dB.) should result in an improvement of not less than 15 dB. on the S/N measured in 8.4.5.2.(*a*).

(*c*) In cases where the range of the output meter is restricted, and cannot cover the S/N obtained in 8.4.5.2. (*b*), the following method of measurement will be found convenient:—

(*d*) Tune carefully to centre of "Wide" passband, using a modulated signal. Remove modulation, set the A.F. gain to maximum and adjust input level to give a noise output of 0·1 mW. Reduce input by 20 dB. and note increase in noise output.

(*e*) Re-apply modulation and set output to 10 mW. by A.F. gain control. Increase input by 20 dB. to original level above, and note increase in output.

(*f*) The increase in output noted in 8.4.5.2. (*d*) plus the increase noted in 8.4.5.2. (*e*) gives the improvement in S/N as required in 8.4.5.2. (*b*).

8.4.6. C.W. Limiting and Stability

(*a*) Conditions of test:—
Range 7.
"A.G.C." off
"C.W."
"Wide"
R.F. gain control at maximum.

(*b*) Inject 1000 c/s. from a tone generator via the sidetone circuit.

(*c*) With a C.W. input of 30 dB. at 2 Mc/s., set the receiver to give a beat note of 1000 c/s. by comparison with the injected tone, then remove the tone generator input. Set the audio output to 100 mW.

(*d*) Increase the input by 60 dB. to 90 dB., whereupon the output should have increased by not more than 6 dB.

(*e*) Re-apply the signal from the tone generator to the sidetone circuit, and adjust the frequency to that of the receiver output i.e., to obtain a very slow beat on the output meter. The tone generator frequency should lie between the limits of 900 to 1100 c/s.

8.4.7. **Desensitising Checks**

(*a*) Conditions of test:—

Range 9
A.G.C. "OFF"
"Phone"
"Wide".

(*b*) Inject a modulated signal of 20 dB. at 8 Mc/s. and set audio output to 100 mW. by means of the A.F. gain control.

(*c*) Apply 24 volts between PLC7 and PLC2. The increase in input required to restore the output to 100 mW. should be not less than 110 dB.

(*d*) Remove "Desensitising Link". The increase in input to restore 100 mW. should be not less than 110 dB. Replace the "Desensitising Link".

(*e*) Apply 48 volts between chassis and PLC8, positive being connected to chassis. The increase in input to restore 100 mW. should be not less than 55 dB.

8.4.8. **Overall Distortion and Modulation Linearity**

(*a*) Conditions of test:—

Range 6
A.G.C. and N.L. "ON"
"Phone"
"Intermediate"
R.F. gain control at maximum.

(*b*) Inject a modulated signal (30%, 400 c/s.) of 80 dB. at 1 Mc/s., and set the output to 100 mW. The overall distortion, as measured on a distortion factor meter, should not exceed 5%.

(*c*) The depth of modulation is increased to 80%, when the audio output should increase by 6 to 7 dB. The overall distortion should now be less than 15%.

8.4.9. **Overall Tests**

8.4.9.1. *Signal/Noise Check*

The S/N figures given in S.F. performance tests, table 11 should be checked at two or three frequencies, and should have been reduced by not more than 1 dB. by the presence of the case wiring.

8.4.9.2. *Calibration Checks*

For this check, the receiver must be at a stable operating temperature, i.e., switched on for at least two hours.

Using a crystal calibrator, check that the main calibration points on each range are correct within ±12 divisions of the logging scale. It is convenient to use "Very Narrow" for the lower ranges and "Narrow" for the remainder.

For each bandspread range, the bandspread drive is engaged thus:—

(*a*) Switch to "Calibrate", and tune to zero beat within the appropriate band indicated by the main tuning scale band marker.

(*b*) Without disturbing the main tuning, set the bandspread pointer to the datum line, and engage the bandspread clutch.

(*c*) Again using the crystal calibrator check that the bandspread scale calibration is correct within ±2·5 divisions of the logging scale.

(*d*) At the 7 Mc/s. point, switch to "Very Narrow", and tune for maximum output. Switch to "Calibrate" and "Intermediate", when a beat note should be heard, this should not exceed 1500 cps.

(*e*) Check that signals due to the internal calibrator are clearly heard at intervals of 700 kc/s. up to 28 Mc/s.

8.4.10. Fault Finding Checks

In the event of the equipment failing to operate, reference to the tables and information set out in this section should enable the operator to locate the defective part of the circuit.

8.4.10.1. *A.F. Sensitivity*

Check at 1000 c/s. to table below:—

Table 12

Output	*V10a Grid*	*V10B Grid*	*V11 Grid*	*Tolerance*
100 mW. 1W.	0·024 V. 0·1 V.	0·055 V. 0·22 V.	0·7 V. 2·5 V.	±20%

8.4.10.2. *A.F. Response*

Table 13

Frequency	*V10a Grid*	*V10b Grid*	*V11 Grid*	*Tolerance*
100 c/s.	−18·0 dB.	−12·5 dB.	−8·5 dB.	
300 c/s.	− 3·0 dB.	− 2·5 dB.	−2·0 dB.	
500 c/s.	− 1·0 dB.	− 1·0 dB.	−1·0 dB.	
1000 c/s.	0	0	0	±2 dB.
1500 c/s.	0	0	0	
2500 c/s.	− 2·0 dB.	− 1·0 dB.	0	
500 c/s.	− 7·0 dB.	− 3·0 dB.	0	

8.4.10.3. *A.F. Distortion*

Using a distortion factor meter type TF 142E, the distortion at 1000 c/s. should be as in the following table:—

Table 14

Output	*V10a Grid*	*V10b Grid*	*V11 Grid*	*Tolerance*
100 mW. 1W.	2·0% 11%	4·6% 11%	2·0% 11%	±20%

8.4.10.4. *Detector Filter Loss*

Measured at 1000 c/s. with output set to 100 mW., the loss from valve V10a grid to Pin 7, valve V8 (with A.F. gain at maximum) should be 14 dB. ±1 dB. With noise limiter "ON", the loss should be 21 dB. ±2 dB.

8.4.10.5. *I.F. Sensitivity*

Measured as in section 8.4.2.3.

The input required for 1 volt at the detector valve-voltmeter:—

Table 15

Bandwidth	*V7 grid*	*V6 grid*	*Tolerance*
Very Narrow	0	0	
Narrow	22 mV	450 μV	±20%
Intermediate	+3·5 dB.	+2·0 dB.	
Wide	0 dB.	+3·0 dB.	

8.4.10.6. *I.F. Selectivity*

Measured as in section 8.4.2.4.

(*a*) From valve V7 grid:—

Table 16

Attenuation	*Narrow*
6 dB.	±2·1 kc/s.
30 dB.	±13·0 kc/s.

(*b*) From valve V6 grid:—

Table 17

Attenuation	*Narrow*	*Intermediate*	*Wide*
6 dB.	± 1 kc.	±2·0 kc/s.	±4·2 kc/s.
30 dB.	±3·8 kc/s.	±5·3 kc/s.	±9·0 kc/s.

8.4.10.7. *KQ Values*

If the performance of the I.F. can assemblies is suspected, the KQ values may be checked in situ, and should agree with the following tables (±15%):—

Table 18

Assembly	*Bandwidth*	*Input*	*Output*	
I.F. 1A & 1C	Narrow	Forward "1A" 1* to "1A" 3	Chassis* to "1C" 3	0·47
		Reverse Chassis* to "1C" 3	"1A" 1* to "1A" 3	0·42
I.F. 1A & 1C	Narrow	Forward "1A" 1* to "1A" 3	Chassis* to "1C" 1	0·2
		Reverse Chassis* to "1C" 1	"1A" 1* to "1A" 3	0·18†
I.F. 1C	Narrow	Forward Chassis* to "1C" 3	Chassis* to "1C" 1	0·5
		Reverse Chassis* to "1C" 1	Chassis* to "1C" 3	0·47
I.F. 1A & 1C	Intermediate	Forward "1A" 1* to "1A" 3	Chassis* to "1C" 1	1·5
		Reverse Chassis* to "1C" 1	"1A" 1* to "1A" 3	1·5†
	Wide	Forward "1A" 1* to "1A" 3	Chassis to "1C" 1	3·8
		Reverse Chassis* to "1C" 1	"1A" 1* to "1A" 3	3·8†
I.F.2	Narrow	Forward "I.F.2" 1 to "I.F.2" 5*	Chassis* to "I.F.2" 8	0·45
		Reverse Chassis* to "I.F.2" 8	"I.F.2" 1 to "I.F.2" 5*	0·45
	Intermediate	Forward "I.F.2" 1 to "I.F.2" 5*	Chassis* to "I.F.2" 8	1·6
		Reverse Chassis* to "I.F.2" 8	"I.F.2" 1 to "I.F.2" 5*	1·6
	Wide	Forward "I.F.2" 1 to "I.F.2" 5*	Chassis* to "I.F.2" 8	3·8
		Reverse Chassis* to "I.F.2" 8	"I.F.2" 1 to "I.F.2" 5*	3·8
I.F.3	Narrow	Forward "I.F.3" 3* to "I.F.3" 1	"I.F.3" 6* to "I.F.3" 5	0·55
		Forward "I.F.3" 3* to "I.F.3" 1	"I.F.3" 6* to "I.F.3" 7	0·55
		Reverse "I.F.3" 6* to "I.F.3" 5	"I.F.3" 3* to "I.F.3" 1	0·85
		Reverse "I.F.3" 6* to "I.F.3" 7	"I.F.3" 3* to "I.F.3" 1	0·85

NOTE.—(*a*) *Connections marked thus * are earthy.*
(*b*) *Due to presence of C112, figures marked † are not true KQ measurements, but the indicated levels are correct.*

Table 19

700 kc/s. I.F.

Assembly	*Bandwidth*	*Input*	*Output*	
I.F.A.	Narrow	Forward 1A* to 3A	Chassis* to 7A	1·0
		Reverse Chassis* to 7A	1A* to 3A	0·3
	Wide	Forward 1A* to 3A	Chassis* to 7A	3·0
		Reverse Chassis* to 7A	1A* to 3A	1·0
I.F.A. & I.F.B.	Narrow	Forward Chassis* to 7A	1B* to 3B	0·9
		Reverse 1B* to 3B	Chassis* to 7A	0·9
	Wide	Forward Chassis* to 7A	1B* to 3B	0·9
		Reverse 1B* to 3B	Chassis* to 7A	0·9
I.F.B.	Narrow	Forward 1B* to 3B	Chassis* to 7B	0·9
		Reverse Chassis* to 7B	1B* to 3B	0·9
	Wide	Forward 1B* to 3B	Chassis to 7B	1·8
		Reverse Chassis* to 7B	1B* to 7B	1·8

NOTE.—*Connections marked * are earthy.*

8.4.10.8. *700 kc/s. Conversion Efficiency*

Range 6.

"Narrow".

Inject a signal at 85 kc/s. to grid of valve V5 and set 1 volt on detector valve-voltmeter.

With the generator retuned to 700 kc/s., the increase in input level to restore 1 volt should be approximately 8 dB.

8.4.10.9. *Mixer Efficiency*

Inject a signal to the grid of valve V3 at the appropriate I.F. frequency and set to give a level of 1 volt at the detector valve-voltmeter.

Retune generator to the appropriate signal frequency and check that the increase in input required to restore 1 volt does not exceed the levels of table 20.

Table 20

Range	*I.F. Frequency*	*Input*	*S.F. Frequency Level*
1	85 kc/s.	50 μV.	15 kc/s. +6 dB.
		55 μV.	25 kc/s. +6 dB.
2	700 kc/s.	25 μV.	25 kc/s. +6 dB.
		25 μV.	100 kc/s. +4 dB.
3	85 kc/s.	45 μV.	100 kc/s. +3 dB.
		55 μV.	200 kc/s. +4 dB.
4	85 kc/s.	45 μV.	200 kc/s. +3 dB.
		55 μV.	400 kc/s. +4 dB.
5	85 kc/s.	50 μV.	400 kc/s. +4 dB.
		40 μV.	800 kc/s. +4 dB.
6	700 kc/s.	35 μV.	800 kc/s. +2 dB.
		30 μV.	1700 kc/s. +2 dB.
7	700 kc/s.	20 μV.	1·7 Mc/s. +4 dB.
		25 μV.	3·6 Mc/s. +3 dB.
8	700 kc/s.	20 μV.	3·6 Mc/s. +4 dB.
		20 μV.	7·5 Mc/s. +4 dB.
9	700 kc/s.	35 μV.	7·5 Mc/s. +5 dB.
		30 μV.	15·0 Mc/s. +5 dB.
10	700 kc/s.	35 μV.	15·0 Mc/s. +8 dB.
		40 μV.	28·0 Mc/s. +9 dB.

NOTE.—*To avoid a series resonance on range 6, C53 should be short-circuited.*

8.4.10.10. *Signal Frequency Step-ups*

R.F. gain control shorted out. (front section).

A.F. gain set to "Normal".

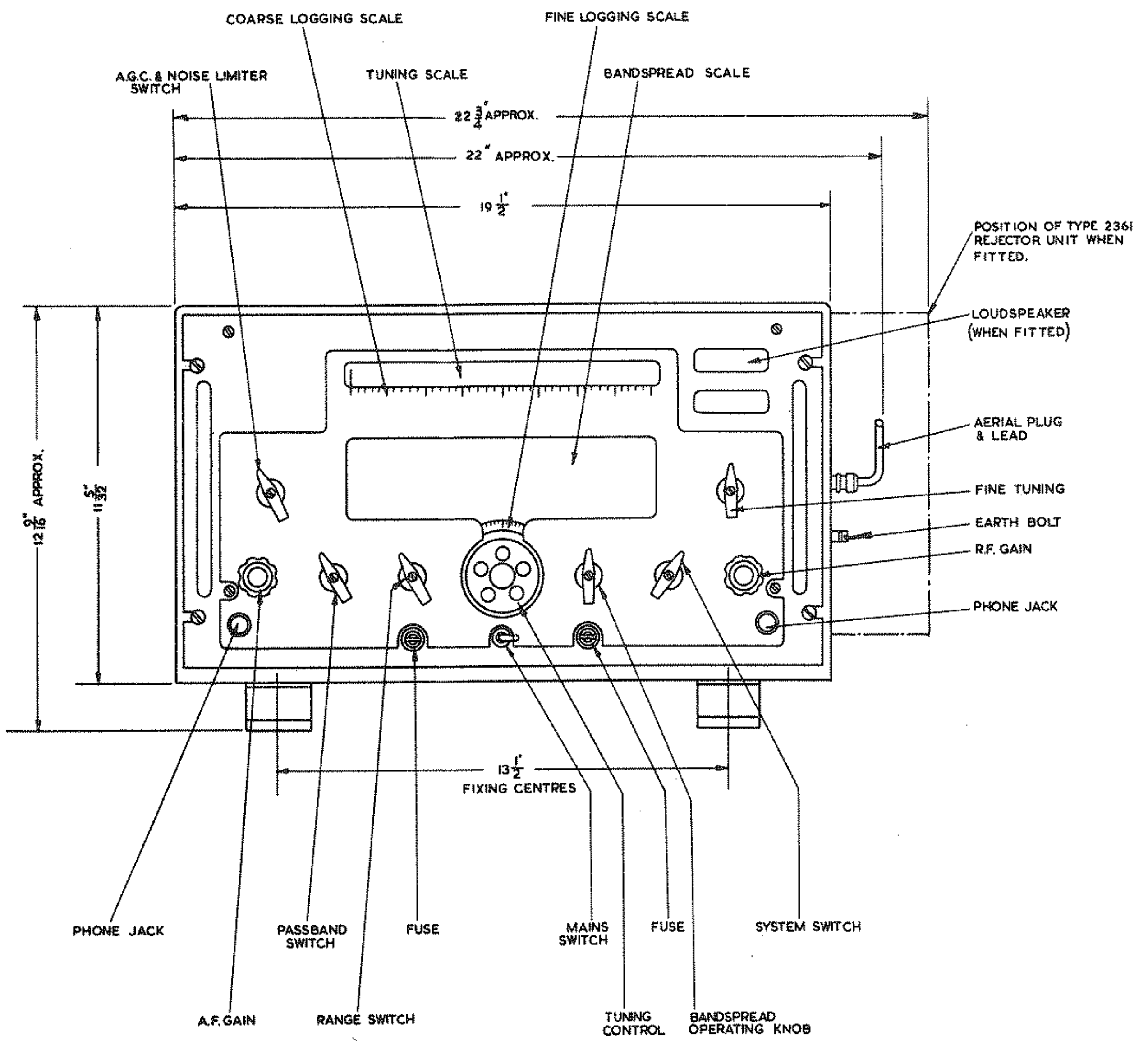
A.G.C. "OFF".

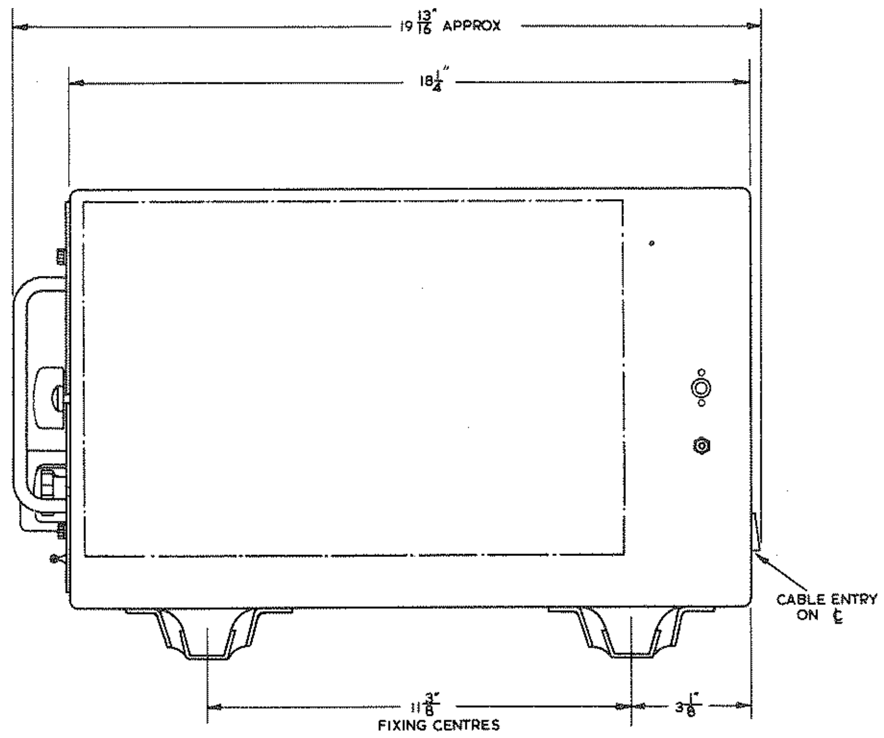
A convenient input level is quoted for each check-point, and the output level is set by means of the I.F. gain control (this is ganged to the R.F. gain control). The step-up values should conform to table 21 (tracking points are given in section 8.4.4.1.).

Table 21

Signal Frequency Step-up

Range	*Tracking Point*	*System*	*Bandwidth*	*Suggested Input*	*Aerial to RF1*	*Step-ups RF1 to RF2*	*RF2 to V3 Grid*
1	Bottom	CW	Narrow	34dB.	4dB. ± 1dB.	7 dB. ± 2dB.	2·5dB. ± 1dB.
	Top	CW	Narrow	30dB.	14dB. ± 3dB.	9·5dB. ± 2dB.	5 dB. ± 1dB.
2	Bottom	CW	Narrow	30dB.	−7dB. ± 3dB.	13·5dB. ± 3dB.	13 dB. ± 3dB.
	Top	CW	Narrow	30dB.	−5dB. ± 1dB.	11 dB. ± 2dB.	10 dB. ± 2dB.
3	Bottom	CW	Narrow	30dB.	10dB. ± 2dB.	−2dB. ± 1·5dB.	15 dB. ± 3dB.
	Top	CW	Narrow	30dB.	19dB. ± 3dB.	−2dB. ± 1·5dB.	20 dB. ± 3dB.
4	Bottom	CW	Narrow	20dB.	10dB. ± 2dB.	−2dB. ± 1·3dB.	20 dB. ± 3dB.
	Top	CW	Narrow	20dB.	18dB. ± 3dB.	−2dB. ± 1·3dB.	28 dB. ± 4dB.
5	Bottom	CW	Narrow	20dB.	11dB. ± 2dB.	−2dB. ± 1·5dB.	26 dB. ± 4dB.
	Top	CW	Narrow	20dB.	19dB. ± 3dB.	−3dB. ± 2dB.	27 dB. ± 4dB.
6	Bottom	MCW	Inter	20dB.	10dB. ± 2dB.	0 ± 2dB.	9 dB. ± 2dB.
	Top	MCW	Inter	20dB.	18dB. ± 3dB.	4 dB. ± 1dB.	12 dB. ± 2dB.
7	Bottom	MCW	Inter	30dB.	15dB. ± 3dB.	7 dB. ± 2dB.	10 dB. ± 2dB.
	Top	MCW	Inter	30dB.	15dB. ± 3dB.	7 dB. ± 2dB.	13 dB. ± 3dB.
8	Bottom	MCW	Inter	30dB.	14dB. ± 3dB.	8 dB. ± 2dB.	13 dB. ± 3dB.
	Top	MCW	Inter	30dB.	15dB. ± 3dB.	7·5dB. ± 2dB.	13 dB. ± 3dB.
9	Bottom	MCW	Inter	30dB.	12dB. ± 2dB.	10 dB. ± 2dB.	9 dB. ± 2dB.
	Top	MCW	Inter	30dB.	14dB. ± 3dB.	13 dB. ± 3dB.	13 dB. ± 3dB.
10	Bottom	MCW	Inter	30dB.	10dB. ± 2dB.	16 dB. ± 3dB.	12 dB. ± 2dB.
	Top	MCW	Inter	30dB.	8dB. ± 2dB.	16 dB. ± 3dB.	16 dB. ± 3dB.





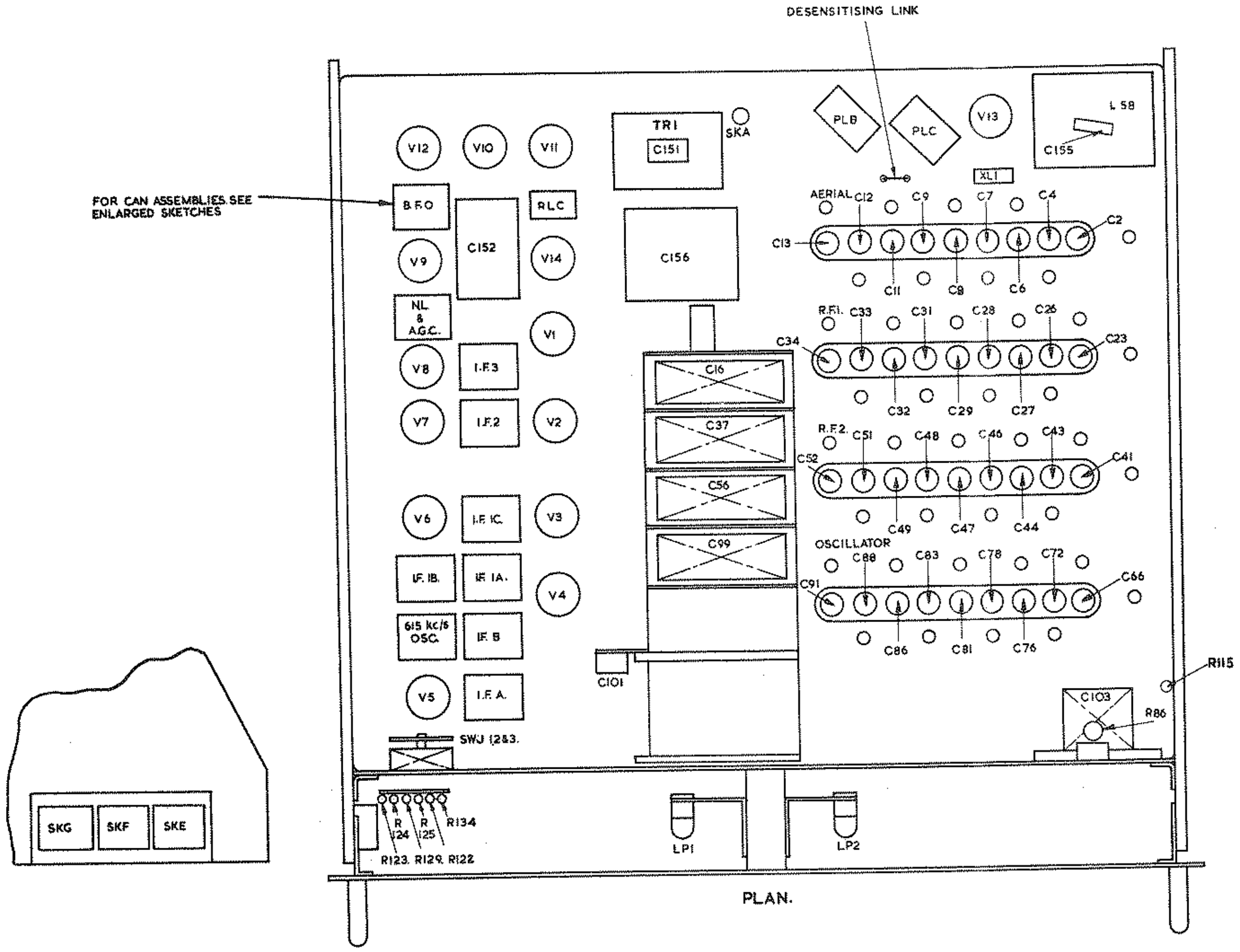
THE FOLLOWING ITEMS ARE SUPPLIED FOR FIXING :-
4 WOODSCREWS, No.12 RD. HD. 1 1/4" LONG.
4 PLAIN WASHERS, 1/4" WHIT.

