

Instruction Manual  
for  
MARCONI 'MERCURY'  
(Type 1017)  
and  
MARCONI 'ELECTRA'  
(Type 1018)  
MARINE RECEIVERS

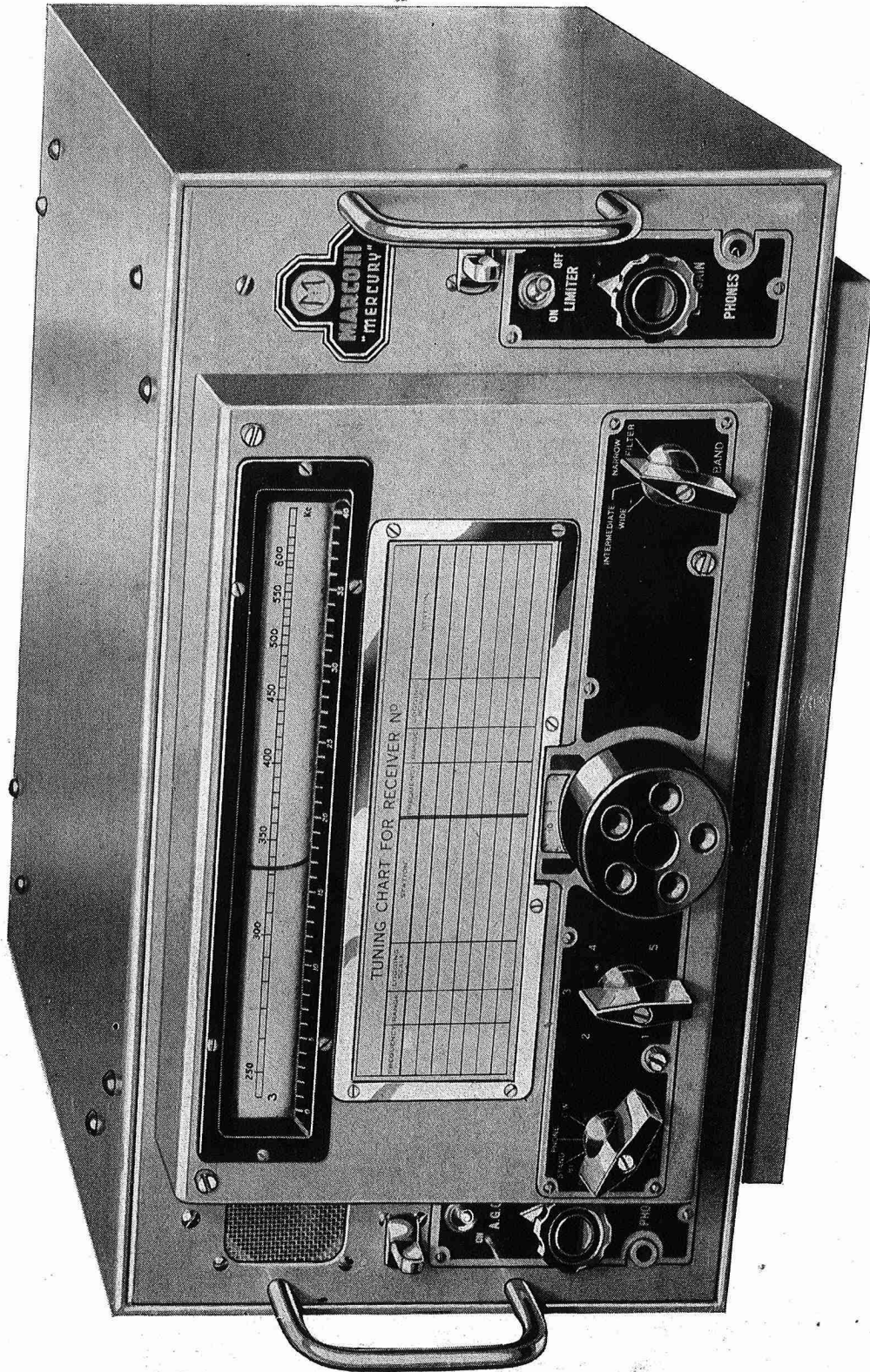
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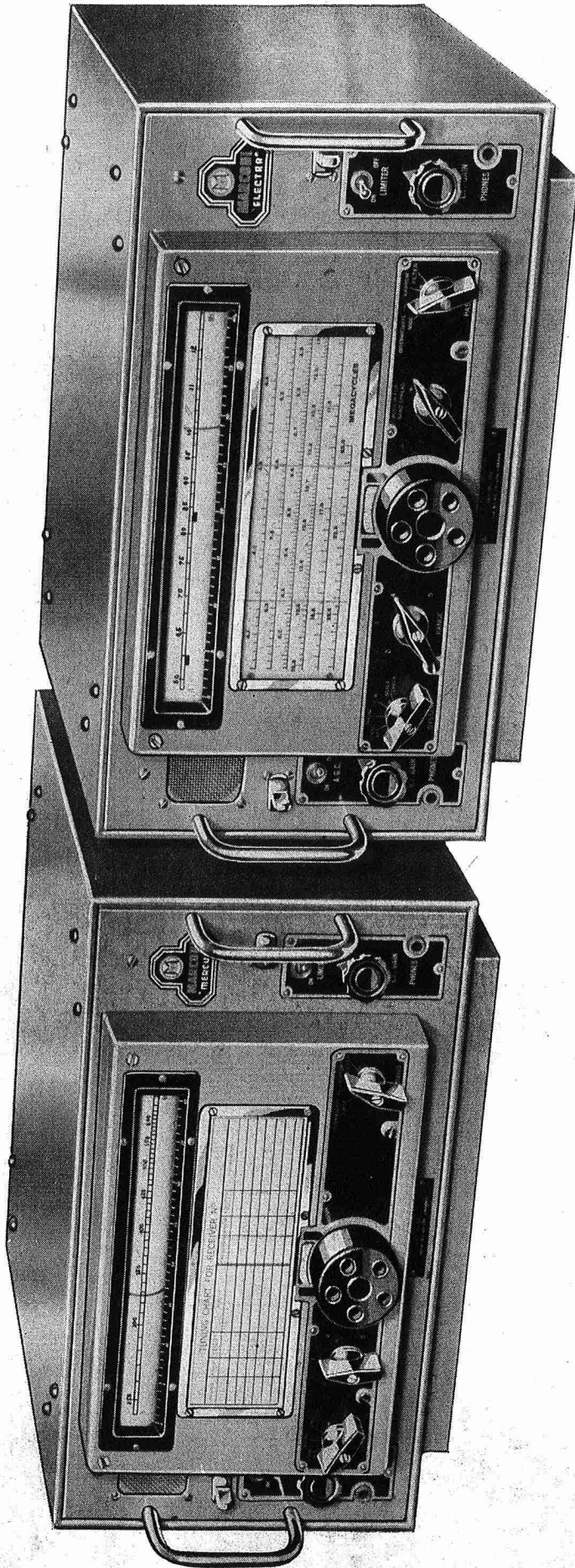
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MARCONI 'MERCURY' (Type 1017) MARINE MEDIUM AND LONG WAVE RECEIVER



MARCONI 'MERCURY' AND 'ELECTRA' MARINE RECEIVERS



COMBINED FITTING OF MARCONI 'MERCURY' AND 'ELECTRA'  
MARINE RECEIVERS

# Instruction Manual

## for

# RECEIVERS 'MERCURY' (Type 1017)

# & 'ELECTRA' (Type 1018)

### SUMMARY

This Instruction Manual covers the technical information for the Marine General Purpose Receivers, 'Mercury' and 'Electra', Type 1017 and 1018 respectively.

An attempt has been made to present the information for both types of receiver in a common framework, using parallel vertical columns where the descriptive text differs appreciably for each type. This has been facilitated by the fact that these two receivers, although differing radically in circuit design, have been planned to use almost identical mechanical design features.

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DESCRIPTION  
AND  
OPERATING INSTRUCTIONS  
FOR  
RECEIVERS 'MERCURY' (TYPE 1017) and 'ELECTRA' (TYPE 1018)

SECTION I

INTRODUCTION

These receivers have been designed primarily to meet the 'Performance Specification for General Purpose Receivers for Merchant Ships' as laid down by the General Post Office.

The two receivers together cover the frequencies from 15 kc/s to 25 Mc/s. Each receiver has five ranges and on the 'Mercury', type 1017, the frequencies of these ranges are: —15 to 40 kc/s, 100 to 250 kc/s, 250 to 640 kc/s, 640 to 1,600 kc/s and 1,600 to 4,000 kc/s. On the 'Electra' type 1018, the frequencies of these ranges are: —250 to 520 kc/s, 1.5 to 3.0 Mc/s, 3.0 to 6.0 Mc/s, 6.0 to 12.0 Mc/s and 12.0 to 25 Mc/s.