WEIGHT - 78 LB

Issue No. 2
Sheet No. 1

WZ.13163/D

OUTLINE, CONTROL & FUSE POSITIONS "ATALANTA" RECEIVER TYPE 2207C



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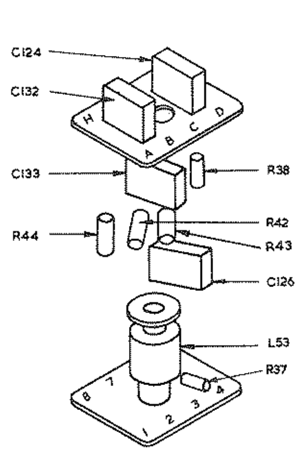
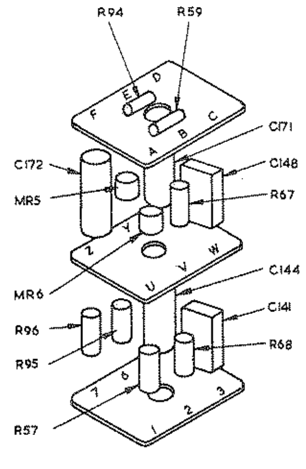
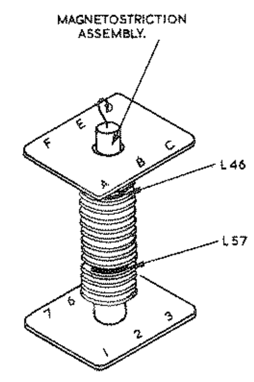


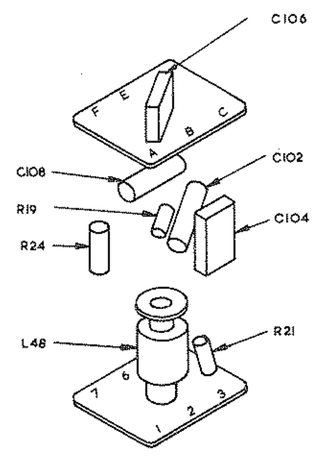
86 Kc/s B.F.O.



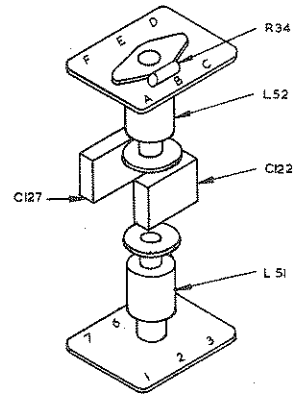
NOISE LIMITER & A.G.C. BIAS ASSEMBLY.



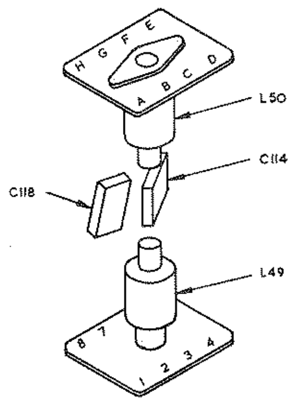
CAN ASSEMBLY 85 Kc/s I.F. 1B.



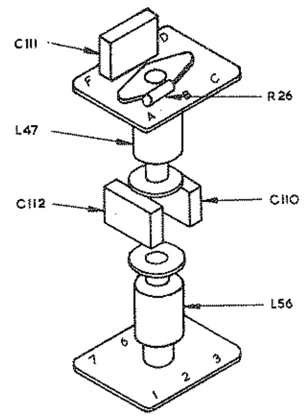
615 Kc/s OSCILLATOR COIL ASSEMBLY.



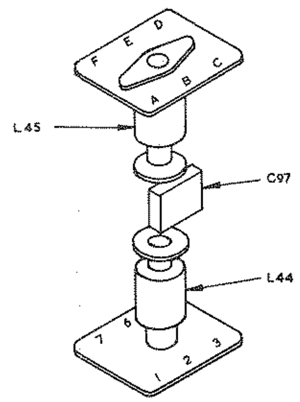
I.F. TRANSFORMER. 85 Kc/s I.F. 3.



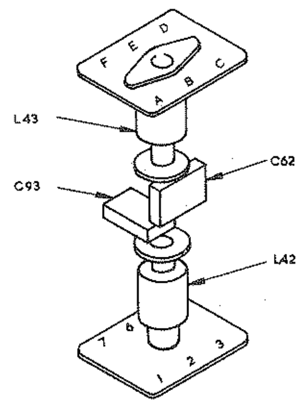
I.F. TRANSFORMER 85 Kc/s I.F.2



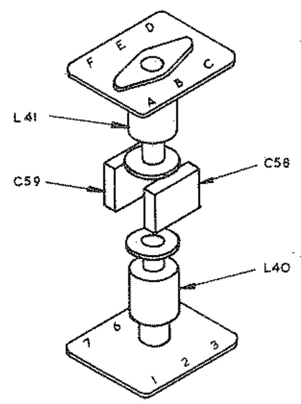
I.F. TRANSFORMER 85Kc/s I.F. I.C.



I.F. TRANSFORMER 85 Kc/s I.F. 1A.



I.F. TRANSFORMER 700 Kc/s I.F. B.

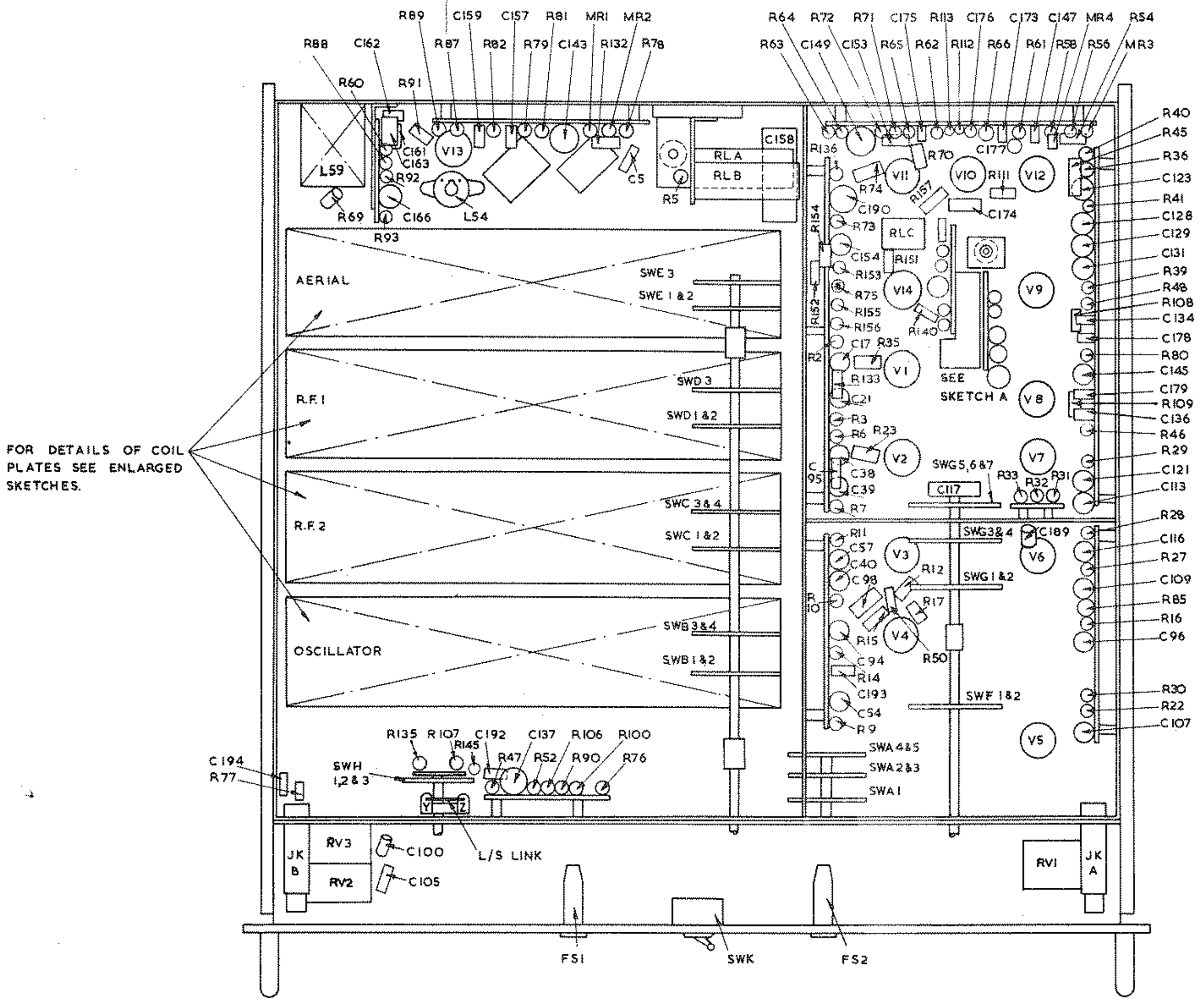


I.F. TRANSFORMER. 700 Kc/s I.F. A.

Issue No. 3
Sheet No. 1

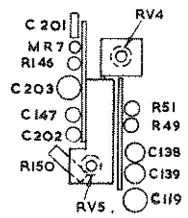
WZ.14127/D

COMPONENT LOCATION "ATALANTA" RECEIVER TYPE 2207C



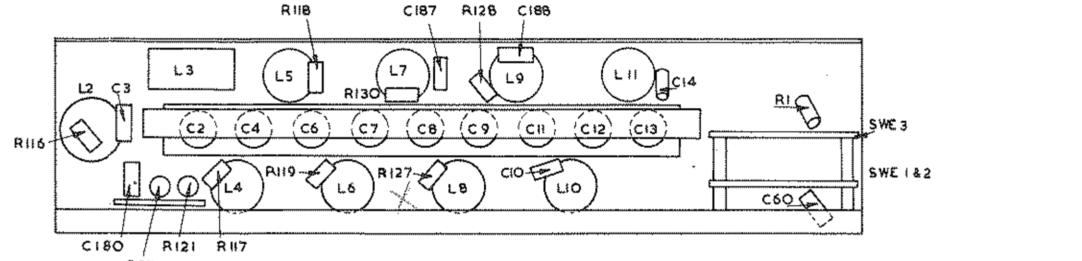
UNDERPLAN

NOTE: RESISTOR MARKED ✳
R75 FOR TYPE 2207A,C,&E, RECEIVER
R149 FOR TYPE 2207 B,D,& F, RECEIVER.

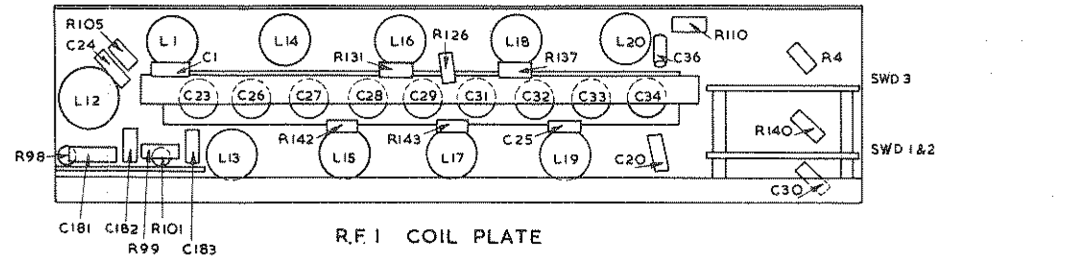


SKETCH A

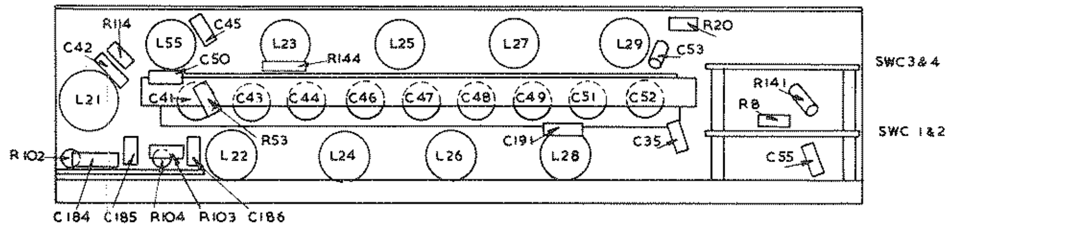
L.H.TAGBOARD ASSY. & RV5 ONLY FITTED ON TYPE 2207 B,D,&F, RECEIVERS (MUTING)



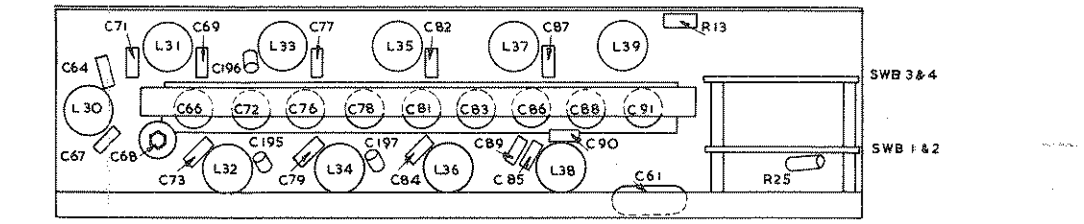
AERIAL COIL PLATE



R.F. 1 COIL PLATE



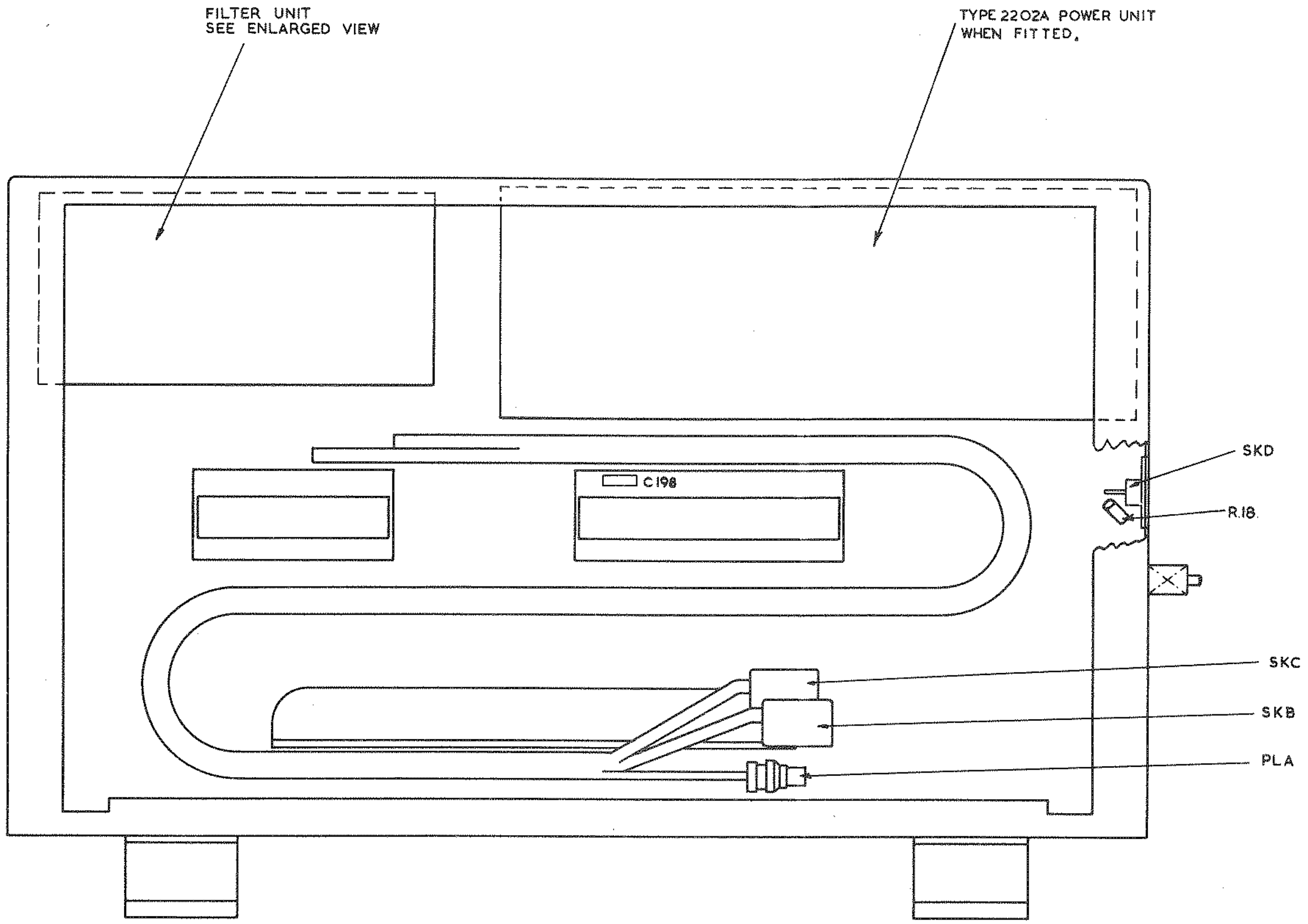
R.F. 2 COIL PLATE



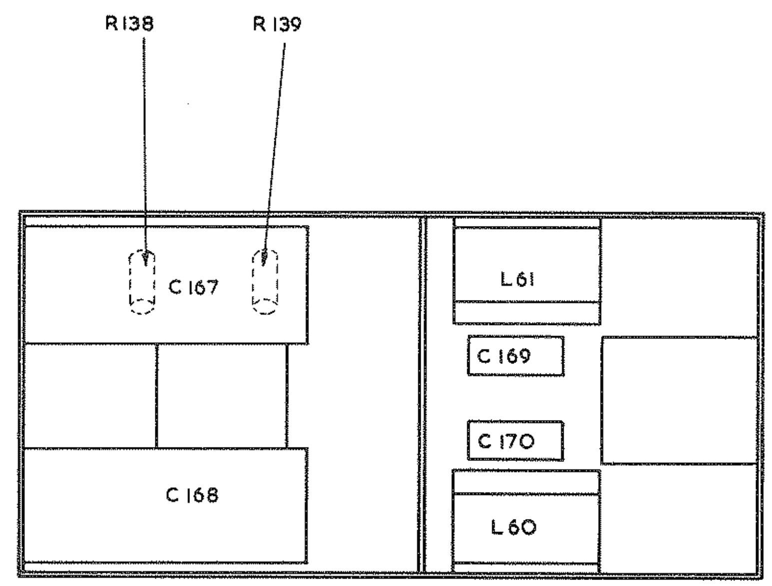
OSCILLATOR COIL PLATE

Issue No. 2
Sheet No. 2
WZ.14127/D

COMPONENT LOCATION "ATALANTA" RECEIVER TYPE 2207C



FRONT ELEVATION OF CASE



ENLARGED VIEW OF FILTER UNIT
(LID REMOVED)

Issue No. 3
Sheet No. 3

WZ.14127/D

COMPONENT LOCATION "ATALANTA" RECEIVER TYPE 2207C

"ATALANTA" RECEIVER TYPES 2207C AND D

Reference numbers in Col. 1 correspond to those on circuit diagrams W.50259 Sheets 1 and 2, WZ.14297/B Sheet 3 and component location WZ.14127/D Sheets 1—3.

When ordering replacements quote description, value and standard identity.