Both receivers are designed to work from an 889A power unit which will operate off 24, 110 and 220 volts D.C. and 230 volts A.C. The type 889 power unit may also be used with both these receivers.

Special features of both receivers include the following:—A high degree of electrical and thermal stability is ensured by the provision of a voltage stabiliser and a temperature compensator. A high-discrimination log scale is fitted to each receiver to supplement the normal frequency calibration. The receiver type 1018 also includes a set of bandspread scales to expand each of the six H.F. shipping bands; when used in conjunction with the built-in crystal calibrator these scales permit the accurate pretuning of a hitherto unlogged station, knowing only the frequency of the latter.

Four degrees of selectivity are provided with bandwidths ranging from 8 kc/s to 150 c.p.s. Other circuit refinements include an automatically controlled pulse limiter.

Protection is afforded against possible damage of the receiver circuits from an associated transmitter by the inclusion of high speed relays which can be operated by the back contacts of the transmitter key.



SECTION 2  
DATA SUMMARY

2.1. Frequency Range

'Mercury' (Type 1017):—15 kc/s-40 kc/s and 100 kc/s-4.0 Mc/s; the latter in four ranges.

'Electra' (Type 1018):—250 kc/s-520 kc/s and 1.5 Mc/s-25.0 Mc/s; the latter in four ranges.

2.2. Supply Requirements

Both receivers operate from an 889A or 996A supply unit. The input voltage to these can be 24, 110 or 220 volts D.C. or 230 volts A.C. The approximate consumption is 65 watts.

2.3. Receiver Input

These receivers are designed to give the best performance with the following inputs:—

- (a) Below 4.0 Mc/s—an aerial whose capacity including feeder is not greater than 600  $\mu\mu\text{f}$ .
- (b) Above 4.0 Mc/s—an input impedance of 75 ohms.

2.4. Receiver Output

- (a) Small built-in speaker handling up to 30 mW.
- (b) Two 'phone jacks' on front panel for low impedance 'phones handling up to 10 mW.
- (c) Additional 'phones available at terminals on the case near the power socket.
- (d) Extension 'phones available on tag 5 of power socket on the case.

2.5. Valves

	Valve Type	Number required	
		'Mercury' Type 1017	'Electra' Type 1018
657	KTW61	4	5
	X61M	3	2
* 6J5	L63	1	2
6Q7	DH63	1	1
646	D63M	2	2
0D3	VR150/30	1	1

2.6. Dimensions and Weight

Width—17 $\frac{3}{4}$ "; depth—15 $\frac{1}{2}$ "; height—10".

Receiver weight—55 lbs.

Supply unit weight—21 lbs.

## SECTION 3 DESCRIPTION

### 3.1. GENERAL DESCRIPTION

The receivers are of all steel construction and suitable for bench mounting. One receiver may also be mounted on top of the other. The panel and chassis may be withdrawn from the case by releasing the two slide fasteners, mounted on the panel. The supply unit is a separate unit and is described fully in the Appendix on page 83.

A seven-way socket is fitted to the case to carry the receiver supplies and also the extra 'phone and desensitising lines. Mounted beside this socket is a pair of additional 'phone terminals and an earthing bolt. A diagram showing the disposition of controls and other points mentioned is given on page 11.

The chassis is of the tray type with open sides. A narrow web divides the signal frequency portion from the smaller intermediate frequency portion. The majority of minor components are fitted to tagboards which make most components and wire junctions readily accessible.

Feed metering points are provided on a tag board which is accessible through one of the open sides in the chassis tray. Each metering point is clearly labelled on the feed metering board.

All circuit trimmers can be adjusted while the receiver is in the upright position. A dust cover protects the signal frequency trimmers.

The majority of the drive components associated with the main tuning (and in the case of the Type 1018 receiver the bandsread drive) together with the mechanisms operating the scale pointer and calibration drum are fitted in front of the panel in order to facilitate replacement. The whole of these cords and gears are protected by an easily removable cover.

The five ranges are calibrated on a 10½ inch drum which rotates on a horizontal axis. This drum is rotated by the range switch to show the appropriate scale. The Type 1018 has also a flat bandsread scale fitted below this drum. This scale can be brought into use by means of a handle on the panel.

An 80 to 1 gear reduction is used for the main tuning drive all the time. Quick transit from one part of the scale to another is facilitated by the flywheel action of the knob.