CCT. Ref.	Description	Value	Standard Identity	Remarks
	CAPACITORS			
C1	Mica, Metallised, Moulded Case	1200pF.±5% 350V. D.C.	PC.18801/5	
C2	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C3	Mica, Metallised, Moulded Case	33pF.±5% 750V. D.C.	PC.18802/7	
C4	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C5	Mica, Foil, Moulded Case	4700pF.±20% 350V. D.C.	PC.18701/3	
C6	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C7	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C8	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C9	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C10	Mica, Metallised, Moulded Case	22pF.±5% 750V. D.C.	PC.18802/5	
C11	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C12	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C13	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C14	Ceramic, Tubular, High—K	10,000pF.+80% −20% 350V. D.C.	WIS.7505/B Sh. 1, Ref. 2	
C15				
C16	Variable, Air Dielectric	210pF.	WIS.6198/B Sh. 1, Ref. 2	Ganged with C37, C56, C99.
C17	Paper, Tubular, Metal Case	0·1μF.±20% 200V. D.C.	PC.19201/8	
C18				
C19				
C20	Mica, Foil, Moulded Case	1000pF±20% 350V. D.C.	PC.18701/2	
C21	Paper, Tubular, Metal Case	0·1μF±20% 200V. D.C.	PC.19201/8	
C22				

CCT. Ref.	Description	Value	Standard Identity	Remarks
C23	Trimmer, Air Dielectric	3 to 30pF 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C24	Mica, Metallised, Moulded Case	47pF.±5% 750V. D.C.	PC.18802/9	
C25	Mica, Metallised, Moulded Case	10pF.±10% 750V. D.C.	PC.18802/1	
C26	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C27	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C28	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C29	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C30	Mica, Metallised, Moulded Case	39pF.±5% 750V. D.C.	PC.18802/8	
C31	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C32	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C33	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C34	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C35	Mica, Foil, Moulded Case	1000pF.±20% 350V. D.C.	PC.18701/2	
C36	Ceramic, Tubular, High—K	10,000pF.+80% −20% 350V. D.C.	WIS.7505/B Sh. 1, Ref. 2	
C37	Variable, Air Dielectric	210pF.	WIS.6198/B Sh. 1, Ref. 2	Ganged with C16, C56, C99
C38	Paper, Tub. Met. Case, Insul.	0·1μF.±20% 200V. D.C.	PC.19201/8	
C39	Paper, Tub. Met. Case, Insul.	0·1μF.±20% 200V. D.C.	PC.19201/8	
C40	Paper, Tub. Met. Case, Insul.	0·1μF.±20% 200V. D.C.	PC.19201/8	
C41	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C42	Mica, Metallised, Moulded Case	39pF.±5% 750V. D.C.	PC.18802/8	
C43	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C44	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C45	Mica, Metallised, Moulded Case	270pF.±5% 750V. D.C.	PC.18802/18	
C46	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C47	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	

CCT. Ref.	Description	Value	Standard Identity	Remarks
C48	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C49	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C50	Miac, Metallised, Moulded Case	100pF.±5% 750V. D.C.	PC.18802/13	
C51	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C52	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C53	Ceramic, Tubular, High—K	10,000pF.+80% −20% 350V. D.C.	WIS.7505/B Sh. 1, Ref. 2	
C54	Paper, Tub. Met. Case Insul.	0·1μF.±20% 200V. D.C.	PC.19201/8	
C55	Mica, Metallised, Moulded Case	47pF.±5% 750V. D.C.	PC.18802/9	
C56	Variable, Air Dielectric	210pF.	WIS.6198/B Sh. 1, Ref. 2	Ganged with C16, C37, C99
C57	Paper, Tub. Met. Case, Insul.	0·1μF.±20% 200V. D.C.	PC.19201/8	
C58	Mica, Metallised, Moulded Case	1000pF.±5% 350V. D.C.	PC.18801/4	
C59	Mica, Metallised, Moulded Case	330pF.±5% 750V. D.C.	PC.18802/19	
C60	Mica, Metallised, Moulded Case	56pF.±5% 750V. D.C.	PC.18802/10	
C61	Mica, Metallised, Moulded Case	10,000pF.±5% 350V. D.C.	PC.18801/10	
C62	Mica, Metallised, Moulded Case	330pF.±5% 750V. D.C.	PC.18802/19	
C63				
C64	Mica, Metallised, Moulded Case	100pF.±2% 750V. D.C.	*WIS.4483/B Sh. 1, Ref. 11	NSA/M 255
C65				
C66	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C67	Mica, Metallised, Moulded Case	120pF.±5% 750V. D.C.	PC.18802/14	
C68	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	W.22662/C Sh. 1, Edn. A	
C69	Mica, Metallised, Moulded Case	150pF.±2% 750V. D.C.	*WIS.4483/B Sh. 1, Ref. 11	NSA/M255
C70				
C71	Mica, Metallised, Moulded Case	150pF.±5% 750V. D.C.	PC.18802/15	
C72	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C73	Mica, Metallised, Moulded Case	330pF.±2% 750V. D.C.	*WIS.4483/B Sh. 1, Ref. 11	NSA/M255
C74				
C75				

CCT. Ref.	Description	Value	Standard Identity	Remarks
C76	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C77	Mica, Metallised, Moulded Case	620pF.±2% 350V. D.C.	*WIS.4483/B Sh. 1, Ref. 9	NSA/M335
C78	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C79	Mica, Metallised, Moulded Case	1200pF.±2% 350V. D.C.	*WIS.4483/B Sh. 1, Ref. 9	NSA/M335
C80				
C81	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C82	Mica, Metallised, Moulded Case	300pF.±2% 750V. D.C.	*WIS.4483/B Sh. 1, Ref. 11	NSA/M335
C83	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C84	Mica, Metallised, Moulded Case	620pF.±2% 350V. D.C.	*WIS.4483/B Sh. 1, Ref. 9	NSA/M255
C85	Mica, Metallised, Moulded Case	1500pF.±2% 350V. D.C.	*WIS.4483/B Sh. 1, Ref. 9	NSA/N255
C86	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C87	Mica, Metallised, Moulded Case	1300pF.±2% 350V. D.C.	*WIS.4483/B Sh. 1, Ref. 9	NSA/M255
C88	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C89	Mica, Metallised, Moulded Case	1500pF.±2% 350V. D.C.	*WIS.4483/B Sh. 1, Ref. 9	NSA/M255
C90	Mica, Metlalised, Moulded Case	10pF.±10% 750V. D.C.	PC.18802/1	
C91	Trimmer, Air Dielectric	3 to 30pF. 75V. D.C.	WIS.2848 Sh. 1, Ref. 1	
C92				
C93	Mica, Metallised, Moulded Case	330pF.±5% 750V. D.C.	PC.18802/19	
C94	Paper, Tub. Met. Case, Insul.	0.1μF.±20% 200V. D.C.	PC.19201/8	
C95	Mica, Foil, Moulded Case	1000pF.±20% 350V. D.C.	PC.18701/2	
C96	Paper, Tub. Met. Case, Insul.	0·1μF.±20% 200V. D.C.	PC.19201/8	
C97	Mica, Metallised, Moulded Case	1000pF.±5% 350V. D.C.	PC.18801/4	
C98	Mica, Metallised, Moulded Case	27pF.±5% 75V. D.C.	PC.18802/6	
C99	Variable, Air Dielectric	210pF.	WIS.6198/B Sh. 1, Ref. 2	Ganged with C16, C37, C56.
C100	Paper, Tub. Met. Case, Insul.	0·1μF.±25% 150V. D.C.	PC.19301/1	
C101	Temperature Compensator		W.47190/B Sh. 1, Edn. A	
C102	Paper, Tub. Met. Case, Insul.	·01μF.±25% 200V. D.C.	PC.19201/3	

CCT. Ref.	Description	Value	Standard Identity	Remarks
C103	Variable, Air Dielectric	5-25pF.	W.58067/C Sh. 1, Ref. 1	
C104	Mica, Metallised, Moulded Case	100pF.±5% 750V. D.C.	PC.18802/13	
C105	Paper, Tub. Met. Case, Insul.	0·1μF.±25% 150V. D.C.	PC.19301/1	
C106	Mica, Metallised, Moulded Case	1000pF.±5% 350V. D.C.	PC.18801/4	
C107	Paper, Tub. Met. Case, Insul.	0·1μF.±20% 200V. D.C.	PC.19201/8	
C108	Paper, Tub. Met. Case, Insul.	·01μF.±25% 200V. D.C.	PC.19201/3	
C109	Paper, Tub. Met. Case, Insul.	0·1μF.±20% 200V. D.C.	PC.19201/8	
C110	Mica, Metallised, Moulded Case	1000pF.±5% 350V. D.C.	PC.18801/4	
C111	Mica, Metallised, Moulded Case	1000pF.±5% 350V. D.C.	PC.18801/4	
C112	Mica, Foil, Moulded Case	1000pF.±20% 350V. D.C.	PC.18701/2	
C113	Paper, Tub. Met. Case, Insul.	0·1μF.±20% 200V. D.C.	PC.19201/8	
C114	Mica, Metallised, Moulded	1000pF.±5% 350V. D.C.	PC.18801/4	
C115				
C116	Paper, Tub. Met. Case, Insul.	0·1μF.±20% 200V. D.C.	PC.19201/8	
C117	Paper, Tub. Met. Case, Insul.	·02μF.±20% 350V. D.C.	PC.19202/11	
C118	Mica, Metallised, Moulded Case	1000pF.±5% 350V. D.C.	PC.18801/4	
C119	Paper, Tub. Met. Case, Insul.	0·1μF.±20% 200V. D.C.	PC.19201/8	
C120				
C121	Paper, Tub. Met. Case, Insul.	0·1μF. ±20% 200V. D.C.	PC.19201/8	
C122	Mica, Metallised, Moulded Case	1000pF.±5% 350V. D.C.	PC.18801/4	
C123	Paper, Tub. Met. Case, Insul.	0·1μF.±20% 200V. D.C.	PC.19201/8	
C124	Mica, Foil, Moulded Case	220pF.±20% 750V. D.C.	PC.18702/2	
C125				
C126	Mica, Foil, Moulded Case	1000pF.±20% 350V. D.C.	PC.18701/2	
C127	Mica, Metallised, Moulded Case	1000pF.±5% 350V. D.C.	PC.18801/4	
C128	Paper, Tub. Met. Case, Insul.	0·1μF.±20% 200V. D.C.	PC.19201/8	
C129	Paper, Tub. Met. Case, Insul.	0·1μF.±20% 200V. D.C.	PC.19201/8	
C130				

CCT. Ref.	Description	Value	Standard Identity	Remarks
C159	Mica, Foil, Moulded Case	470pF. ±20% 750V. D.C.	PC.18702/4	
C160				
C161	Mica, Metallised, Moulded Case	68pF. ±5% 750V. D.C.	PC.18802/11	
C162	Mica, Metallised, Moulded Case	150pF. ±5% 750V. D.C.	PC.18802/15	
C163	Mica, Metallised, Moulded Case	150pF. ±5% 750V. D.C.	PC.18802/15	
C164				
C165				
C166	Paper, Tub. Met. Case Insul.,	·1μF. ±20% 200V. D.C.	PC.19201/8	
C167	Paper, Tub. Met. Case, Insul.	2μF. ±20% 250V. A.C. 50 c.p.s.		Dubilier type 417
C168	Paper, Tub. Met. Case, Insul.	2μF. ±20% 250V. A.C. 50 c.p.s.		Dubilier type 417
C169	Mica, Foil, Moulded Case	3300pF. ±20% 750V. D.C.	PC.18702/9	
C170	Mica, Foil, Moulded Case	3300pF. ±20% 750V. D.C.	PC.18702/9	
C171	Paper, Tube, Met. Case Insul.,	·1μF. ±25% 150V. D.C.	PC.19301/1	
C172	Paper, Tube, Met. Case, Insul.	·1μF. ±25% 150V. D.C.	PC.19301/1	
C173	Mica, Foil, Moulded Case	1000pF. ±20% 350V. D.C.	PC.18701/2	
C174	Mica, Metallised, Moulded Case	33pF. ±5% 750V. D.C.	PC.18802/7	
C175	Mica, Foil, Moulded Case	1000pF. ±20% 350V. D.C.	PC.18701/2	
C176	Paper, Tub. Met. Case, Insul.	·002 ±20% 350V. D.C.	PC.19203/3	
C177	Electrolytic, Tub., Insul.	20μF. +50% −20% 12V. D.C.	PC.18404/6	Serial No. 1203 and on.
C178	Mica, Foil, Moulded Case	100pF. ±20% 750V. D.C.	PC.18702/1	
C179	Mica, Foil, Moulded Case	100pF. ±20% 750V. D.C.	PC.18702/1	
C180	Mica, Foil, Moulded Case	470pF. ±20% 750V. D.C.	PC.18702/4	
C181	Mica, Foil, Moulded Case	470pF. ±20% 750V. D.C.	PC.18702/4	
C182	Mica, Foil, Moulded Case	330pF. ±20% 750V. D.C.	PC.18702/3	
C183	Mica, Foil, Moulded Case	330pF. ±20% 750V. D.C.	PC.18702/3	Not reqd. on type 2207 A & B
C184	Mica, Foil, Moulded Case	470pF. ±20% 750V. D.C.	PC.18702/4	
C185	Mica, Foil, Moulded Case	330pF. ±20% 750V. D.C.	PC.18702/3	

CCT. Ref.	Description	Value	Standard Identity	Remarks
C159	Mica, Foil, Moulded Case	470pF.±20% 750V. D.C.	PC.18702/4	
C160				
C161	Mica, Metallised, Moulded Case	68pF.±5% 750V. D.C.	PC.18802/11	
C162	Mica, Metallised, Moulded Case	150pF.±5% 750V. D.C.	PC.18802/15	
C163	Mica, Metallised, Moulded Case	150pF.±5% 750V. D.C.	PC.18802/15	
C164				
C165				
C166	Paper, Tub. Met. Case Insul.,	·1μF.±20% 200V. D.C.	PC.19201/8	
C167	Paper, Tub. Met. Case, Insul.	2μF.±20% 250V. A.C. 50 c.p.s.		Dubilier type 417
C168	Paper, Tub. Met. Case, Insul.	2μF.±20% 250V. A.C. 50 c.p.s.		Dubilier type 417
C169	Mica, Foil, Moulded Case	3300pF.±20% 750V. D.C.	PC.18702/9	
C170	Mica, Foil, Moulded Case	3300pF.±20% 750V. D.C.	PC.18702/9	
C171	Paper, Tube, Met. Case Insul.,	·1μF.±25% 150V. D.C.	PC.19301/1	
C172	Paper, Tube, Met. Case, Insul.	·1μF.±25% 150V. D.C.	PC.19301/1	
C173	Mica, Foil, Moulded Case	1000pF.±20% 350V. D.C.	PC.18701/2	
C174	Mica, Metallised, Moulded Case	33pF.±5% 750V. D.C.	PC.18802/7	
C175	Mica, Foil, Moulded Case	1000pF.±20% 350V. D.C.	PC.18701/2	
C176	Paper, Tub. Met. Case, Insul.	·002±20% 350V. D.C.	PC.19203/3	
C177	Electrolytic, Tub., Insul.	20μF.+50% −20% 12V. D.C.	PC.18404/6	Serial No. 1203 and on.
C178	Mica, Foil, Moulded Case	100pF.±20% 750V. D.C.	PC.18702/1	
C179	Mica, Foil, Moulded Case	100pF.±20% 750V. D.C.	PC.18702/1	
C180	Mica, Foil, Moulded Case	470pF.±20% 750V. D.C.	PC.18702/4	
C181	Mica, Foil, Moulded Case	470pF.±20% 750V. D.C.	PC.18702/4	
C182	Mica, Foil, Moulded Case	330pF.±20% 750V. D.C.	PC.18702/3	
C183	Mica, Foil, Moulded Case	330pF.±20% 750V. D.C.	PC.18702/3	Not reqd. on type 2207 A & B
C184	Mica, Foil, Moulded Case	470pF.±20% 750V. D.C.	PC.18702/4	
C185	Mica, Foil, Moulded Case	330pF.±20% 750V. D.C.	PC.18702/3	

CCT. Ref.	Description	Value	Standard Identity	Remarks
C186	Mica, Foil, Moulded Case	330pF.±20% 750V. D.C.	PC.18702/3	
C187	Mica, Metallised, Moulded Case	150pF.±5% 750V. D.C.	PC.18802/15	
C188	Mica, Metallised, Moulded Case.	470pF.±5% 750V. D.C.	PC.18802/21	
C189	Paper, Tub. Met. Case, Insul.	0·1μF.±20% 350V. D.C.	PC.19302/2	
C190	Paper, Tub. Met. Case, Insul.	1μF.±25% 150V. D.C.	PC.19301/4	
C191	Mica, Metallised, Moulded Case	10pF.±10% 750V. D.C.	PC.18802/1	
C192	Mica, Foil, Moulded Case	1000pF.±20% 350V. D.C.	PC.18701/2	
C193	Mica, Foil, Moulded Case	1000pF.±20% 350V. D.C.	PC.18701/2	
C194	Mica, Foil, Moulded Case	1000pF.±20% 350V. D.C.	PC.18701/2	
C195	Ceramic, Tubular, Insulated	10pF.±10% 500V. D.C.	PC.18202/1	
C196	Ceramic, Tubular, Insulated	10pF.±10% 500V. D.C.	PC.18202/1	
C197	Ceramic, Tubular, Insulated	10pF.±10% 500V. D.C.	PC.18202/1	
C198	Ceramic, Tubular, Met. Case, Insulated	0·1μF.±25% 150V. D.C.	PC.19301/1	
C199				
C200				
C201	Mica, Metallised, Moulded Case	·001μF.±5% 350V. D.C.	PC.18801/4	For muting (type 2207D)
C202	Paper, Foil, Tub., Insul.	0·01μF.±25% 200V. D.C.	PC.19201/3	For muting (type 2207D)
C203	Paper, Foil, Tub., Insul.	0·02μF.±20% 350V. D.C.	PC.19202/11	For muting (type 2207D)
C204				
C205				
C206				
C207				
	RESISTORS, FIXED			
R1	Comp. Grade 2, Insul.	100k Ω±10% ¾W	PC.66611/49	
R2	Comp. Grade 2, Insul.	330 Ω±10% ¾W.	PC.66611/19	
R3	Comp. Grade 1, "High Stability", Insul.	2·2k Ω±5% ¼W.	PC.66602/24	
R4	Comp. Grade 2, Insul.	100k Ω±10% ¾W.	PC.66611/49	
R5	Comp. Grade 2, Insul.	10k Ω±10% ¾W.	PC.66611/37	

CCT. Ref.	Description	Value	Standard Identity	Remarks
R6	Comp. Grade 2, Insul.	330 Ω±10% ¾W.	PC.66611/19	
R7	Comp. Grade 1, "High Stability", Insul.	2·2k Ω±5% ¼W.	PC.66602/24	
R8	Comp. Grade 2, Insul.	100k Ω±10% ¾W.	PC.66611/49	
R9	Comp. Grade 1, "High Stability", Insul.	2·2k Ω±5% ¼W.	PC.66602/24	
R10	Comp. Grade 2, Insul.	2·2k Ω±10% ¾W.	PC.66611/29	
R11	Comp. Grade 2, Insul.	220 Ω±10% ¾W.	PC.66611/17	
R12	Comp. Grade 2, Insul.	100 Ω±10% ¼W.	PC.66609/7	
R13	Comp. Grade 2, Insul.	2·2k Ω±10% ¾W.	PC.66611/29	
R14	Comp. Grade 1, "High Stability", Insul.	3·3k Ω±5% ¼W.	PC.66602/26	
R15	Comp. Grade 2, Insul.	33k Ω±10% ¼W.	PC.66609/37	
R16	Comp. Grade 1, "High Stability", Insul.	2·2k Ω±5% ¼W.	PC.66602/24	
R17	Comp. Grade 2, Insul.	100k Ω±10% ¼W.	PC.66609/43	
R18	Comp. Grade 2, Insul.	470k Ω±10% ¾W.	PC.66611/57	
R19	Comp. Grade 2, Insul.	470 Ω±10% ½W.	PC.66610/21	
R20	Comp. Grade 2, Insul.	1k Ω±10% ¾W.	PC.66611/25	
R21	Comp. Grade 2, Insul.	47k Ω±10% ¼W.	PC.66609/39	
R22	Comp. Grade 2, Insul.	2·2k Ω±10% ¾W.	PC.66611/29	
R23	Comp. Grade 2, Insul.	33 Ω±10% ¼W.	PC.66610/7	
R24	Comp. Grade 2, Insul.	10k Ω±10% ¾W.	PC.66611/37	
R25	Comp. Grade 2, Insul.	100 Ω±10% ¾W.	PC.66611/13	
R26	Comp. Grade 2, Insul.	1M Ω±10% ¼W.	PC.66609/55	
R27	Comp. Grade 2, Insul.	100k Ω±10% ¾W.	PC. 66611/49	
R28	Comp. Grade 2, Insul.	330 Ω±10% ¾W.	PC.66611/19	
R29	Comp. Grade 1, "High Stability", Insul.	2·2k Ω±5% ¼W.	PC.66602/24	
R30	Comp. Grade 1, "High Stability", Insul.	150 Ω±5% ¼W.	PC.66602/10	
R31	Comp. Grade 2, Insul.	330 Ω±10% ¾W.	PC.66611/19	

CCT. Ref.	Description	Value	Standard Identity	R emarks
R32	Comp. Grade 2, Insul.	470 Ω±10% ¾W.	PC.66611/21	
R33	Comp. Grade 1, "High Stability", Insul.	2·2k Ω±5% ¼W.	PC.66602/24	
R34	Comp. Grade 2, Insul.	150k Ω±10% ¼W.	PC.66609/45	
R35	Comp. Grade 2, Insul.	33 Ω±10% ¼W.	PC.66610/7	
R36	Comp. Grade 2, Insul.	10k Ω±10% ¾W.	PC.66611/37	
R37	Comp. Grade 2, Insul.	10k Ω±10% ¼W.	PC.66609/31	
R38	Comp. Grade 2, Insul.	10k Ω±10% ¼W.	PC.66609/31	
R39	Comp. Grade 2, Insul.	4·7k Ω±10% ¾W.	PC.66611/33	
R40	Comp. Grade 1, "High Stability", Insul.	33 Ω±5% ¼W.	PC.66602/2	
R41	Comp. Grade 2, Insul.	150k Ω±10% ¾W.	PC.66611/51	
R42	Comp. Grade 2, Insul.	100k Ω±10% ½W.	PC.66610/49	
R43	Comp. Grade 2, Insul.	47k Ω±10% ½W.	PC.66610/45	
R44	Comp. Grade 2, Insul.	470 Ω±10% ½W.	PC.66610/21	
R45	Comp. Grade 1, "High Stability", Insul.	1k Ω±5% ¼W.	PC.66602/20	
R46	Comp. Grade 1, "High Stability", Insul.	100k Ω±5% ¼W.	PC.66602/44	
R47	Comp. Grade 2, Insul.	470k Ω±10% ¾W.	PC.66611/57	
R48	Comp. Grade 1, "High Stability", Insul.	100k Ω±5% ¼W.	PC.66602/44	
R49	Comp. Grade 1, "High Stability", Insul.	470k Ω±5% ⅛W.	PC.66601/45	
R50	Comp. Grade 2, Insul.	100 Ω±10% ¼W.	PC.66609/7	
R51	Comp. Grade 1, "High Stability", Insul.	470k Ω±5% ⅛W.	PC.66601/45	
R52	Comp. Grade 2, Insul.	470k Ω±10% ¾W.	PC.66611/57	
R53	Comp. Grade 2, Insul.	3·3k Ω±10% ¼W.	PC.66609/25	
R54	Comp. Grade 2, Insul.	1M Ω±10% ½W.	PC.66610/61	
R55				
R56	Comp. Grade 2, Insul.	2·2M Ω±10% ½W.	PC.66610/65	
R57	Comp. Grade 2, Insul.	1M Ω±10% ½W.	PC.66610/61	

CCT. Ref.	Description	Value	Standard Identity	Remarks
R58	Comp. Grade 2, Insul.	1M $\Omega \pm 10\%$ $\frac{1}{2}$W.	PC.66610/61	
R59	Comp. Grade 2, Insul.	1M $\Omega \pm 10\%$ $\frac{1}{4}$W.	PC.66609/55	
R60	Comp. Grade 2, Insul.	22k $\Omega \pm 10\%$ $\frac{3}{4}$W.	PC.66611/41	
R61	Comp. Grade 2, Insul.	3·3k $\Omega \pm 10\%$ $\frac{1}{2}$W.	PC.66610/31	
R62	Comp. Grade 2, Insul.	3·3k $\Omega \pm 10\%$ $\frac{1}{2}$W.	PC.66610/31	
R63	Comp. Grade 1, "High Stability", Insul.	2·2k $\Omega \pm 5\%$ $\frac{1}{4}$W.	PC.66602/24	
R64	Comp. Grade 2, Insul.	22k $\Omega \pm 10\%$ $\frac{3}{4}$W.	PC.66611/41	
R65	Comp. Grade 2, Insul.	47k $\Omega \pm 10\%$ $\frac{1}{2}$W.	PC.66610/45	
R66	Comp. Grade 2, Insul.	47k $\Omega \pm 10\%$ $\frac{1}{2}$W.	PC.66610/45	
R67	Comp. Grade 2, Insul.	2·2M $\Omega \pm 10\%$ $\frac{1}{2}$W.	PC.66610/65	
R68	Comp. Grade 2, Insul.	82k $\Omega \pm 10\%$ $\frac{1}{2}$W.	PC.66610/48	
R69	Comp. Grade 1, "High Stability", Insul.	100k $\Omega \pm 5\%$ $\frac{1}{4}$W.	PC.66602/8	
R70	Comp. Grade 2, Insul.	47k $\Omega \pm 10\%$ $\frac{1}{4}$W.	PC.66609/39	
R71	Comp. Grade 2, Insul.	1M $\Omega \pm 10\%$ $\frac{1}{2}$W.	PC.66610/61	
R72	Comp. Grade 2, Insul.	270k $\Omega \pm 10\%$ $\frac{1}{2}$W.	PC.66610/54	
R73	Comp. Grade 2, Insul.	100 $\Omega \pm 10\%$ $\frac{3}{4}$W.	PC.66611/13	
R74	Comp. Grade 2, Insul.	100 $\Omega \pm 10\%$ $\frac{1}{4}$W.	PC.66609/7	
R75	Wire Wound Vit. Enam. Wire Term.	22 $\Omega \pm 5\%$ 3W.	PC.67008/3	Not reqd. on type 2207D
R76	Wire Wound Vit. Enam. Wire Term.	1k $\Omega \pm 5\%$ 6W.	PC.67010/13	
R77	Wire Wound Vit. Enam. Wire Term.	4·7 $\Omega \pm 10\%$ $1\frac{1}{2}$W.	PC.67007/23	
R78	Comp. Grade 2, Insul.	820k $\Omega \pm 10\%$ $\frac{3}{4}$W.	PC.66611/60	
R79	Comp. Grade 2, Insul.	47k $\Omega \pm 10\%$ $\frac{3}{4}$W.	PC.66611/45	
R80	Comp. Grade 2, Insul.	10k $\Omega \pm 10\%$ $\frac{3}{4}$W.	PC.66611/37	
R81	Comp. Grade 2, Insul.	10k $\Omega \pm 10\%$ $\frac{3}{4}$W.	PC.66611/37	
R82	Comp. Grade 2, Insul.	22k $\Omega \pm 10\%$ $\frac{3}{4}$W.	PC.66611/41	
R83				
R84				

CCT. Ref.	Description	Value	Standard Identity	Remarks
R85	Wire Wound Vit. Enam. Term.	60 Ω±5% 10W.	WIS.7416/B Sh. 1, Ref. 5	
R86	Wire Wound Vit. Enam. Term.	330 Ω±5% 10W.	PC.67011/10	
R87	Thermistor	5·5k Ω at 20°C.	WIS.6231/C Sh. 1, Ref. 2	Type CZ.2
R88	Comp. Grade 2, Insul.	150k Ω±10% ¾W.	PC.66611/51	
R89	Thermistor	5·5k Ω at 20°C.	WIS.6231/C Sh. 1, Ref. 2	Type CZ.2
R90	Comp. Grade 1, "High Stability" Insul.	3·3k Ω±5% ¼W.	PC.66602/26	
R91	Comp. Grade 2, Insul.	47 Ω±10% ¼W.	PC.66610/9	
R92	Comp. Grade 1, "High Stability", Insul.	1k Ω±5% ¼W.	PC.66602/20	
R93	Comp. Grade 2, Insul.	10k Ω±10% ¾W.	PC.66611/37	
R94	Comp. Grade 2, Insul.	2·2k Ω±10% ¼W.	PC.66609/23	
R95	Comp. Grade 2, Insul.	10k Ω±10% ½W.	PC.66610/37	
R96	Comp. Grade 2, Insul.	150k Ω±10% ½W.	PC.66610/51	
R97	Comp. Grade 2, Insul.	4·7k Ω±10% ¾W.	PC.66611/33	
R98	Comp. Grade 2, Insul.	33k Ω±10% ¾W.	PC.66611/43	
R99	Comp. Grade 2, Insul.	4·7k Ω±10% ¾W.	PC.66611/33	
R100	Comp. Grade 1, "High Stability", Insul.	22k Ω±5% ¼W.	PC.66602/36	
R101	Comp. Grade 2, Insul.	4·7k Ω±10% ¾W.	PC.66611/33	
R102	Comp. Grade 2, Insul.	33k Ω±10% ¾W.	PC.66611/43	
R103	Comp. Grade 2, Insul.	4·7k Ω±10% ¾W.	PC.66611/33	
R104	Comp. Grade 2, Insul.	4·7k Ω±10% ¾W.	PC.66611/33	
R105	Comp. Grade 2, Insul.	470k Ω±10% ½W.	PC.66610/57	
R106	Comp. Grade 2, Insul.	10k Ω±10% ¾W.	PC.66611/37	
R107	Comp. Grade 2, Insul.	15k Ω±10% ¾W.	PC.66611/39	
R108	Comp. Grade 2, Insul.	68k Ω±10% ½W.	PC.66610/47	
R109	Comp. Grade 2, Insul.	68k Ω±10% ½W.	PC.66610/47	
R110	Comp. Grade 2, Insul.	1k Ω±10% ¾W.	PC.66611/25	

CCT. Ref.	Description	Value	Standard Identity	Remarks
R111	Comp. Grade 2, Insul.	100k $\Omega \pm 10\%$ $\frac{1}{4}$W.	PC.66609/43	
R112	Comp. Grade 2, Insul.	220k $\Omega \pm 10\%$ $\frac{1}{4}$W.	PC.66609/47	
R113	Comp. Grade 2, Insul.	220k $\Omega \pm 10\%$ $\frac{1}{4}$W.	PC.66609/47	Up to serial No. 1202
		68k $\Omega \pm 10\%$ $\frac{1}{4}$W.	PC.66609/41	Serial No. 1203 and on
R114	Comp. Grade 2, Insul.	470k $\Omega \pm 10\%$ $\frac{1}{2}$W.	PC.66610/57	
R115	Thermistor	350 Ω at 20°C.	WIS.6231/C Sh. 1, Ref. 7	Type CZ.9A
R116	Comp. Grade 2, Insul.	4·7k $\Omega \pm 10\%$ $\frac{1}{2}$W.	PC.66610/33	
R117	Comp. Grade 2, Insul.	680 $\Omega \pm 10\%$ $\frac{1}{2}$W.	PC.66610/23	
R118	Comp. Grade 2, Insul.	330 $\Omega \pm 10\%$ $\frac{1}{2}$W.	PC.66610/19	
R119	Comp. Grade 2, Insul.	150 $\Omega \pm 10\%$ $\frac{1}{2}$W.	PC.66610/15	
R120				
R121	Comp. Grade 2, Insul.	47k $\Omega \pm 10\%$ $\frac{3}{4}$W.	PC.66611/45	
R122	Comp. Grade 1, "High Stability", Insul.	6·8k $\Omega \pm 5\%$ $\frac{1}{4}$W.	PC.66602/30	
R123	Comp. Grade 1, "High Stability", Insul.	330k $\Omega \pm 5\%$ $\frac{1}{4}$W.	PC.66602/50	
R124	Comp. Grade 1, "High Stability", Insul.	10k $\Omega \pm 5\%$ $\frac{1}{4}$W.	PC.66602/32	
R125	Comp. Grade 1, "High Stability", Insul.	22k $\Omega \pm 5\%$ $\frac{1}{4}$W.	PC.66602/36	
R126	Comp. Grade 2, Insul.	680 $\Omega \pm 10\%$ $\frac{1}{4}$W.	PC.66609/17	
R127	Comp. Grade 2, Insul.	220 $\Omega \pm 10\%$ $\frac{1}{2}$W.	PC.66610/17	
R128	Comp. Grade 2, Insul.	27 $\Omega \pm 10\%$ $\frac{1}{2}$W.	PC.66610/6	
R129	Comp. Grade 1, "High Stability", Insul.	6·8k $\Omega \pm 5\%$ $\frac{1}{4}$W.	PC.66602/30	
R130	Comp. Grade 2, Insul.	220k $\Omega \pm 10\%$ $\frac{1}{2}$W.	PC.66610/53	
R131	Comp. Grade 2, Insul.	220k $\Omega \pm 10\%$ $\frac{1}{2}$W.	PC.66610/53	
R132	Comp. Grade 2, Insul.	680k $\Omega \pm 10\%$ $\frac{1}{2}$W.	PC.66610/59	
R133	Comp. Grade 2, Insul.	470k $\Omega \pm 10\%$ $\frac{1}{2}$W.	PC.66610/57	
R134	Comp. Grade 1, "High Stability", Insul.	22k $\Omega \pm 5\%$ $\frac{1}{4}$W.	PC.66602/36	
R135	Comp. Grade 2, Insul.	33k $\Omega \pm 10\%$ $\frac{3}{4}$W.	PC.66611/43	

CCT. Ref.	Description	Value	Standard Identity	Remarks
R136	Comp. Grade 2, Insul.	3·3k Ω±10% ¾W.	PC.66611/31	
R137	Comp. Grade 2, Insul.	15k Ω±10% ½W.	PC.66610/39	
R138	Comp. Grade 2, Insul.	470k Ω±10% ½W.	PC.66610/57	
R139	Comp. Grade 2, Insul.	470k Ω±10% ½W.	PC.66610/57	
R140	Comp. Grade 2, Insul.	150 Ω±10% ¾W.	PC.66611/15	
R141	Comp. Grade 2, Insul.	150 Ω±10% ¾W.	PC.66611/15	
R142	Comp. Grade 2, Insul.	470k Ω±10% ½W.	PC.66610/57	
R143	Comp. Grade 2, Insul.	68k Ω±10% ½W.	PC.66610/47	
R144	Comp. Grade 2, Insul.	680k Ω±10% ¼W.	PC.66609/53	Type 2207D (Muting)
R145	Comp. Grade 2, Insul.	150k Ω±10% ¼W.	PC.66610/51	Type 2207D (Muting)
R146	Comp. Grade 2, Insul.	150k Ω±10% ¼W.	PC.66610/51	Type 2207D (Muting)
R147	Comp. Grade 2, Insul.	2·7M Ω±10% ¼W.	PC.66610/66	Type 2207D (Muting)
R148	Comp. Grade 2, Insul.	1M Ω±10% ¼W.	PC.66609/55	Type 2207D (Muting)
R149	Comp. Grade 2, Insul.	220k Ω±10% ½W.	PC.66611/53	Type 2207D (Muting)
R150	Comp. Grade 2, Insul.	33k Ω±10% ¼W.	PC.66610/43	Type 2207D (Muting)
R151	Comp. Grade 2, Insul.	5·6k Ω±10% ¼W.	PC.66610/34	Type 2207D (Muting)
R152	Comp. Grade 1, Insul.	33 Ω±5% ⅛W.	PC.66601/52	Type 2207D (Muting)
R153	Comp. Grade 1, Insul.	12k Ω±5% ½W.	PC.66605/38	Type 2207D (Muting)
R154	Comp. Grade 1, Insul.	33 Ω±5% ⅛W.	PC.66601/52	Type 2207D (Muting)
R155	Comp. Grade 1, Insul.	56k Ω±5% ¼W.	PC.66602/41	Type 2207D (Muting)
R156	Comp. Grade 1, Insul.	47k Ω±5% ¼W.	PC.66602/40	Type 2207D (Muting)
R157	Comp. Grade 2, Insul.	10k Ω±10% ¼W.	PC.66609/31	Type 2207D (Muting) up to Serial No. 1202
R157	Comp. Grade 2, Insul.	5·6k Ω±10% ¼W.	PC.66609/28	Type 2207D (Muting) Serial No. 1203 and on
	RESISTORS VARIABLE			
RV1	Potentiometer, Log	2M Ω±20%	WIS.3032 Sh. 12, Ref. 260	

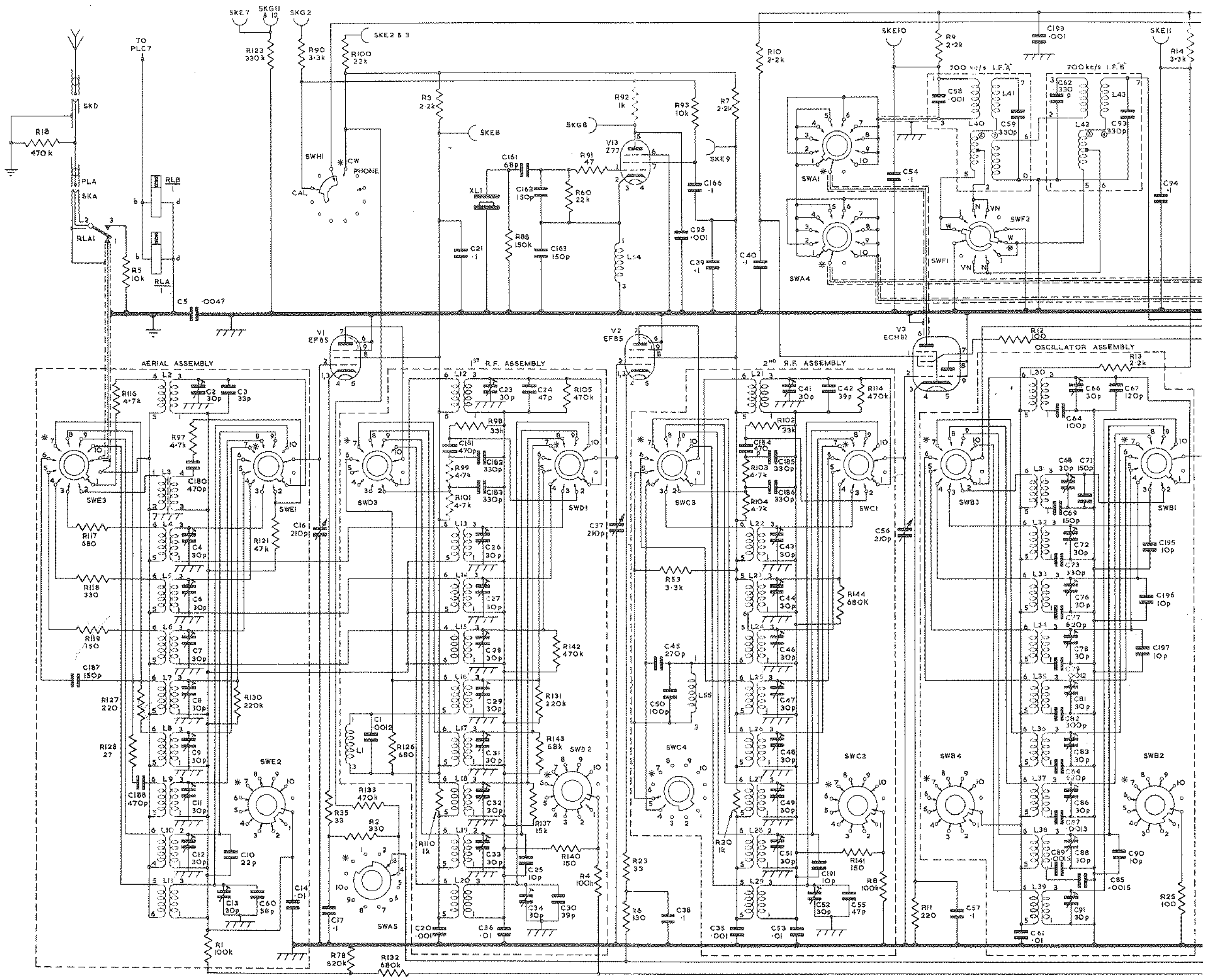
CCT. Ref.	Description	Value	Standard Identity	Remarks
RV2	Potentiometer, Inverse Log	5k $\Omega \pm 5\%$	WIS.6246/B Sh. 1, Ref. 2	Ganged with RV3, front section
RV3	Potentiometer, Log	5k $\Omega \pm 5\%$	WIS.6246/B Sh. 1, Ref. 2	Ganged with RV2, rear section
RV4	Potentiometer, Linear	100k $\Omega \pm 20\%$	WIS.4425/C Sh. 1, Ref. 32	
RV5	Potentiometer, Linear	100k $\Omega \pm 20\%$	WIS.4425/C Sh. 1, Ref. 32	Type 2207D (Muting)
	INDUCTORS & TRANSFORMERS			
L1	700 kc/s. Rejector		W.41193/B Sh. 46	
L2	Aerial Range 1		W.43991/B Sh. 1	
L3	Aerial Range 2, Ferroxcube		WIS.5680 Sh. 16	Not reqd. on type 2207A & B
L4	Aerial Range 3		W.41193/B Sh. 15	
L5	Aerial Range 4		W.41193/B Sh. 16	
L6	Aerial Range 5		W.41193/B Sh. 17	
L7	Aerial Range 6		W.41193/B Sh. 18	
L8	Aerial Range 7		W.41193/B Sh. 19	
L9	Aerial Range 8		W.41193/B Sh. 20	
L10	Aerial Range 9		W.41193/B Sh. 21	
L11	Aerial Range 10		W.47606/B Sh. 1	
L12	1st R.F. Range 1		W.43992/B Sh. 1	
L13	Bandpass Range 3		W.41193/B Sh. 41	
L14	Bandpass Range 4		W.41193/B Sh. 42	
L15	Bandpass Range 5		W.41193/B Sh. 43	
L16	1st R.F. Range 6		W.41193/B Sh. 36	
L17	1st R.F. Range 7		W.41193/B Sh. 37	
L18	1st R.F. Range 8		W.41193/B Sh. 38	
L19	1st R.F. Range 9		W.41193/B Sh. 39	
L20	1st R.F. Range 10		W.47605/B Sh. 1	

CCT. Ref.	Description	Value	Standard Identity	Remarks
L21	2nd R.F. Range 1		W.47681/B Sh. 1	
L22	2nd R.F. Range 3		W.41193/B Sh. 33	
L23	2nd R.F. Range 4		W.41193/B Sh. 34	
L24	2nd R.F. Range 5		W.41193/B Sh. 35	
L25	2nd R.F. Range 6		W.41193/B Sh. 36	
L26	2nd R.F. Range 7		W.41193/B Sh. 37	
L27	2nd R.F. Range 8		W.41193/B Sh. 38	
L28	2nd R.F. Range 9		W.41193/B Sh. 39	
L29	2nd R.F. Range 10		W.47605/B Sh. 1	
L30	Oscillator Range 1		W.41193/B Sh. 23	
L31	Oscillator Range 2		W.41193/B Sh. 24	Not reqd. on type 2207A & B
L32	Oscillator Range 3		W.41193/B Sh. 25	
L33	Oscillator Range 4		W.41193/B Sh. 26	
L34	Oscillator Range 5		W.41193/B Sh. 27	
L35	Oscillator Range 6		W.41193/B Sh. 28	
L36	Oscillator Range 7		W.41193/B Sh. 29	
L37	Oscillator Range 8		W.41193/B Sh. 30	
L38	Oscillator Range 9		W.41193/B Sh. 31	
L39	Oscillator Range 10		W.47604/B Sh. 1	
L40	700 kc/s. I.F.A. Anode		W.26958/B Sh. 165	
L41	700 kc/s I.F. "A", Secondary		W.26958/B Sh. 166	
L42	700 kc/s I.F. "B" Primary		W.26958/B Sh. 167	
L43	700 kc/s I.F. "B" Grid		W.26958/B Sh. 168	
L44	85 kc/s I.F., 1A, Anode		W.26958/B Sh. 223	
L45	85 kc/s I.F., 1A, Neutralising		W.26958/B Sh. 224	
L46	85 kc/s I.F., 1B, Secondary		W.46209/C Sh. 1, Edn. A	

CCT. Ref.	Description	Value	Standard Identity	Remarks
L47	85 kc/s I.F., 1C, Grid		W.26958/B Sh. 255	
L48	615 kc/s Oscillator		W.26958/B Sh. 222	
L49	85 kc/s I.F.2, Anode		W.26958/B Sh. 226	
L50	85 kc/s I.F.2, Grid		W.26958/B Sh. 227	
L51	85 kc/s I.F.3, Anode		W.26958/B Sh. 228	
L52	85 kc/s I.F.3, Diode		W.26958/B Sh. 229	
L53	86 kc/s B.F.0		W.26958/B Sh. 230	
L54	Crystal Calibrating		W.41193/B Sh. 44	
L55	Image Rejector		W.41193/B Sh. 45	
L56	85 kc/s I.F.1C, Primary		W.26958/B Sh. 225	
L57	85 kc/s I.F.1B, Primary		W.46208/C Sh. 1, Edn. A	
L58	A.F. Filter Choke	7H	WIS.5698/C Sh. 32	
L59	A.F. Filter Choke	4·5H	WIS.4385/C Sh. 1, Ref. 1	
L60	R.F. Filter Choke	2·25mH±10%	W.25913/C Sh. 1, Edn. C	
L61	R.F. Filter Choke	2·2mH±10%	W.25913/C Sh. 1, Edn. C	
L62 L63 TR1	Output Transformer		WIS.4385/C Sh. 1, Ref. 1	
	SWITCHES			
SWA	5 Pole, 10 Position		WIS.5555/C Sh. 168	SWA-SWE are ganged
SWB	4 Pole, 10 Position		WIS.5555/C Sh. 115	
SWC	4 Pole, 10 Position		WIS.5555/C Sh. 114	
SWD	3 Pole, 10 Position		WIS.5555/C Sh. 113	
SWE	3 Pole, 10 Position		WIS.5555/C Sh. 112	
SWF	2 Pole, 4 Position		WIS.5555/C Sh. 169	SWF & SWG are ganged
SWG	7 Pole, 4 Position		WIS.5555/C Sh. 170	
SWH	3 Pole, 4 Position		WIS.5555/C Sh. 167	

CCT. Ref.	Description	Value	Standard Identity	Remarks
SWJ	3 Pole, 4 Position		WIS.5555/C Sh. 184	
SWK	2 Pole, On-Off		WIS.3145/C Sh. 1, Ref. 4	
	VALVES			
V1	EF.85			
V2	EF.85			
V3	ECH.81			
V4	EF.85			
V5	ECH.81			
V6	W.77			
V7	Z.77			
V8	D.77			
V9	ECH.81			
V10	6060			
V11	N.37			
V12	QS.75/20			
V13	Z.77			
V14	ECH.81			Only reqd. on type 2207D (Muting)
	RECTIFIERS			
MR1	Selenium, Single Plate		WIS.6230/C Sh. 1, Ref. 1	
MR2	Selenium, Single Plate		WIS.6230/C Sh. 1, Ref. 1	
MR3	Selenium, Single Plate		WIS.6230/C Sh. 1, Ref. 1	
MR4	Selenium, Single Plate		WIS.6230/C Sh. 1, Ref. 1	
MR5	Selenium, Single Plate		WIS.6230/C Sh. 1, Ref. 1	
MR6	Selenium, Single Plate		WIS.6230/C Sh. 1, Ref. 1	
MR7	Selenium, Single Plate		WIS.6230/C Sh. 1, Ref. 1	For type 2207D (Muting)
	PLUGS & SOCKETS			
PLA	Plug, Co-Axial		WIS.3956/C Sh. 1, Ref. 2	
PLB	Plug, 8 Way		WIS.3737/C Sh. 1, Ref. 8	
PLC	Plug, 12 Way		WIS.3737/C Sh. 1, Ref. 9	
SKA	Socket, Co-Axial		WIS.3956/C Sh. 1, Ref. 3	
SKB	Socket, 8 Way		WIS.3729/C Sh. 1, Ref. 7	
SKC	Socket, 12 Way		WIS.3729/C Sh. 1, Ref. 8	
SKD	Socket, Co-Axial		WIS.3956/C Sh. 1, Ref. 7	

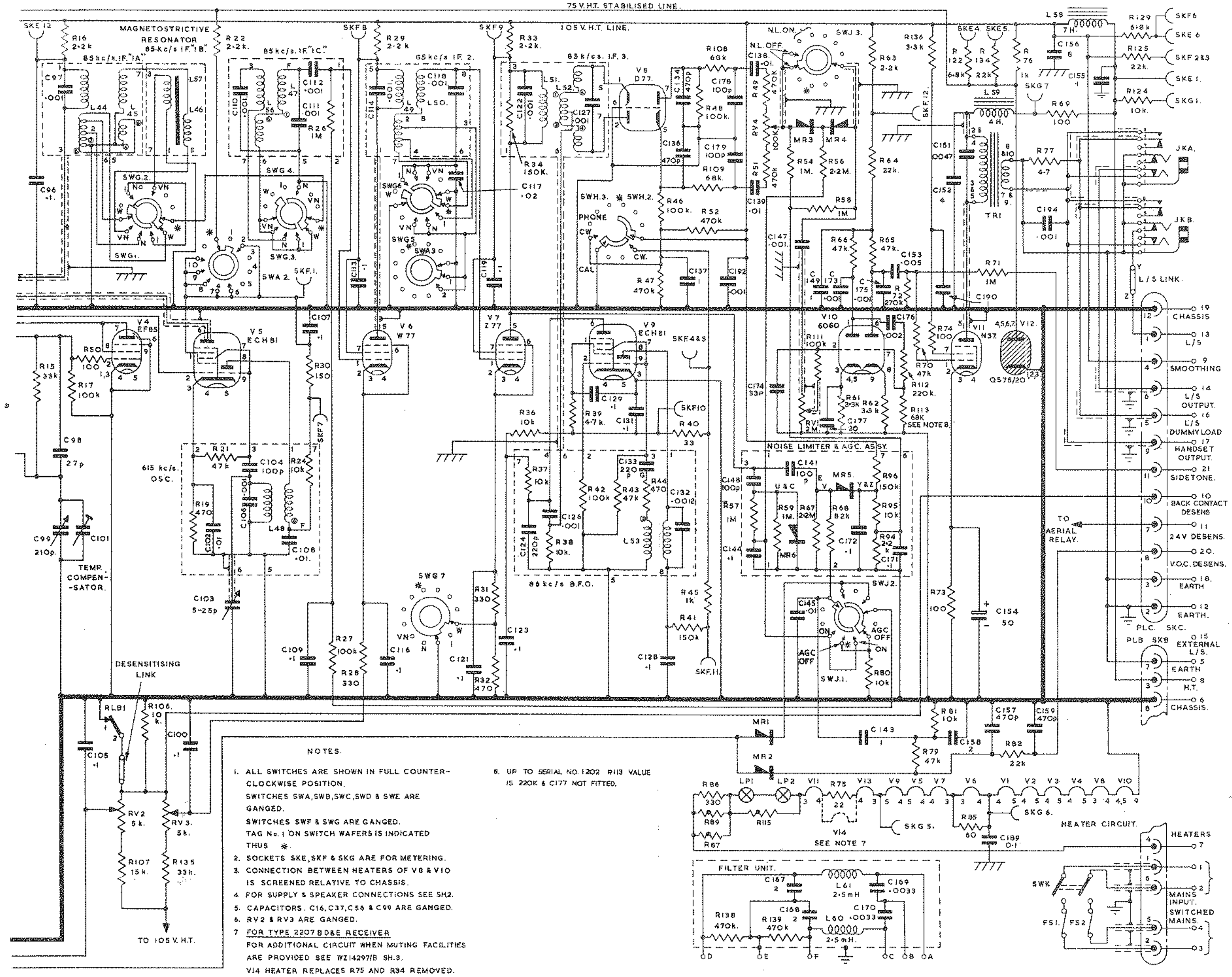
CCT. Ref.	Description	Value	Standard Identity	Remarks
SKE	Socket, 12 Way		WIS.3731/C Sh. 1, Ref. 5	
SKF	Socket, 12 Way		WIS.3731/C Sh. 1, Ref. 5	
SKG	Socket, 12 Way		WIS.3731/C Sh. 1, Ref. 5	
	MISCELLANEOUS ELECTRICAL ITEMS			
FS1	Fuse, Cartridge, Ceramic	1A.	WIS.6294/C Sh. 1, Ref. 3	
FS2	Fuse, Cartridge, Ceramic	1A.	WIS.6294/C Sh. 1, Ref. 3	
JKA	Jack, 8 point		WIS.3150/C Sh. 1, Ref. 1	
JBK	Jack, 8 Point		WIS.3150/C Sh. 1, Ref. 1	
LP1	Lamp, E.10, 4 V. 1·2W.		PC.48704/1	
LP2	Lamp, E.10, 4V. 1·2W.		PC.48704/1	
RLA	Relay, High Speed, Non-Polarised		PC.65201/4	
RLB	Relay, High Speed, Non-Polarised		PC.65201/4	
RLC	Relay, High Speed, Non-Polarised		PC.65201/5	Only reqd. on type 2207D (Muting)
XL1	Quartz Crystal	700 kc/s.		M.W.T. type 2126A. Code 200/B/50
	MISCELLANEOUS MECHANICAL ITEMS			
1	Valve Holder, B9A		PC.81816/1	For V1, V2, V3, V4, V5, V9, V10, V14
2	Valve Can		PC.17502/3	For V1, V2, V3, V4, V5, V9
3	Valve Can		PC.17502/2	For V10, V14
4	Valve Holder, B7G		PC.81811/1	For V6, V7, V8, V11, V12, V13
5	Valve Can		PC.17501/2	For V6, V7, V8, V12, V13
6	Valve Can		WIS.5678/C Sh. 1, Ref. 12	For V11
7	Crystal Holder		W.7703/1 Sh. 1, Edn. A	For XL1
8	Drive Cord		W.50257/C Sh. 1, Edn. A	For frequency pointer
9	Drive Cord		W.50257/C Sh. 1, Edn. A	For bandspread pointer
10	Cord, Range Switch			Flax line E701, "Hibernia". Breaking strain 17 lbs. S. Allcock & Co. Ltd., Redditch.
11	Pin, Groverlok		WIS.5729/C Sh. 1, Ref. 54B	



Issue No. 4
Sheet No. 1

W.50259

CIRCUIT DIAGRAM "ATALANTA" RECEIVER TYPE 2207C
(PART 1)



NOTES.

1. ALL SWITCHES ARE SHOWN IN FULL COUNTER-CLOCKWISE POSITION.
   SWITCHES SWA, SWB, SWC, SWD & SWE ARE GANGED.
   SWITCHES SWF & SWG ARE GANGED.
   TAG No. 1 ON SWITCH WAFERS IS INDICATED THUS ✳.
2. SOCKETS SKE, SKF & SKG ARE FOR METERING.
3. CONNECTION BETWEEN HEATERS OF V8 & V10 IS SCREENED RELATIVE TO CHASSIS.
4. FOR SUPPLY & SPEAKER CONNECTIONS SEE SH.2.
5. CAPACITORS. C16, C37, C56 & C99 ARE GANGED.
6. RV2 & RV3 ARE GANGED.
7. FOR TYPE 2207 B D&E RECEIVER
   FOR ADDITIONAL CIRCUIT WHEN MUTING FACILITIES ARE PROVIDED SEE WZ14297/B SH.3.
   V14 HEATER REPLACES R75 AND R34 REMOVED.
8. UP TO SERIAL NO. 1202 R113 VALUE IS 220K & C177 NOT FITTED.

Issue No. 7
Sheet No. 2

W.50259

CIRCUIT DIAGRAM "ATALANTA" RECEIVER TYPE 2207C (PART 2)

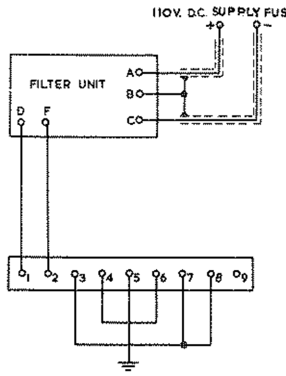


FIG. 1 110V D.C.

NOTES.

1. SUPPLY LEAD CLAMPS ARE SUITABLE FOR 3/·029" SINGLE LEAD COVERED CABLE OR FLAT 3/·029" TWIN LEAD COVERED OF SIMILAR THICKNESS.
2. SUPPLY LEAD SCREENING MUST BE CARRIED INTO FILTER BOX.
3. CASE EARTH BOLT MUST BE CONNECTED DIRECT TO EARTH USING COPPER STRIP.
4. TWO FUSES OF 1 AMP. RATING ARE FITTED.
5. LINKS ARE CONNECTED TO TERMINAL BLOCKS AS SHOWN.

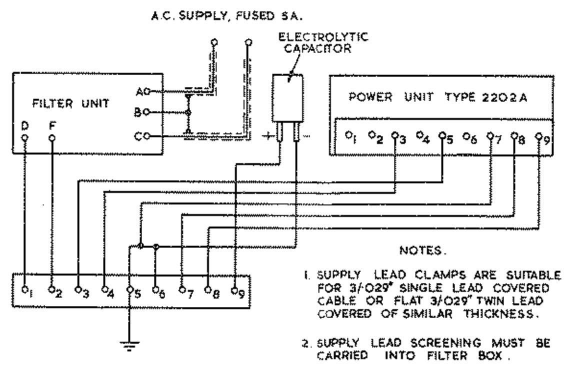


FIG.2 230 OR 115V A.C.

NOTES.

1. SUPPLY LEAD CLAMPS ARE SUITABLE FOR 3/·029" SINGLE LEAD COVERED CABLE OR FLAT 3/·029" TWIN LEAD COVERED OF SIMILAR THICKNESS.
2. SUPPLY LEAD SCREENING MUST BE CARRIED INTO FILTER BOX.
3. CASE EARTH BOLT MUST BE CONNECTED DIRECT TO EARTH USING COPPER STRIP.
4. TWO FUSES OF 1 AMP. RATING ARE FITTED.
5. PROVISION IS MADE FOR THE A.C. POWER UNIT TYPE 2202A TO BE MOUNTED IN THE REAR OF THE RECEIVER CABINET.
6. TRANSFORMER PRIMARY TAPS ARE ADJUSTED TO SUIT SUPPLY VOLTAGE BEFORE FITTING.
7. THE 32μF ELECTROLYTIC CAPACITOR SUPPLIED WITH THE POWER UNIT MUST ALSO BE MOUNTED IN THE REAR OF THE CASE ABOVE THE TERMINAL BLOCK.
8. CONNECTIONS FROM TERMINAL BLOCK TO POWER UNIT & CAPACITOR SHOULD BE MADE WITH LEADS PROVIDED. LINKS TO BE ARRANGED AS SHOWN.

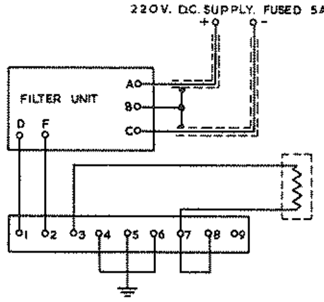


FIG. 3a 220V D.C.

NOTES.

1. SUPPLY LEAD CLAMPS ARE SUITABLE FOR 3/·029" SINGLE LEAD COVERED CABLE OR FLAT 3/·029" TWIN LEAD COVERED OF SIMILAR THICKNESS.
2. SUPPLY LEAD SCREENING MUST BE CARRIED INTO FILTER BOX.
3. CASE EARTH BOLT MUST BE CONNECTED DIRECT TO EARTH USING COPPER STRIP.
4. TWO FUSES OF 1 AMP. RATING ARE FITTED.
5. WHEN THE DROPPING RESISTOR (B.E.R.Co. 260Ω VGHK5 IN COVER SA 69) IS MOUNTED ON THE REAR OF RECEIVER CASE, THE CONNECTIONS & LINKS TO TERMINAL BLOCK ARE AS SHOWN IN FIG.3a.
6. WHEN RESISTOR UNIT IS MOUNTED REMOTELY, CONNECTIONS & LINKS ARE AS SHOWN IN FIG.3b. A JUNCTION BOX WILL BE NECESSARY IF TWIN CABLE IS EMPLOYED.

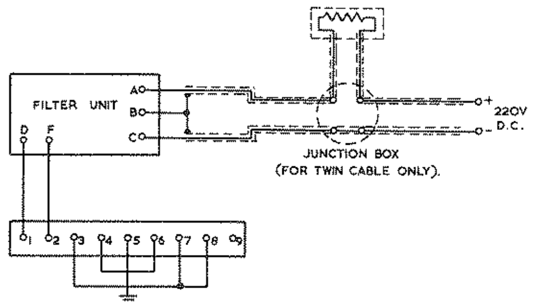


FIG.3b 220V D.C.

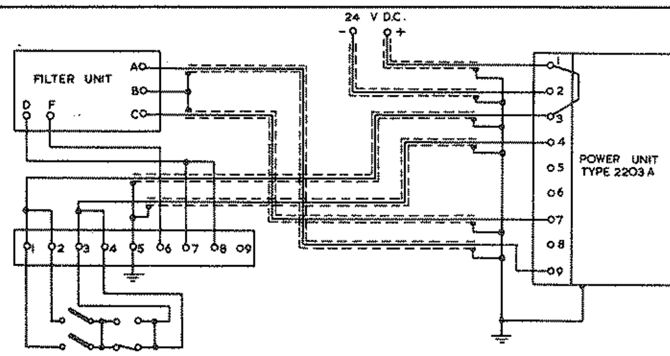
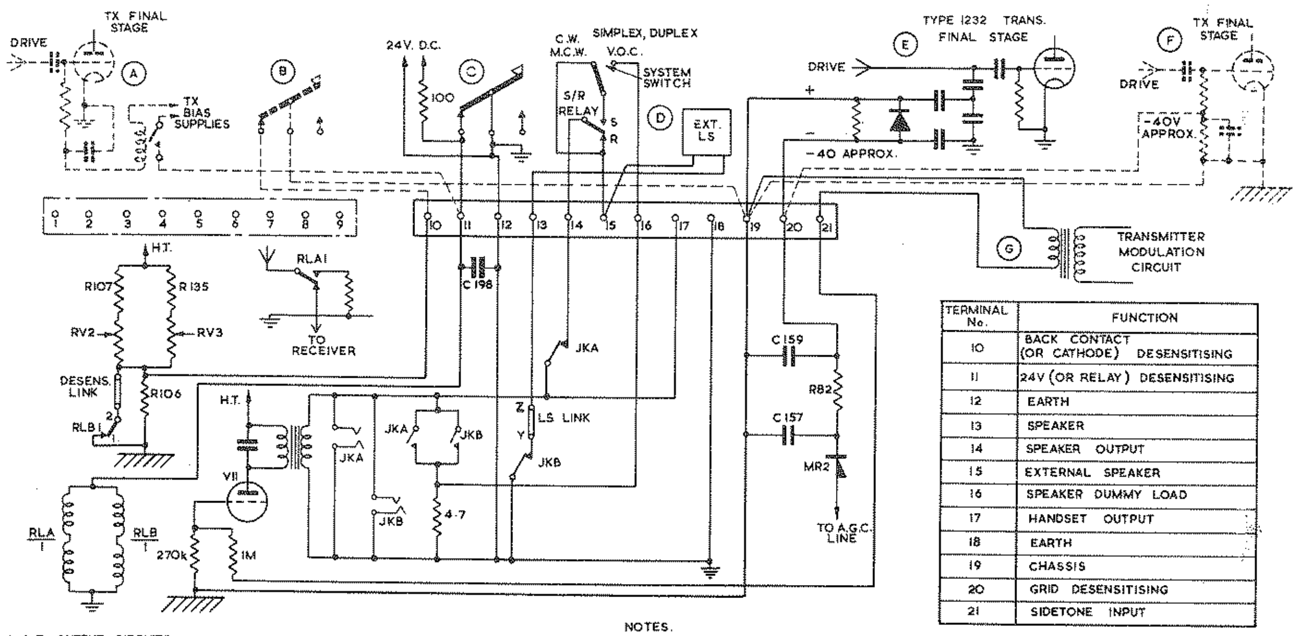


FIG. 4 24V D.C.

NOTES.

1. ALL LEADS ENTERING OR LEAVING THE RECEIVER CASE MUST BE SCREENED OR LEAD COVERED, WITH THE SCREENING CARRIED INSIDE THE CASE AS FAR AS POSSIBLE & SECURELY BONDED.
2. THE SCREENING OF THE 110V. SUPPLY LINE FROM THE POWER UNIT TYPE 2203A MUST BE CARRIED INTO THE FILTER BOX.
3. CASE EARTH BOLT MUST BE CONNECTED DIRECT TO EARTH USING COPPER STRIP.
4. THE 24V SUPPLY LEADS MUST BE KEPT AS SHORT AS POSSIBLE (WITH 3/·029" THE TOTAL LOOP LENGTH MUST NOT EXCEED 20 FT.). THE VOLTAGE DROP IN THESE LEADS MUST NOT EXCEED 0·5V.
5. IN ORDER TO REDUCE VOLTAGE DROP IN THE RECEIVER WIRING, THE INTERNAL LEADS ARE PARALLELED. THIS INVOLVES THE PARALLEL CONNECTION OF THE TWO FUSEHOLDERS, END CONTACT TO END CONTACT, SIDE CONTACT TO SIDE CONTACT, WITH SHORT LINKS OF 14/·0076" FLEXIBLE CABLE; OR BY TRANSFERRING THE CONNECTIONS FROM THE RIGHT HAND FUSEHOLDER TO THE LEFT HAND FUSEHOLDER (END CONNECTION TO END CONNECTION, SIDE CONNECTION TO SIDE CONNECTION). THE TWO 1AMP. FUSES ARE THEN WITHDRAWN & REPLACED BY A SINGLE 7·5 AMP FUSE, FITTED IN THE LEFT HAND FUSEHOLDER.



TERMINAL No.	FUNCTION
10	BACK CONTACT (OR CATHODE) DESENSITISING
11	24V (OR RELAY) DESENSITISING
12	EARTH
13	SPEAKER
14	SPEAKER OUTPUT
15	EXTERNAL SPEAKER
16	SPEAKER DUMMY LOAD
17	HANDSET OUTPUT
18	EARTH
19	CHASSIS
20	GRID DESENSITISING
21	SIDETONE INPUT

1. A.F. OUTPUT CIRCUITS.

1·1 HEADPHONE OUTPUT ONLY.
- 1·1·1 LINK 16 & 17.
- 1·1·2 L.R. (600Ω) 'PHONES INSERTED INTO EITHER FRONT PANEL JACK.
- 1·1·3 EXTERNAL L.R. 'PHONES CONNECTED BETWEEN 17 & 18.

1·2 HANDSET OUTPUT ONLY.
- 1·2·1 LINK 16 & 17.
- 1·2·2 CONNECT HANDSET BETWEEN 17 & 18.
- 1·2·3 IF ATTENUATION OF HANDSET SIGNAL IS NECESSARY, A SERIES RESISTOR SHOULD BE USED.

1·3 EXTERNAL LOUDSPEAKER – DIRECT CONNECTION.
- 1·3·1 CONNECT LOUDSPEAKER (5Ω) BETWEEN 17 & 18.
- 1·3·2 ALL A.F. SWITCHING IS NOW INOPERATIVE.
- 1·3·3 INSERTION OF 'PHONES REDUCES OUTPUT BY 3db.

1·4 EXTERNAL LOUDSPEAKER – JACK SWITCHING.
- 1·4·1 LINK Y & Z ON SPEAKER CONNECTION TAGBOARD (MOUNTED BELOW CHASSIS).
- 1·4·2 LINK 14 & 15.
- 1·4·3 CONNECT LOUDSPEAKER (5Ω) BETWEEN 13 & 15.

1·5 EXTERNAL LOUDSPEAKER – JACK & TRANSMITTER SWITCHING.
- 1·5·1 LINK Y & Z ON SPEAKER CONNECTION TAGBOARD.
- 1·5·2 CONNECT LOUDSPEAKER BETWEEN 13 & 15.
- 1·5·3 CONNECT TRANSMITTER LINES AS SHOWN AT "D" (SYSTEM SHOWN IS FOR TYPE 1232 TRANSMITTER & IS TYPICAL).

1·6 INTERNAL LOUDSPEAKER – JACK SWITCHING.
- 1·6·1 CONNECT INTERNAL LOUDSPEAKER TO Y & Z ON SPEAKER CONNECTION TAGBOARD.
- 1·6·2 LINK 13 & 14.

1·7 INTERNAL LOUDSPEAKER – JACK & TRANSMITTER SWITCHING.
- 1·7·1 CONNECT INTERNAL LOUDSPEAKER TO Y & Z ON SPEAKER CONNECTION TAGBOARD.
- 1·7·2 LINK 13 & 15.
- 1·7·3 CONNECT TRANSMITTER LINES AS SHOWN AT "D" (SYSTEM SHOWN IS FOR TYPE 1232 TRANSMITTER & IS TYPICAL).

NOTES.

2. DESENSITISING.

2·1 RELAY DESENSITISING & AERIAL PROTECTION
- 2·1·1 IF A KEYING RELAY MAKE CONTACT IS AVAILABLE, 24V D.C. MAY BE APPLIED THROUGH THIS DIRECTLY TO TERMINALS 11 & 12 (EARTH).
- 2·1·2 WHERE ONLY THE KEY IS AVAILABLE, THE BACK CONTACT MAY BE UTILISED AS SHOWN AT "C" TO APPLY 24V D.C.
- 2·1·3 WITH TYPE 1232 OR SIMILAR TRANSMITTERS, THE FINAL STAGE GRID CURRENT IS USED TO OPERATE A RELAY AS AT "A", THIS RELAY OPERATING RLA & RLB FROM THE TX BIAS SUPPLIES; A 24V D.C. SUPPLY IS NOT REQUIRED.

2·2 CATHODE DESENSITISING.
- 2·2·1 THE BACK CONTACTS OF THE KEY ARE CONNECTED AS AT 'B', THE DESENSITISING LINK BEING DISCONNECTED.
- 2·2·2 WITH THIS SYSTEM CHASSIS & KEY ARE BONDED SO THAT:–
  - 2·2·2·1 THE CHASSIS MUST BE EARTHED, OR
  - 2·2·2·2 THE KEY MUST BE ISOLATED FROM EARTH.

2·3 GRID DESENSITISING (SEE NOTE 4).
- 2·3·1 A NEGATIVE VOLTAGE OF 40–50 VOLTS IS APPLIED TO THE A.G.C LINE VIA TERMINAL 20. THIS MAY BE DERIVED FROM THE FINAL STAGE GRID AS AT "F", WHERE THE RECEIVER CHASSIS IS CONNECTED TO TRANSMITTER CHASSIS.
- 2·3·2 WHERE RECEIVER CHASSIS & TRANSMITTER CHASSIS MAY NOT BE LINKED, THE CIRCUIT USED ON TYPE 1232 TRANSMITTER (SHOWN AT "E") MUST BE USED.

3. SIDETONE (SEE NOTE 4).
- 3·1 SIDETONE IS TAKEN FROM A TRANSFORMER WINDING IN THE TRANSMITTER MODULATOR CHAIN AS AT "G" & APPLIED TO TERMINALS 21 & 19 (CHASSIS) AT AN APPROPRIATE LEVEL (APPROX 15V R.M.S.)

4. CONNECTIONS FOR GRID DESENSITISING & SIDETONE.
- 4·1 WHEN OPERATING WITH FLOATING CHASSIS, IT IS NECESSARY, TO MINIMISE NOISE PICK-UP, THAT THESE LEADS SHOULD BE RUN IN DOUBLE SCREENED CABLE, THE INNER SCREEN CONNECTED TO CHASSIS, THE OUTER SCREEN TO EARTH.

Issue No. 6
Sheet No. 2

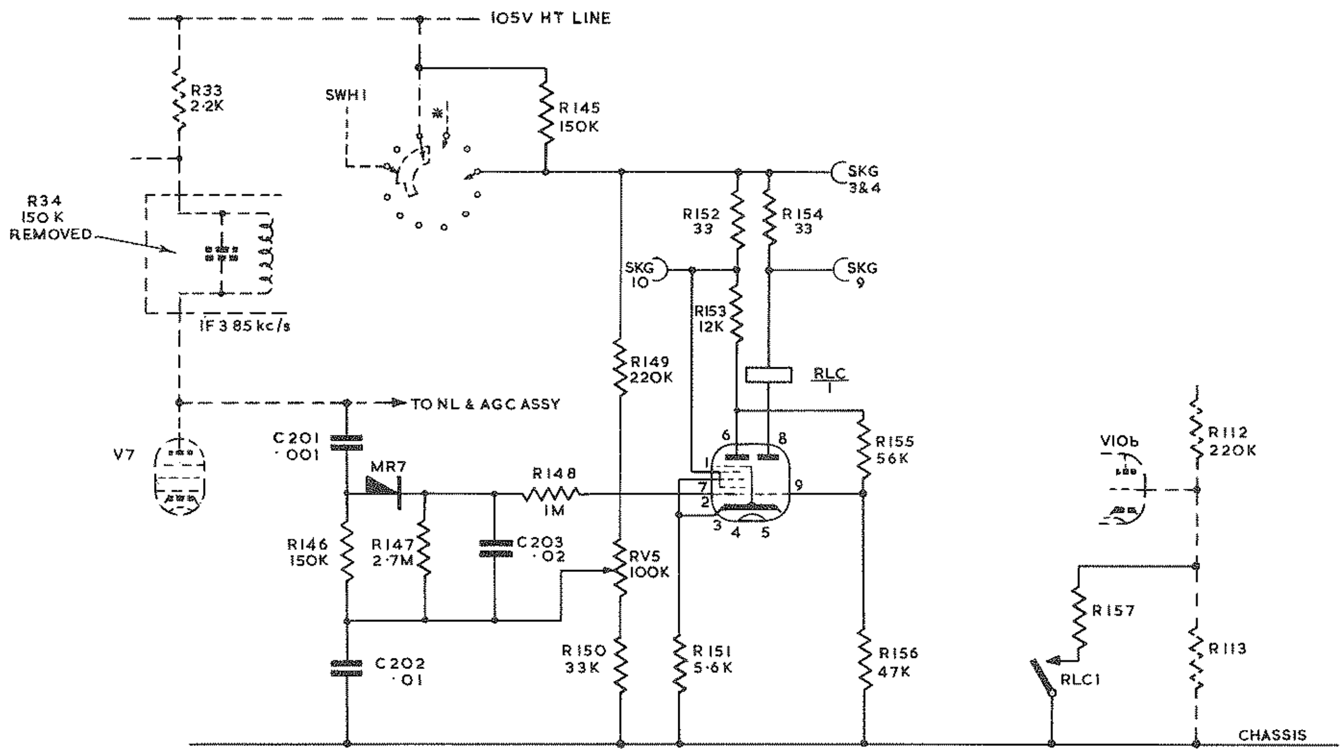
WZ.14297/D

CIRCUIT DIAGRAM "ATALANTA" RECEIVER TYPE 2207C

Issue No. 1
Sheet No. 3

CIRCUIT DIAGRAM "ATALANTA" RECEIVER
(ADDITIONAL CIRCUIT FOR MUTING)

WZ.14297/B



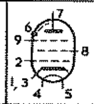
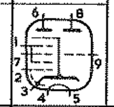
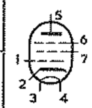
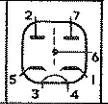
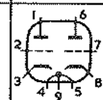
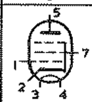
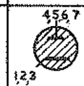
TYPE 2207 D RECEIVER ONLY

ADDITIONAL CIRCUIT TO PROVIDE MUTING FACILITIES SHOWN IN FULL LINES.

NOTE.
UP TO SERIAL NO. 1202, R113 VALUE 220K
R157 VALUE 10K
FOR SERIAL NO 1203 & ON R113 VALUE 68 K
R157 VALUE 5·6 K.

VALVE DATA TABLE "ATALANTA" RECEIVER TYPE 2207C

WZ.14093/B

UNITS ON WHICH USED.	CIRCUIT DIAGRAM.	CIRCUIT REFERENCE	VALVE TYPE.	PIN CONNECTIONS. 1	2	3	4	5	6	7	8	9	TC	THEORETICAL DIAGRAM.	VIEW OF UNDERSIDE OF VALVE BASE.
TYPE 2207A-E RECEIVER	WZ14297/D SH. 1	V1 V2 V4	EF 85	CATHODE	GRID 1	CATHODE	HEATER	HEATER	SCREEN	ANODE	GRID 2	GRID 3	—		B9A 
		V3 V5 V9 ✻ V14	ECH 81	GRID 2 GRID 4	GRID 1	CATHODE GRID 5 SCREEN	HEATER	HEATER	ANODE HEPTODE	GRID 3	ANODE TRIODE	GRID TRIODE	—		
		V6	W 77	GRID 1	CATHODE	HEATER	HEATER	ANODE	GRID 3	GRID 2	—	—	—		B7G 
		V7 V13	Z 77	GRID 1	CATHODE	HEATER	HEATER	ANODE	GRID 3	GRID 2	—	—	—		
		V8	D 77	CATHODE″	ANODE′	HEATER	HEATER	CATHODE′	SHIELD	ANODE″	—	—	—		
		V10	6060	ANODE″	GRID″	CATHODE″	HEATER	HEATER	ANODE′	GRID′	CATHODE′	HEATER TAP	—		B9A 
		V11	N 37	GRID 1	CATHODE	HEATER	HEATER	ANODE	INTERNAL CONNECT'N	GRID 2	—	—	—		B7G 
		V12	QS 75/20	CATHODE	PIN 1	PIN 1	ANODE	PIN 4	PIN 4	PIN 4	—	—	—		

✻ V14 USED ON TYPE 2207B & D ONLY

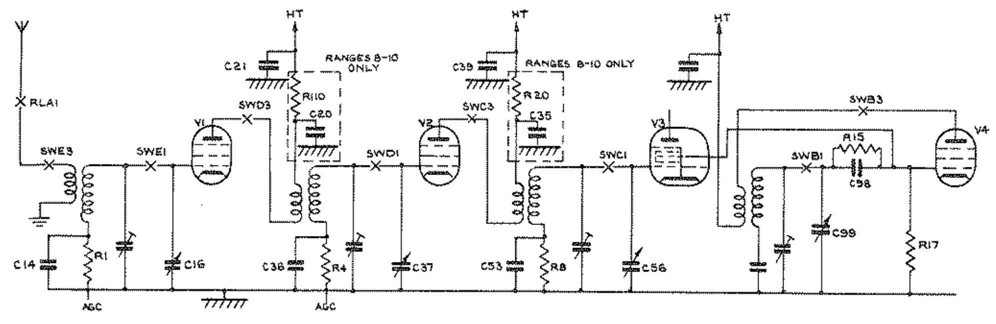


DIAGRAM A. RF AMPLIFIER, RANGES 1 & 6–10. AND 1ST OSCILLATOR, RANGES 1–10.

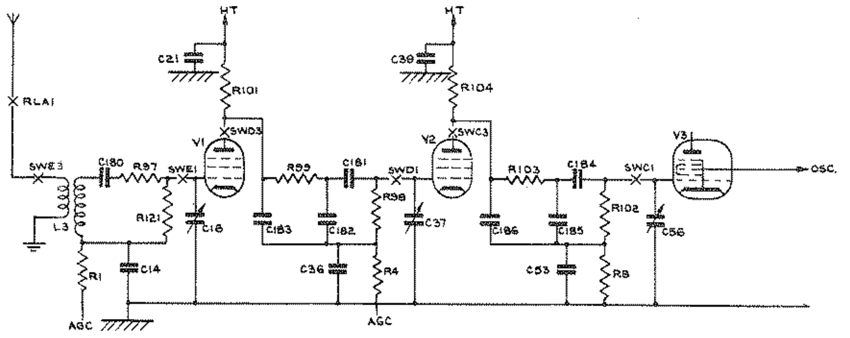


DIAGRAM B. RF AMPLIFIER, RANGE 2.

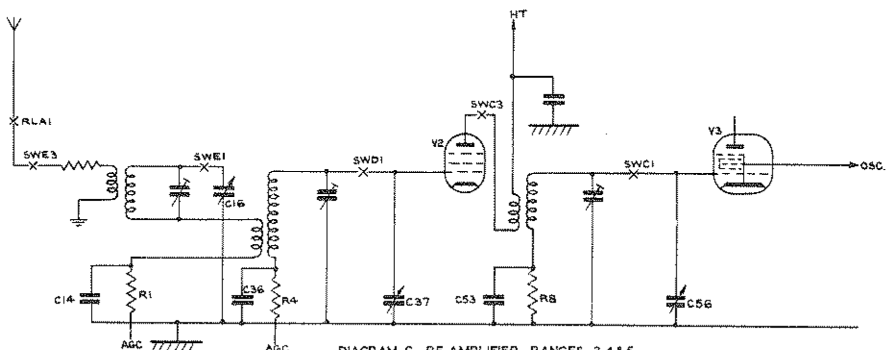


DIAGRAM C. RF AMPLIFIER, RANGES 3, 4 & 5.

FIG. 1. RF AMPLIFIER & 1ST OSCILLATOR SIMPLIFIED CIRCUITS.

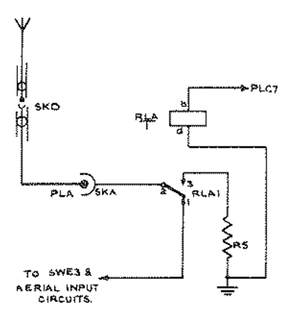


FIG. 2. AERIAL CIRCUIT PROTECTION.
(ONLY AVAILABLE WHEN 24V. DC.15 APPLIED)

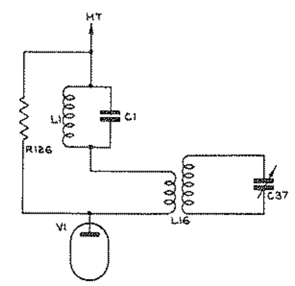


FIG. 4. RANGE 6 IF REJECTOR.

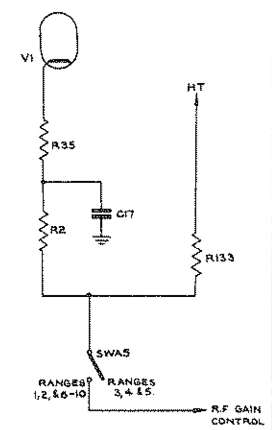


FIG. 3. V1 CATHODE VOLTAGE SWITCHING.

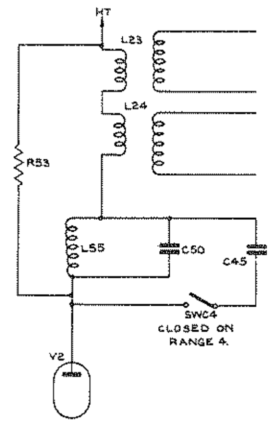


FIG. 5. RANGES 4 & 5 IMAGE REJECTOR.

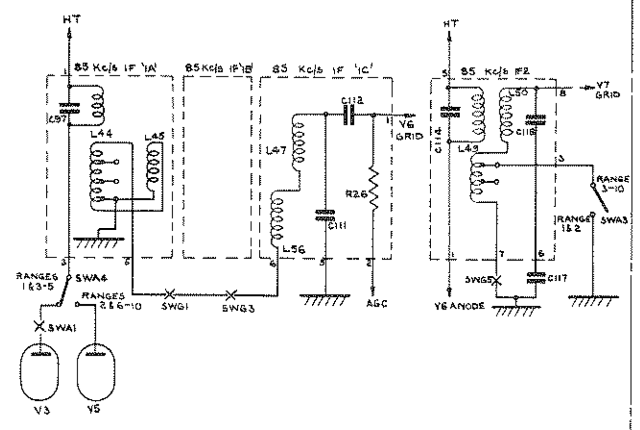


DIAGRAM A. WIDE PASSBAND.

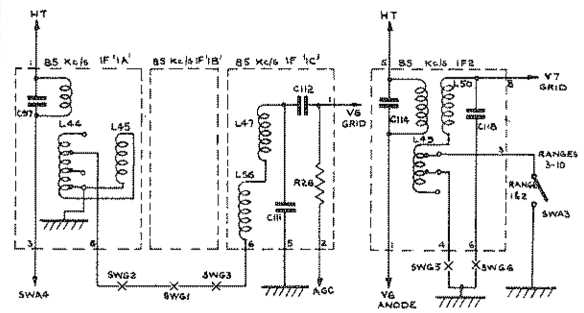


DIAGRAM B. INTERMEDIATE PASSBAND.

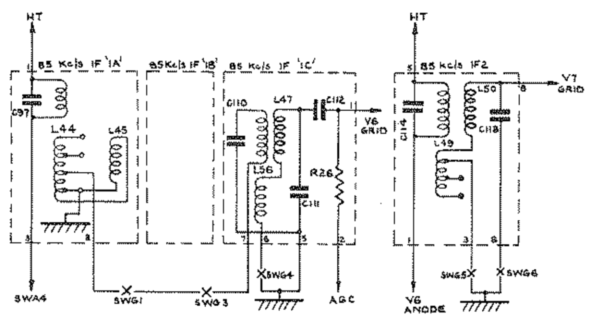


DIAGRAM C. NARROW PASSBAND.

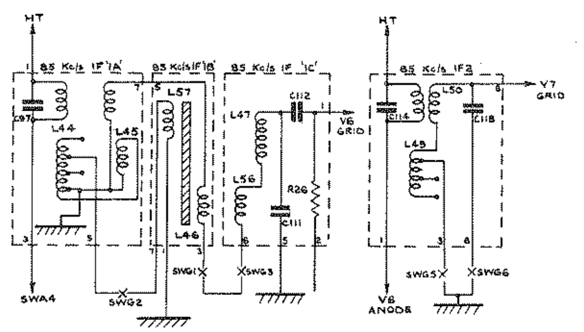


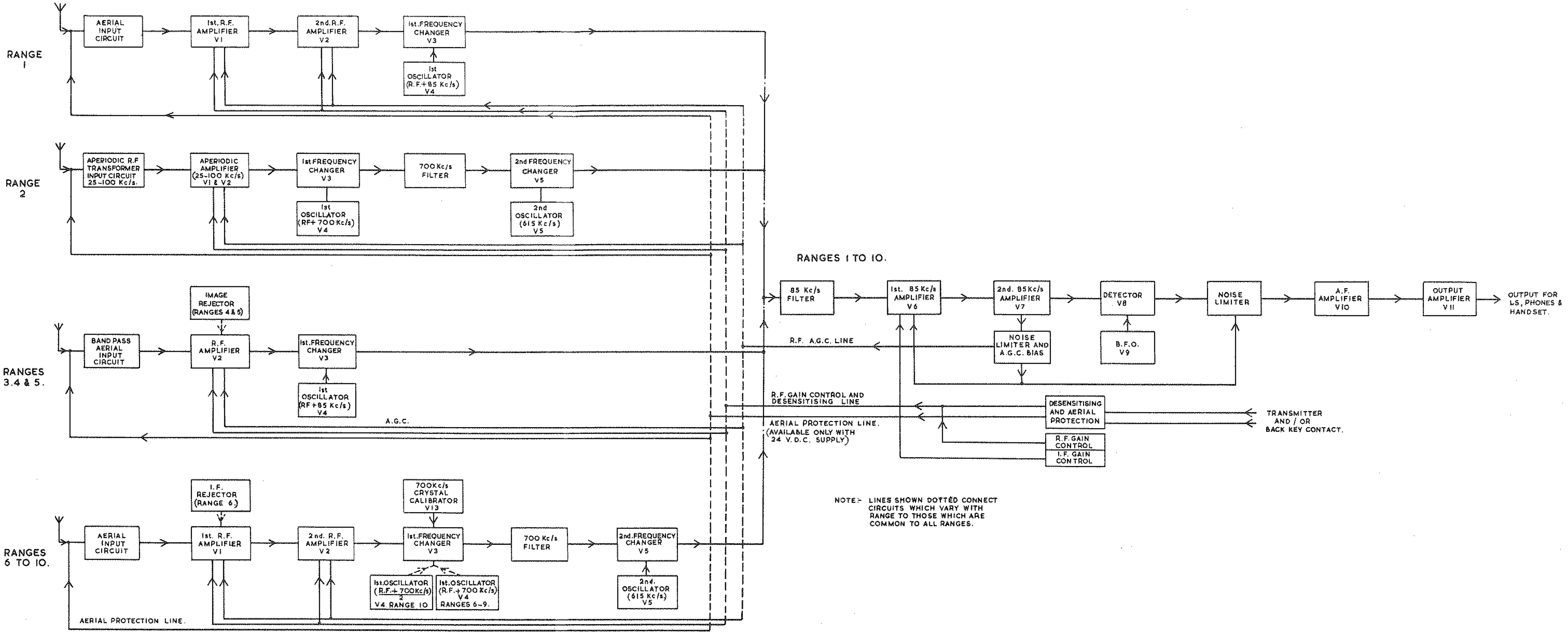
DIAGRAM D. VERY NARROW PASSBAND.

FIG. 6. 85 KC/S IF CIRCUITS.
(WIDE, INTERMEDIATE, NARROW AND VERY NARROW POSITIONS OF PASSBAND SWITCH.)

Issue No. 1
Sheet No. 1

WZ.18294/D

SIMPLIFIED CIRCUITS "ATALANTA" RECEIVER TYPE 2207C



Issue No. 1
Sheet No. 1

WZ.18293/D

BLOCK SCHEMATIC "ATALANTA" RECEIVER TYPE 2207C

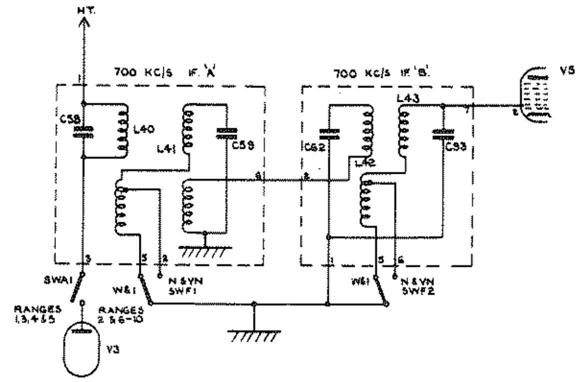


FIG. 7. 700 KC/S IF CIRCUITS.
(WIDE & INTERMEDIATE PASSBAND.)

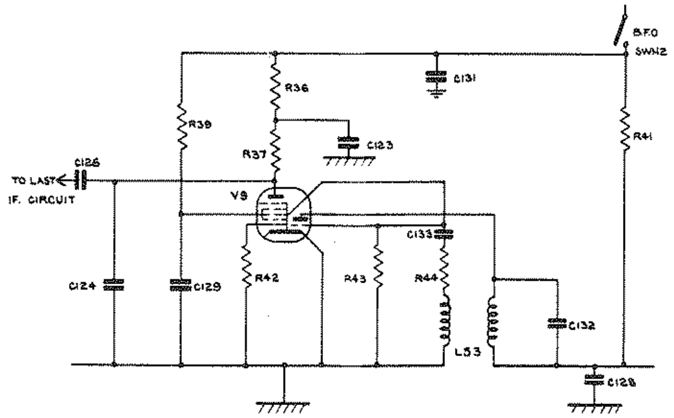


FIG. 9. B.F.O. CIRCUITS.
(TRIODE OSC & HEPTODE BUFFER)

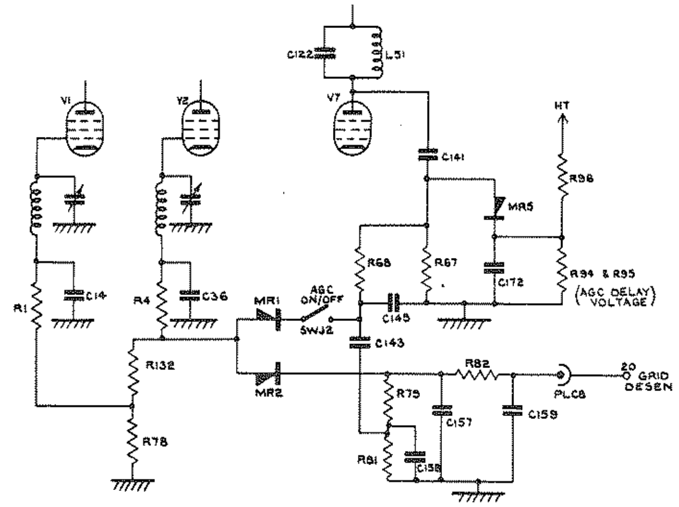


FIG. 11. GRID DESENSITISING & RF VALVES AGC SYSTEM.

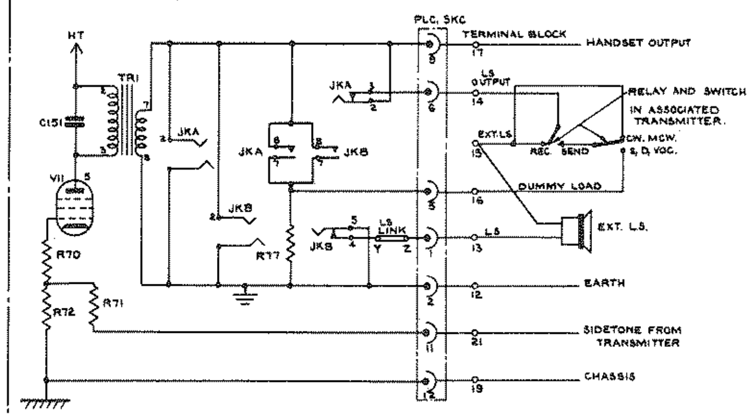


FIG 13. AF OUTPUT & SIDETONE CIRCUITS.

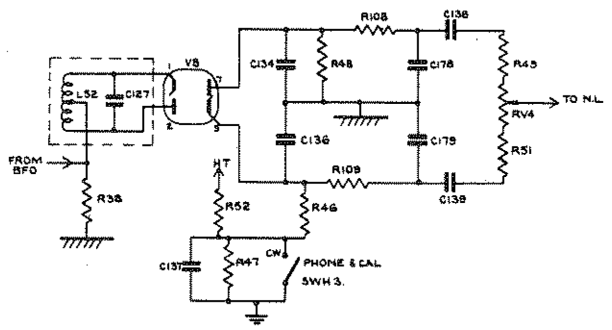


FIG 8. DETECTOR

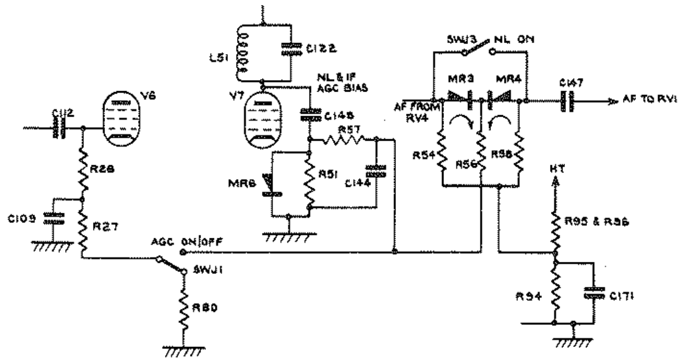


FIG. 10. NL & IF AGC CIRCUITS.

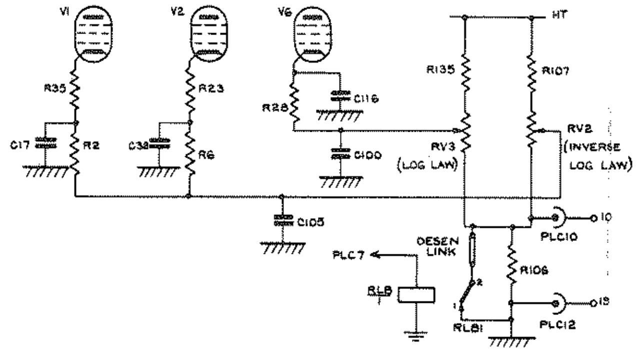


FIG.12. RF GAIN CONTROL AND CATHODE DESENSITISING SYSTEM.
(USING KEYED 24V D.C. SUPPLY.)

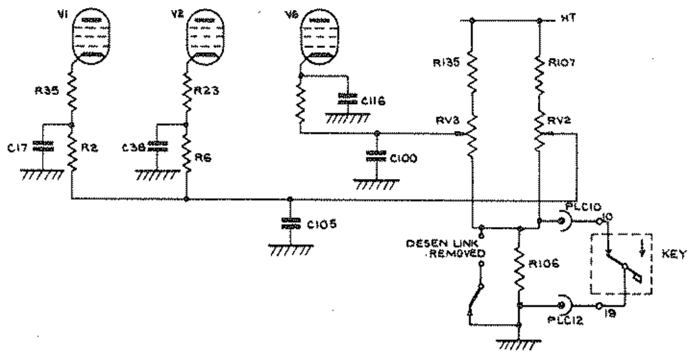
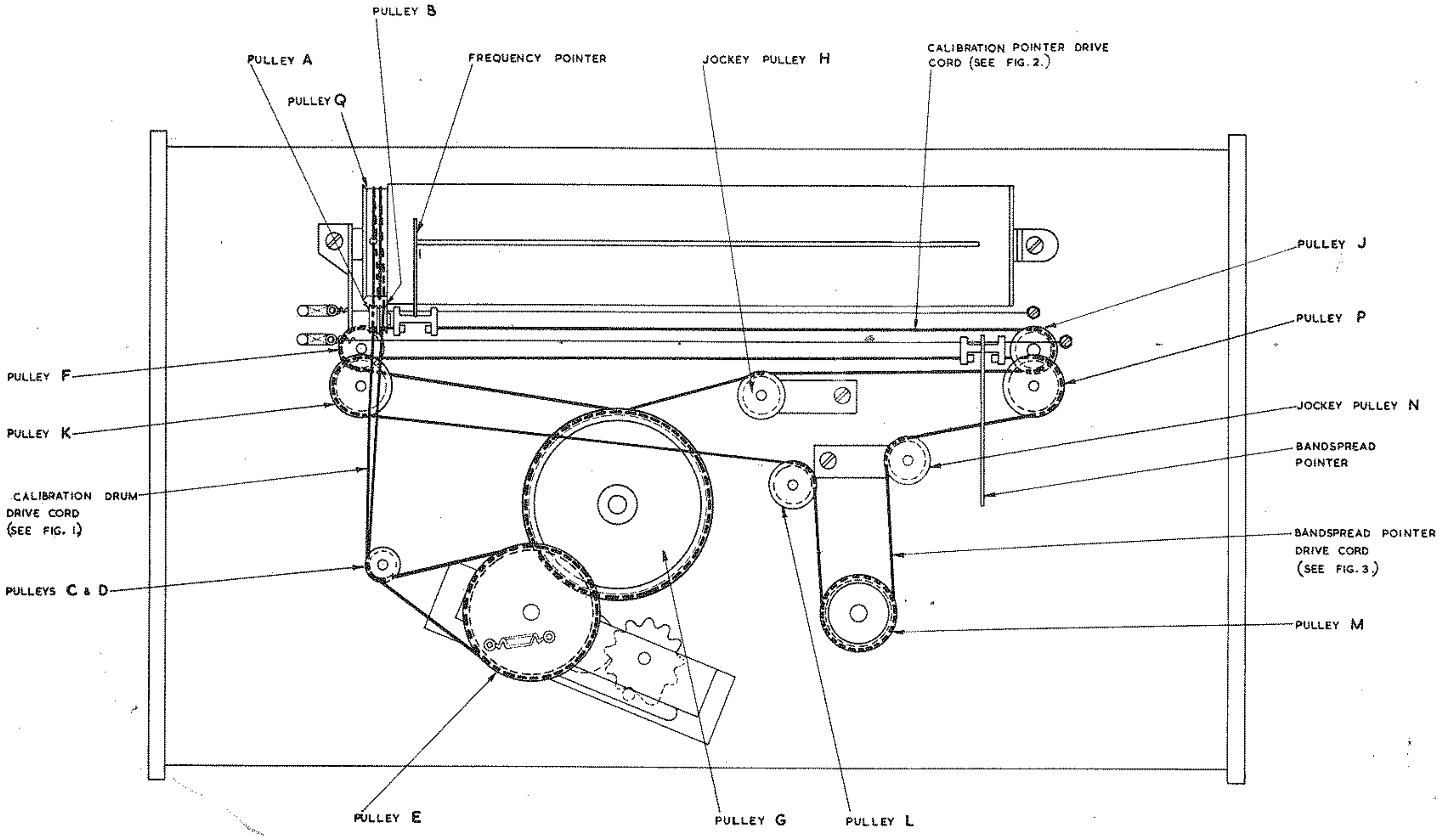


FIG. 13. RF GAIN CONTROL AND CATHODE DESENSITISING SYSTEM.
(USING KEY BACK CONTACTS.)

Issue No. 1
Sheet No. 2

WZ.18294/D

SIMPLIFIED CIRCUITS "ATALANTA" RECEIVER TYPE 2207C



FRONT VIEW OF INNER FRONT PANEL

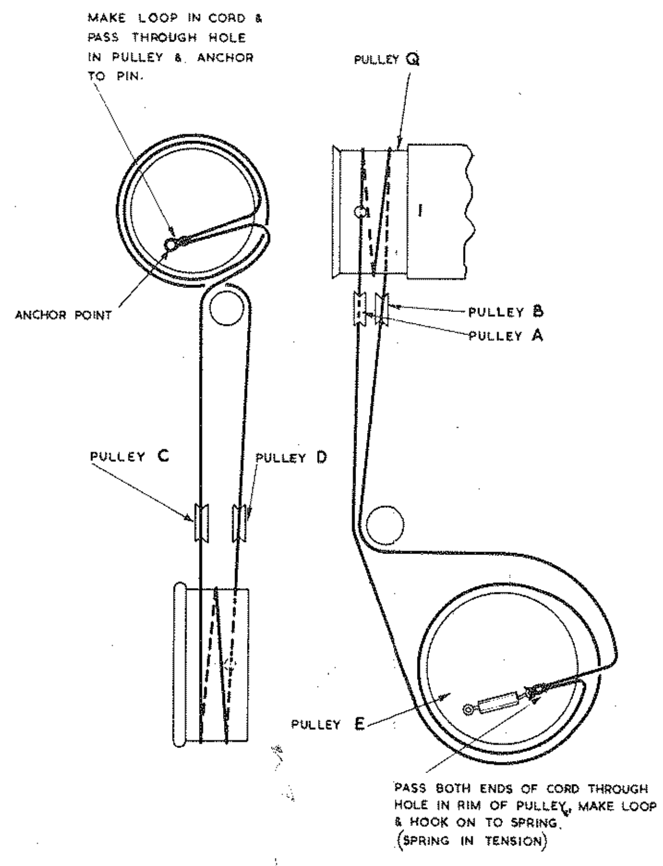


FIG. 1.

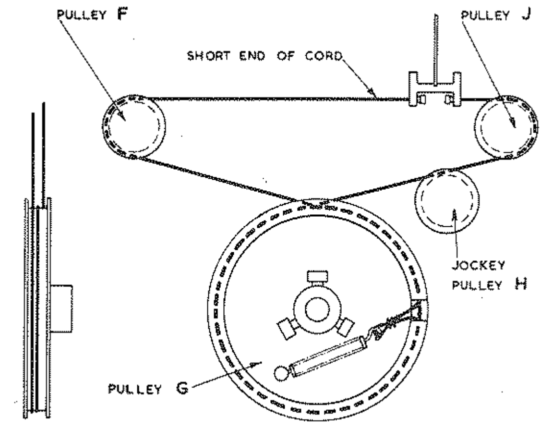


FIG. 2.

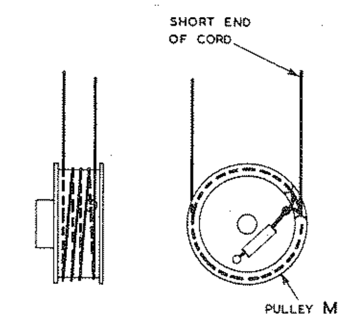


FIG 3

Issue No. 1
Sheet No. 1

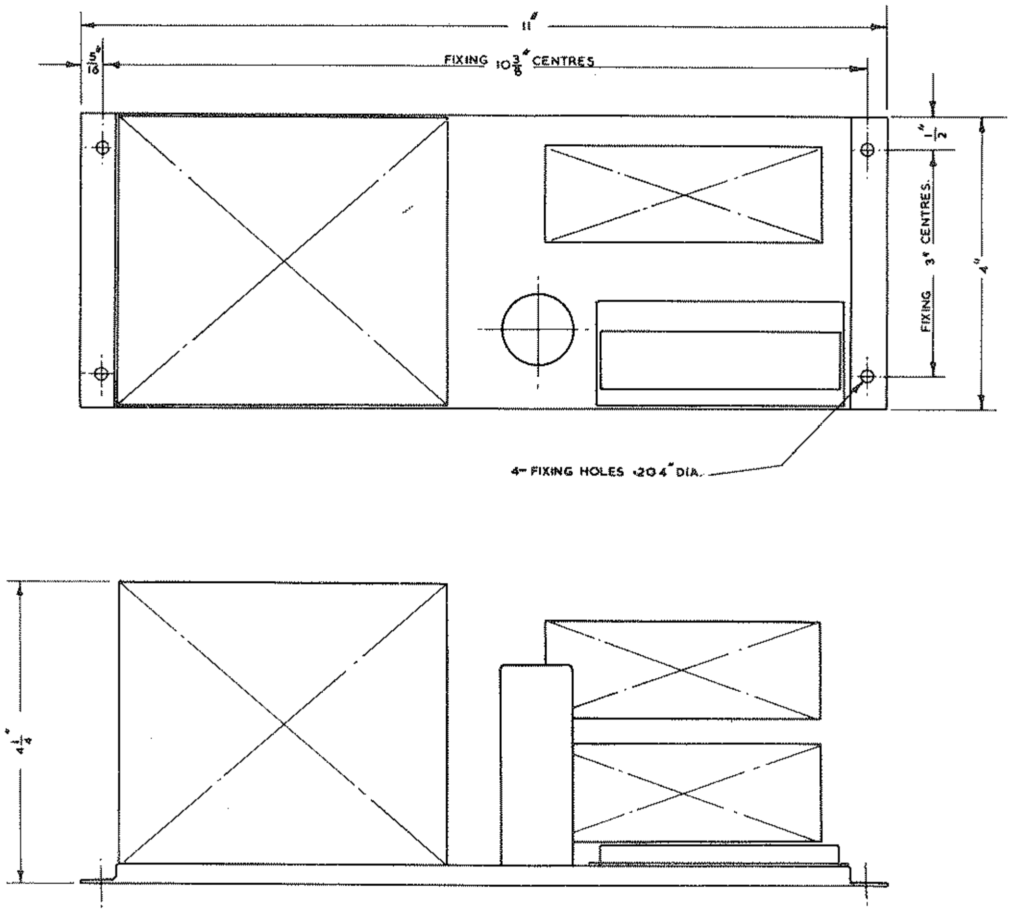
WZ.14128 D

DRIVE CORD REPLACEMENT DIAGRAMS "ATALANTA" RECEIVER TYPE 2207C

Issue No. 2
Sheet No. 1

OUTLINE SUPPLY UNIT TYPE 2202A

WZ.14362/B

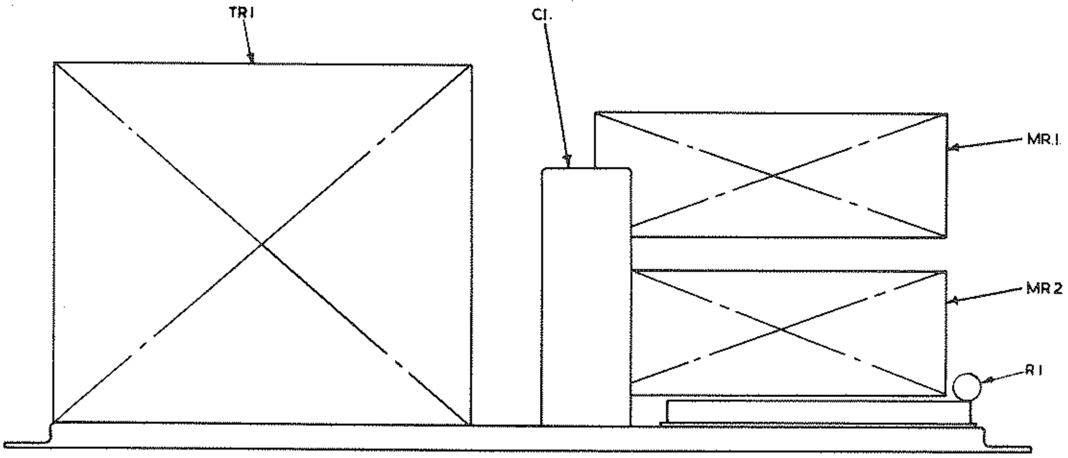


THE FOLLOWING ITEMS SUPPLIED FOR FIXING:

4–2BA CH. HD.X 1/4" LG. SCREWS

4–2BA SC. SPR WASHERS.

WEIGHT :– 7 LB



SIDE VIEW.

Issue No. 2
Sheet No. 1

WZ.14361/B

COMPONENT LOCATION SUPPLY UNIT TYPE 2202A

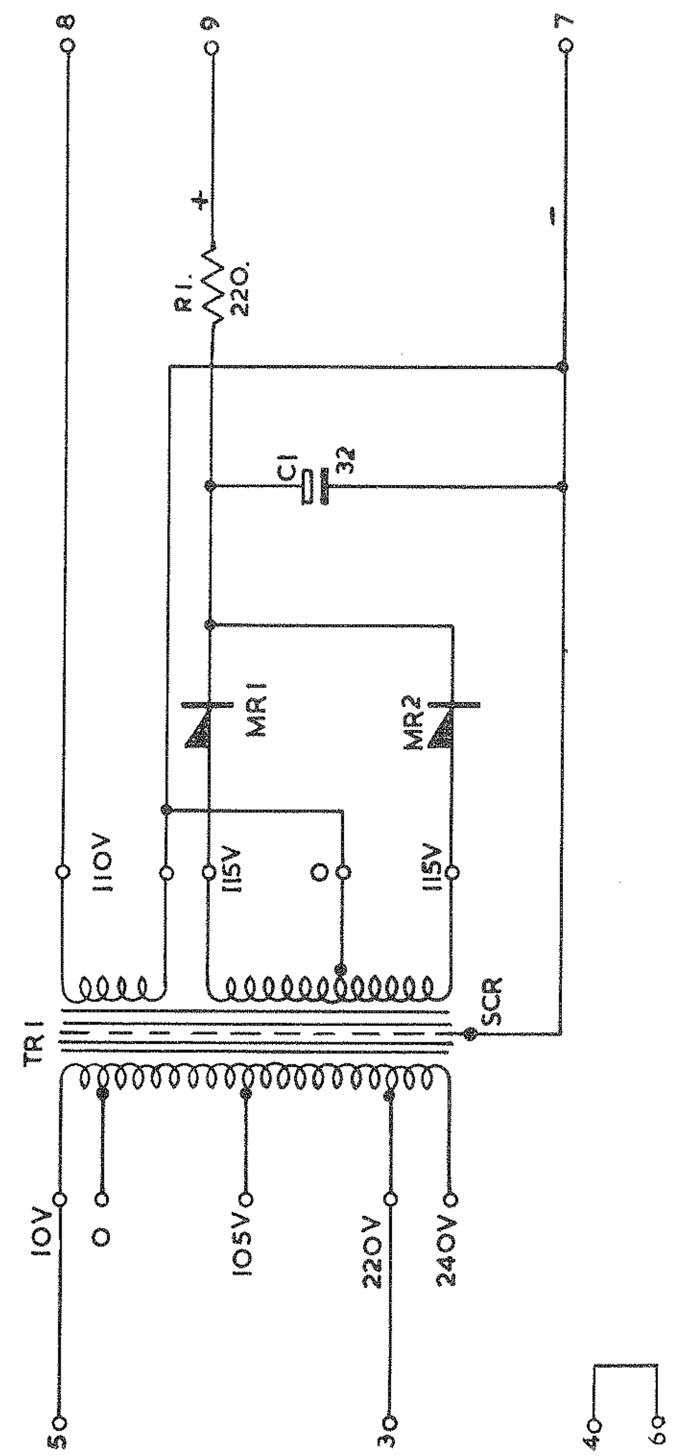
COMPONENT SCHEDULE

SUPPLY UNIT TYPE 2202A

Reference numbers in Col. 1 correspond to those on circuit diagram WZ.14312/B Sheet 1 and component location WZ.14361/B Sheet 1.

When ordering replacements quote description, value and standard identity.

CCT. Ref.	Description	Value	Standard Identity	Remarks
	CAPACITORS			
C1	Electrolytic	32μF. 450V. Wkg.	WIS.5753/C Sh. 1, Ref. 5A	NSA 397
	RESISTORS			
R1	W/W, Vit. Enam.	220 Ω 5% 3W.	PC.67008/9	
	MISCELLANEOUS ELECTRICAL ITEMS			
MR1	Rectifier		WIS.6436/C Sh. 1, Ref. 1	SenTerCel Type RM4
MR2	Rectifier		WIS.6436/C Sh. 1, Ref. 1	SenTerCel Type RM4
TR1	Transformer		WIS.5697/C Sh. 66	



Issue No. 3
Sheet No. 1

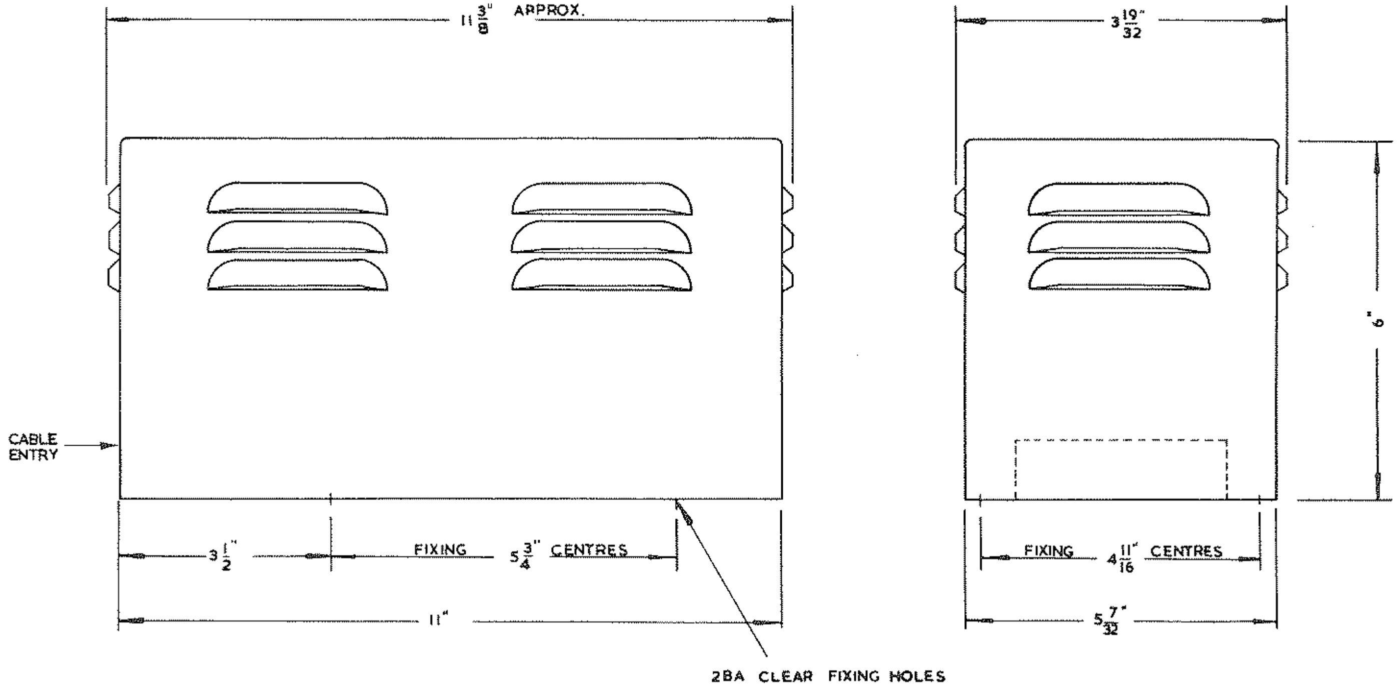
WZ.14312/B

CIRCUIT DIAGRAM SUPPLY UNIT TYPE 2202A

Issue No. 1
Sheet No. 1

OUTLINE SUPPLY UNIT TYPE 2203A

WZ.14365/B



THE FOLLOWING ITEMS ARE SUPPLIED FOR FIXING.

4 – 2BA CH HD SCREW X $\frac{3}{4}$" LG.

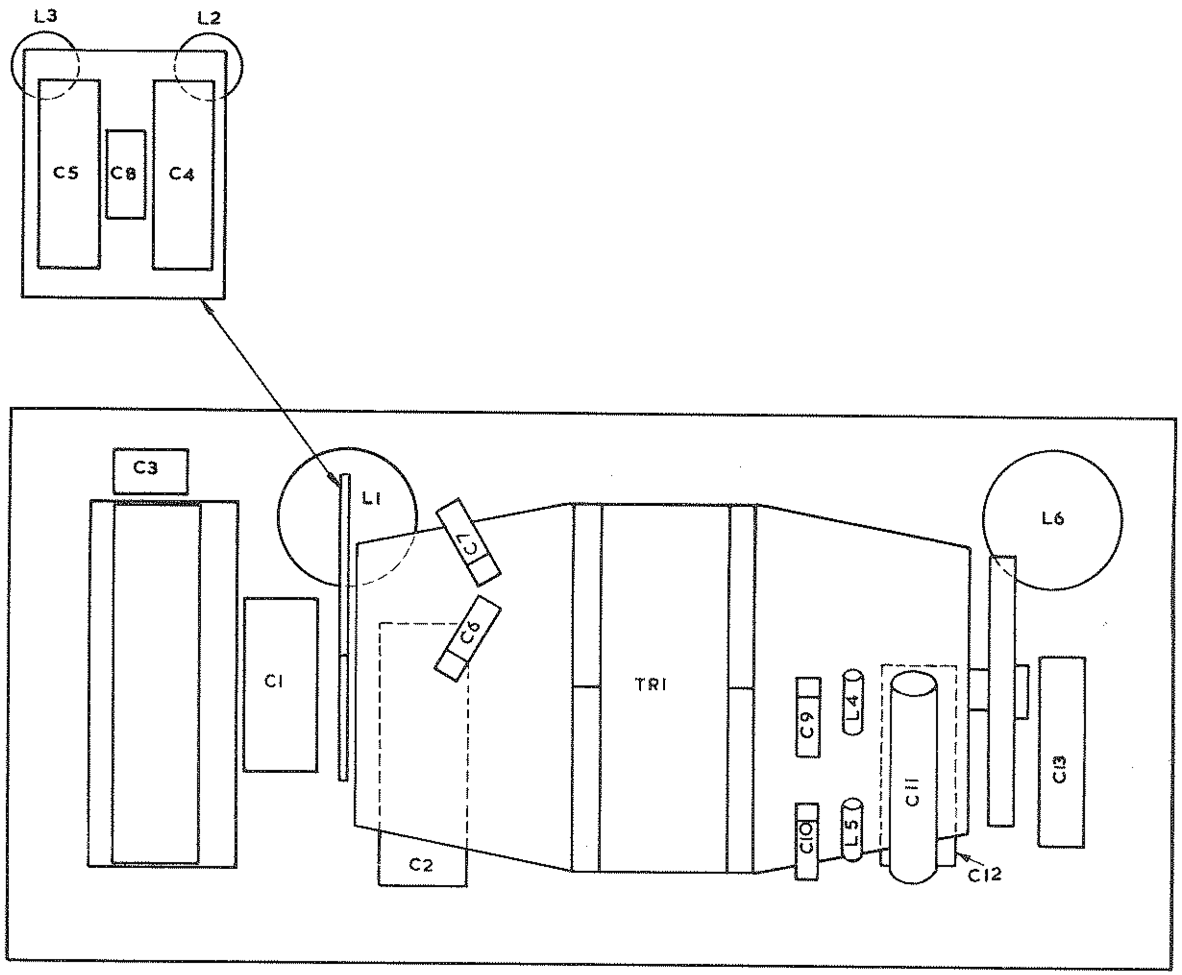
4 – 2BA SC SPR WASHER S.

WEIGHT :

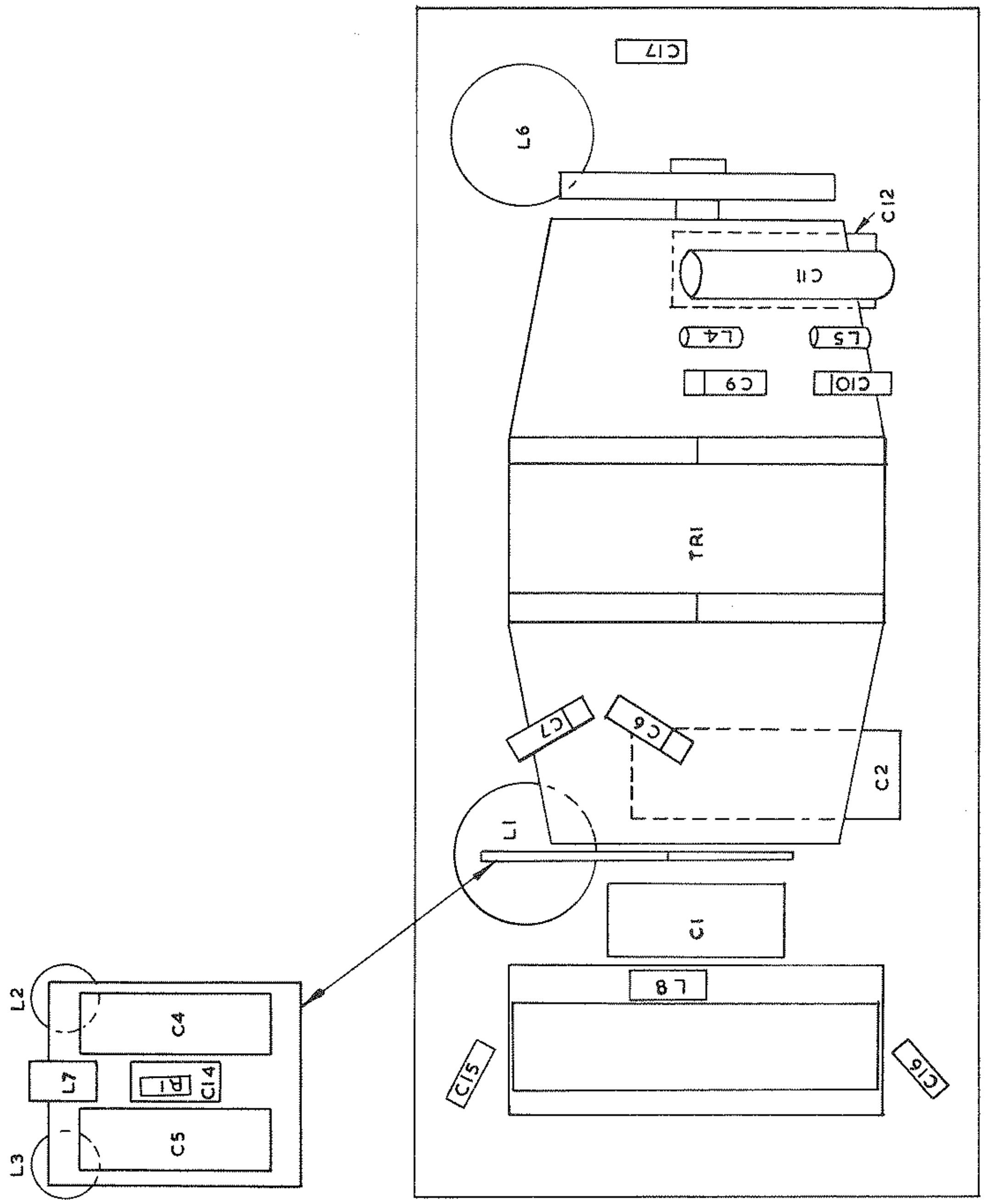
Issue No. 1
Sheet No. 1

COMPONENT LOCATION SUPPLY UNIT TYPE 2203A

WZ.14364/B



PLAN VIEW WITH COVER REMOVED



Issue No. 1
Sheet No. 2

WZ.14364/B

COMPONENT LOCATION SUPPLY UNIT TYPE 2203A
(IMPROVED SUPP. N.) SERIAL No. 200 APP. & ON.

COMPONENT SCHEDULE

SUPPLY UNIT TYPE 2203A

Reference numbers in Col. 1 correspond to those on circuit diagram WZ.14363/B Sheets 1 and 2 and component location WZ.14364/B Sheets 1 and 2.

When ordering replacements quote description, value and standard identity.

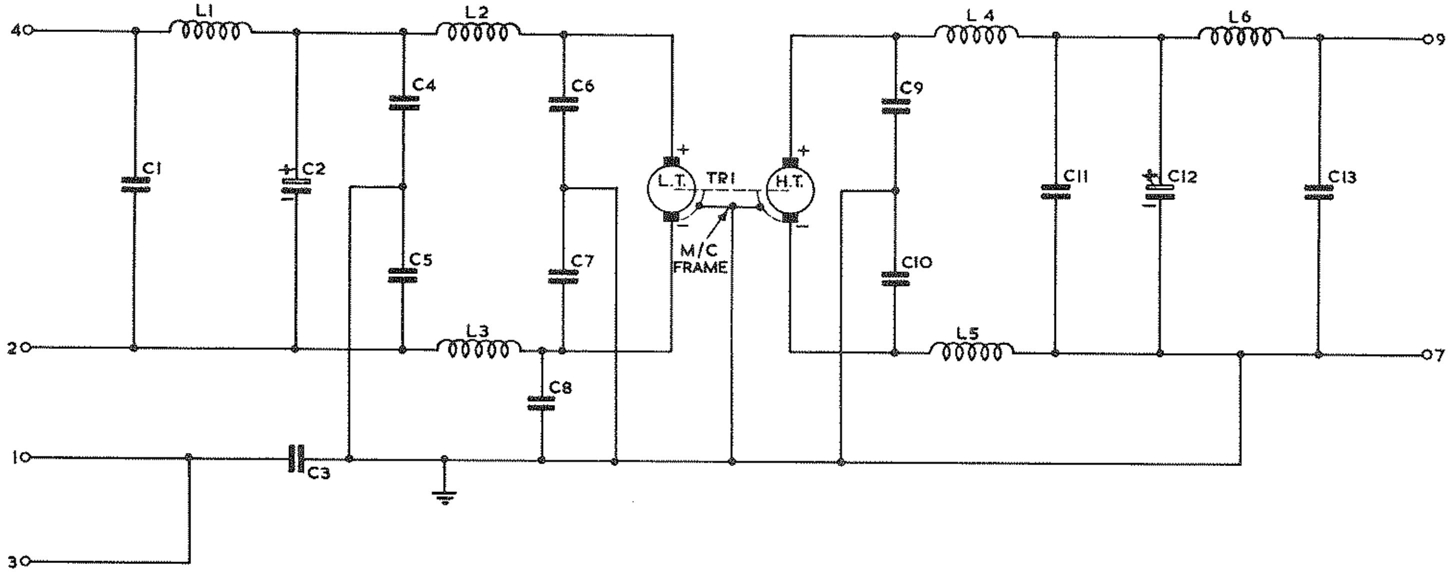
CCT. Ref.	Description	Value	Standard Identity	Remarks
	CAPACITORS			
C1	Paper, Tubular, Insulated	1·0μF.±25% 150V. D.C.	PC.19301/4	
C2	Electrolytic, Tubular, Insulated	25μF.+100% −20% 50V.	PC.18402/12	
C3	Mica, Moulded	1000μμF.±20% 350V. D.C.	PC.18701/2	
C4	Paper, Tubular, Insulated	·1μF.±20% 350V. D.C.	PC.19202/14	
C5	Paper, Tubular, Insulated	·1μF.±20% 350V. D.C.	PC.19202/14	
C6	Mica, Moulded	1000μμF.±20% 350V. D.C.	PC.18701/2	
C7	Mica, Moulded	1000μμF.±20% 350V. D.C.	PC.18701/2	
C8	Mica, Moulded	0·01μF.±20% 350V. D.C.	PC.18701/5	
C9	Mica, Moulded	1000μμF.±20% 350V. D.C.	PC.18701/2	
C10	Mica, Moulded	1000μμF.±20% 350V. D.C.	PC.18701/2	
C11	Paper, Tubular, Insulated	0·1μF.±20% 200V. D.C.	PC.19201/8	
C12	Electrolytic, Tubular. Insulated	4μF.+100% −20% 150V. D.C.	PC.18402/7	
C13	Paper, Tubular, Insulated	0·1μF.±20% 200V. D.C.	PC.19201/8	
C14	Paper, Tubular, Insulated	0·1μF.±25% 150V. D.C.	PC.19301/1	
C15	Ceramic, Tubular, Non-Insul.	0·01μF.±20%	WIS.4739/B Sh. 1, Ref. 14	
C16	Ceramic, Tubular, Non-Insul.	0·01μF.±20%	WIS.4739/B Sh. 1, Ref. 14	
C17	Ceramic, Tubular, Non-Insul.	0·01μF.±20%	WIS.4739/B Sh. 1, Ref. 14	
	RESISTORS FIXED			
R1	Comp. Grade 2, Insul.	22Ω±10% ¼W.	PC.66610/5	

CCT. Ref.	Description	Value	Standard Identity	Remarks
	INDUCTORS			
L1	RF Filter Choke		W.52988/C Sh. 1, Edn. A	
L2	RF Filter Choke		W.52989/C Sh. 1, Edn. A	
L3	RF Filter Choke		W.52989/C Sh. 1, Edn. A	
L4	Choke Suppression	1A	WIS.6224/C Sh. 1, Ref. 1	
L5	Choke Suppression	1A	WIS.6224/C Sh. 1, Ref. 1	
L6	RF Filter Choke	2·25mH$\pm$10%	W.25913/C Sh. 1, Edn. C	
L7	RF Filter Choke		W.52989/C Sh. 1, Edn. A	
L8	RF Filter Choke		W.52989/C Sh. 1, Edn. A	
	MISCELLANEOUS ELECTRICAL ITEMS			
TR1	Transformer Rotary		WIS.5712/B Sh. 2, Ref. 3	
	LT Brush & Flex		WIS.5712/B Sh. 2, Ref. 4	
	HT Brush & Spring		WIS.5712/B Sh. 2, Ref. 5	

Issue No. 2
Sheet No. 1

CIRCUIT DIAGRAM SUPPLY UNIT TYPE 2203A

WZ.14363/B

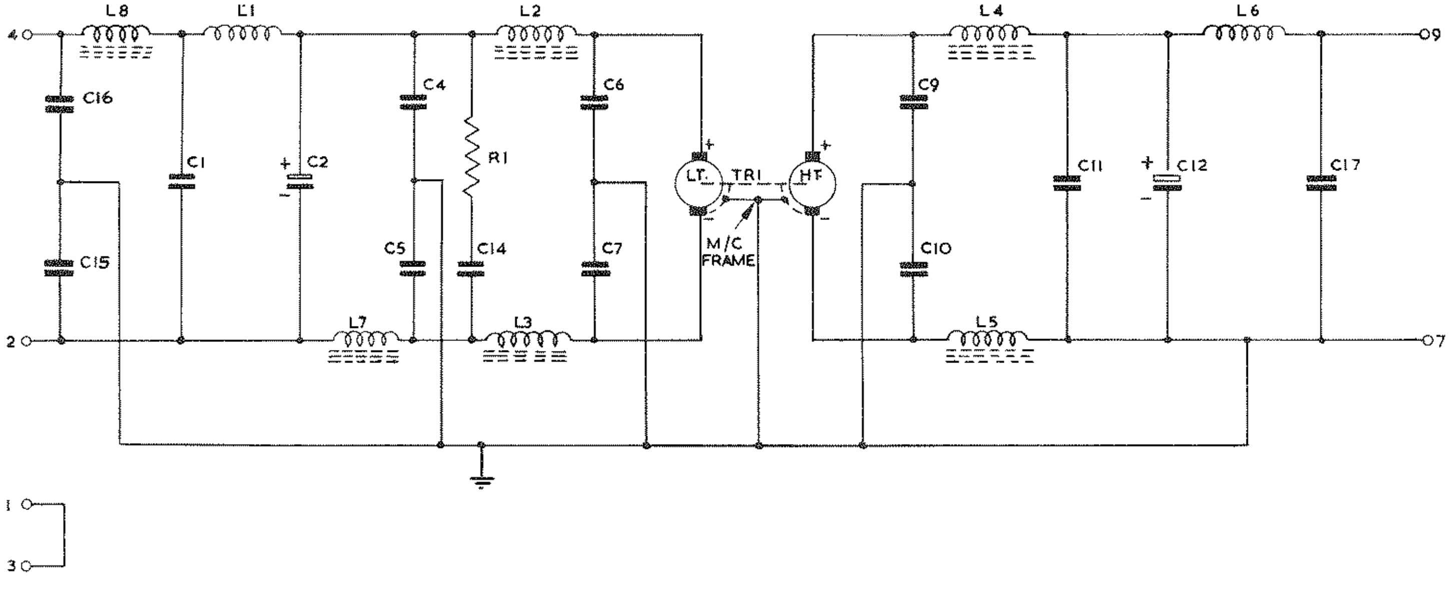


NOTE:
TERMINALS 5,6 AND 8 ON TERMINAL BLOCK NOT USED.

Issue No. 1
Sheet No. 2

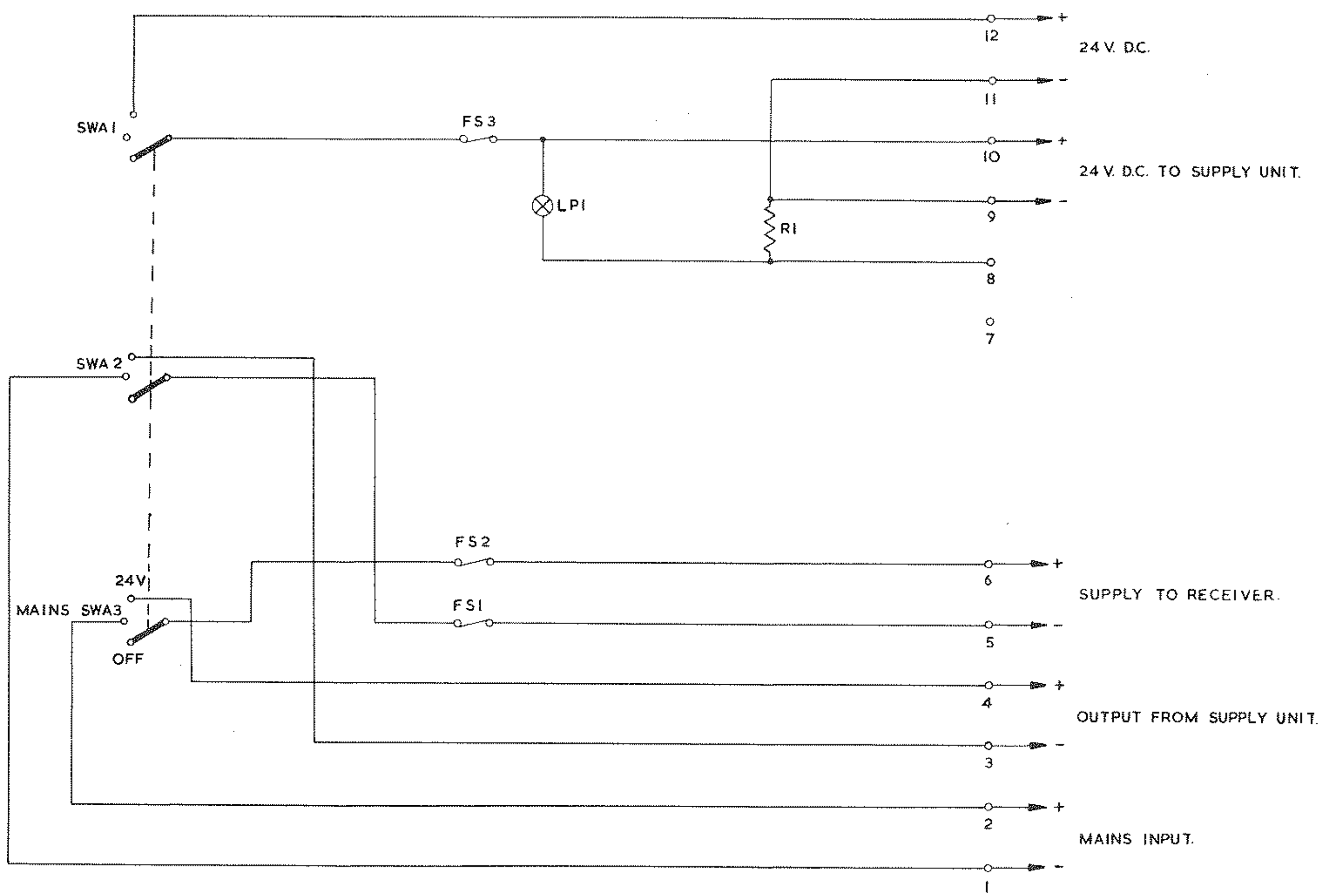
CIRCUIT DIAGRAM SUPPLY UNIT TYPE 2203A
(IMPROVED SUPP. N.) SERIAL No. 200 APP. & ON.

WZ.14363/B



NOTE
TERMINALS 5, 6 & 8 ON TERMINAL BLOCK NOT USED.

Issue No. 1
Sheet No. 1



CIRCUIT DIAGRAM
SWITCHING UNIT TYPE 2432A

WZ.16914/B

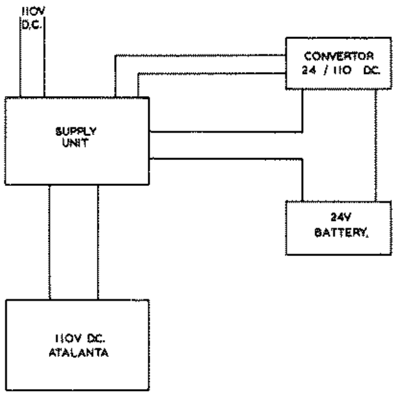


FIG. 1.

D.C. MAINS / BATTERY SUPPLIES
110V MAINS OR 110V CONVERTOR.

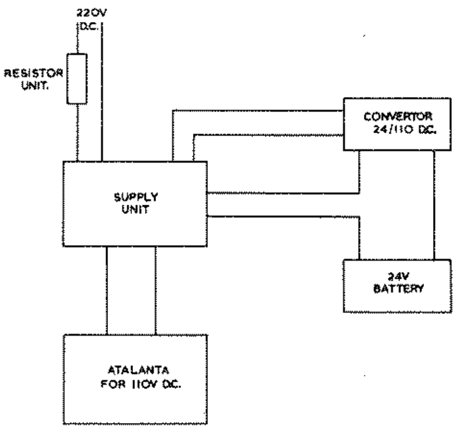


FIG. 2.

D.C. MAINS / BATTERY SUPPLIES
220V MAINS OR 110V CONVERTOR.

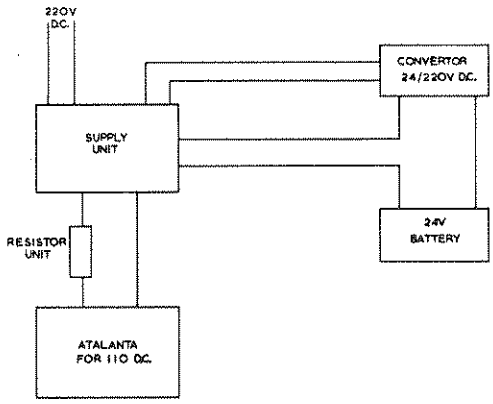


FIG. 3.

D.C. MAINS / BATTERY SUPPLIES
220V MAINS OR 220V CONVERTOR.

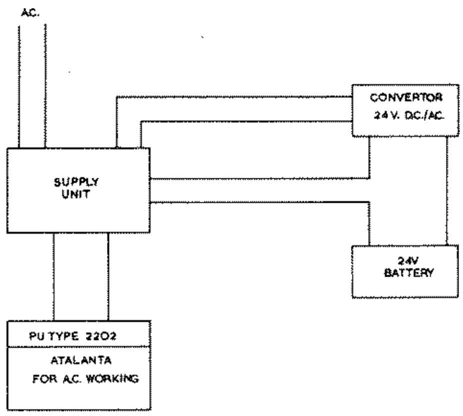


FIG. 4.

A.C. MAINS / BATTERY SUPPLIES
230 OR 115 AC. & CONVERTOR OF SIMILAR VOLTAGE.

WIRING CONNECTIONS SWITCHING UNIT TYPE 2432A

FIRST AID IN CASE OF ELECTRIC SHOCK

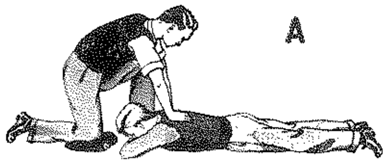
1 **PROTECT YOURSELF** with dry insulating material : DON'T TOUCH VICTIM WITH YOUR *BARE* HANDS until the circuit is broken.

2 BREAK THE CIRCUIT by opening the power switch and release the victim.

HOLGER NIELSEN METHOD OF ARTIFICIAL RESPIRATION

3 LAY PATIENT FACE DOWNWARDS with the forehead resting on the hands, placed one above the other.

4 REMOVE FALSE TEETH, TOBACCO, or GUM, from patient's mouth; make sure the TONGUE IS FREE by firm blows between the shoulders with the flat of the hand.



A

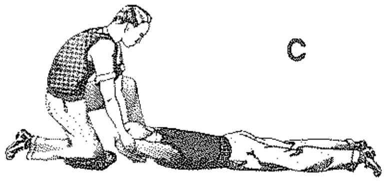
5 KNEEL, ON ONE KNEE AT PATIENT'S HEAD, one foot by the patient's elbow.

6 PLACE PALMS OF YOUR HANDS ON PATIENT'S SHOULDER BLADES SEE (A)

B

7 ROCK FORWARD UNTIL ARMS ARE VERTICAL the pressure should be light and without force (22—30 lbs.) is sufficient; this should take 2½ seconds. SEE (B).

8 RELEASE THE PRESSURE by allowing the hands to slide down the arms to the patient's elbow (approx. 1 second) then raise the patient's arms and shoulders slightly pulling at the same time by swinging backwards (approx. 2½ seconds) SEE (C) lower the patient's arms SEE (D) and return your hands to the patient's shoulder blades.

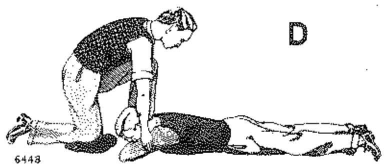


C

9 REPEAT THE MOVEMENTS taking 7 seconds for each complete respiration.

10 WHILE ARTIFICIAL RESPIRATION IS CONTINUED, HAVE SOMEONE ELSE

(*a*) Loosen patient's clothing,
(*b*) Send for doctor,
(*c*) Keep patient warm.



D

11 IF PATIENT STOPS BREATHING, CONTINUE ARTIFICIAL RESPIRATION. FOUR hours or more may be required.

12 DO NOT GIVE LIQUIDS UNTIL PATIENT IS CONSCIOUS.

TREATMENT FOR BURNS

13 If as a result of electric shock the patient is suffering from burns, the following treatment should be given without hindrance to artificial respiration.

(*a*) Remove clothing locally to enable the burn to be treated, but do not break blisters.

(*b*) Saturate burns with warm solution of one desertspoonful of bi-carbonate of soda to a pint of warm water, or one teaspoonful of salt to a pint of warm water.

(*c*) Cover with lint soaked in a similar solution and bandage (lightly if blisters have formed).

(*d*) If the above solutions are not available, cover with a sterile dressing.

(*e*) Warm, weak, sweet tea may be given when the patient is able to swallow.

The instructions printed above are approved by the Royal Life Saving Society who are of the opinion that the Holger Nielsen Method of Artificial Respiration is much more effective than the Schafer Method described overleaf, or the Silvester Method.

Further details of charts and book on Artificial Respiration can be obtained from the Royal Life Saving Society, 14, Devonshire Street, London, W.1.

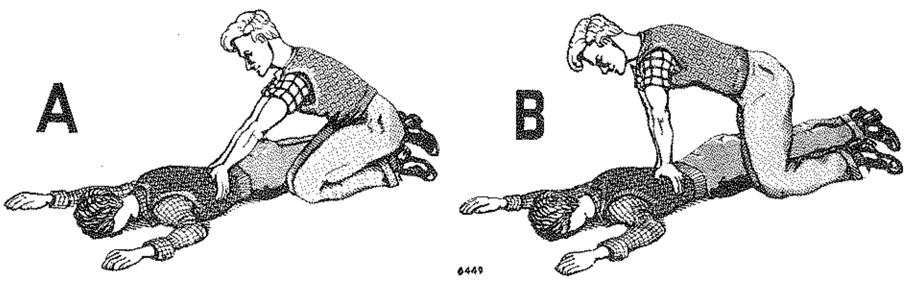
FIRST AID IN CASE OF ELECTRIC SHOCK

1 PROTECT YOURSELF with dry insulating material.

2 DON'T TOUCH VICTIM WITH YOUR *BARE* HANDS until the circuit is broken.

3 BREAK THE CIRCUIT by opening the power switch and release the victim.

SCHAFER METHOD OF ARTIFICIAL RESPIRATION



4 LAY PATIENT FACE DOWNWARDS, arms extended sideways and bent at elbows. Turn face outward.

5 REMOVE FALSE TEETH, TOBACCO, OR GUM from patient's mouth.

6 KNEEL ON ONE SIDE OF PATIENT'S THIGHS FACING HIS HEAD, WITH KNEES AND HIPS BENT. See (A).

7 PLACE PALMS OF YOUR HANDS ON PATIENT'S. BACK with little fingers just touching the lowest ribs.

8 WITH ARMS STRAIGHT, SWING FORWARD gradually bringing the weight of your body to bear upon the patient (approx. 2 seconds). See (B).

9 SWING BACKWARD SLOWLY to relieve the pressure (approx. 3 seconds).

10 REPEAT TWELVE TIMES PER MINUTE taking 5 seconds for every complete double movement.

11 WHILE ARTIFICIAL RESPIRATION IS CONTINUED, HAVE SOMEONE ELSE

(*a*) Loosen patient's clothing,

(*b*) Send for doctor,

(*c*) Keep patient warm.

12 IF PATIENT STOPS BREATHING, CONTINUE ARTIFICIAL RESPIRATION. FOUR hours or more may be required.

13 DO NOT GIVE LIQUIDS UNTIL PATIENT IS CONSCIOUS.

ADDITIONS AND CORRECTIONS.