A logging scale is provided. This consists of a calibrated disc mounted on the main tuning spindle used in conjunction with numbers engraved on the lower side of the calibration escutcheon plate.

### 3.2. TECHNICAL DESCRIPTION

For the complete circuit diagram of connections see pages  
The valve sequence for both receivers is as follows:—

	'Mercury' Type 1017	'Electra' Type 1018
1st S.F. Amplifier. V1 ... ..	KTW61	KTW61
2nd S.F. Amplifier. V2 ... ..	KTW61	KTW61
1st Frequency changer. V3 ... ..	X61M	X61M
1st Frequency changer oscillator. V4 <i>X</i> ... ..	—	L.63
2nd Frequency changer. V4 ... ..	X61M	—
1st I.F. Amplifier. V5 ... ..	KTW61	KTW61
2nd I.F. Amplifier. V6 ... ..	KTW61	KTW61
Final detector. V7 ... ..	D63M	D63M
Beat Frequency oscillator. V8 <i>X</i> ... ..	X61M	X61M
Noise Limiter. V9 ... ..	D63M <i>646</i>	D63M
1st L.F. Amplifier. V10 ... ..	DH63	DH63
L.F. Output Amplifier. V11 <i>X</i> ... ..	L63	L63
Calibrating oscillator. V12 <i>X</i> ... ..	—	KTW61
Voltage stabiliser. V13 <i>X</i> ... ..	VR150/30	VR150/30

A large part of the receivers follow the usual technique, but there are a number of points which require special mention.

### 3.2.1. Signal Frequency Circuits

Interposed between the first tuned circuits and the aerial are two desensitising relays, and various rejector circuits. The relays protect the first circuits from excessive transmitter voltages when used in conjunction with a transmitter and in order to do this, 24 volts must be applied to the relay coils while transmissions are in progress. One relay takes the aerial to earth via R1 and the other shorts the aerial coupling winding to earth and also reduces the gain of V1 and V5. The rejector circuits enable the inter-modulation requirement set out in the G.P.O. specification to be met. On the Type 1017 only an I.F. rejector at 4.5 Mc/s is used as well. The frequencies of the various ranges are as set out in columns 2a and 2b of the tables on page 6.

### 3.2.2. Frequency Changer Circuits

#### 'Mercury' (Type 1017)

On the above receiver two triode hexode frequency changers are used. The 1st frequency changer (V3) is used on all ranges. On ranges 1, 2 and 3 the output from this valve is fed direct into the 85 kc/s I.F. circuits and V4 is not used. On ranges 4 and 5 the output from V3 is fed into two pairs of circuits at 4.5 Mc/s and these are fed into V4, the 2nd frequency changer whose output is fed direct into the 85 kc/s I.F. circuits. These circuits are switched by means of switches S6 and S7.

#### 'Electra' (Type 1018)

On the Type 1018 receiver only one frequency changer is used. The oscillator consists of a separate triode V4 whose output is fed into the hexode part of V3 for mixing. The triode portion of V3 is not used.

A temperature compensator is fitted to the first oscillator of both receivers and this reduces the frequency drift due to temperature changes. A resistor R31, connected across the 24 volt heater line is mounted near the moving vane of the compensator so that heat from this resistor may accelerate the action of the bimetal vane of the compensator.

### 3.2.3. Intermediate Frequency Circuits

#### 'Mercury' (Type 1017)

In the type 1017 receiver two I.F. frequencies are used. The 85 kc/s I.F. is employed all the time and it is by these circuits that the various passbands are obtained. On ranges 4 and 5 a 4.5 Mc/s I.F. is employed in addition to the 85 kc/s. These two pairs of circuits do not affect the passband. On range 1 the I.F. gain is considerably reduced on 'Wide' and 'Intermediate' by reducing the inductive coupling between one of the coupled pairs of I.F. circuits. This is necessary in order to retain electrical stability.

#### 'Electra' (Type 1018)

On the type 1018 receiver a 690 kc/s I.F. is used throughout. To obtain the necessary passbands a twin crystal gate is used for the 'Narrow' pass band while orthodox L.C. circuits are used for the others.

Both receivers are fitted with three passband positions in addition to the 1,000 c.p.s. note filter. The passbands are changed by varying the inductive coupling of two of the coupled pairs of I.F. circuits. The total bandwidths for 6 db. attenuation are approximately 8 kc/s for 'Wide', 3 kc/s for 'Intermediate' and 1 kc/s for 'Narrow'. Gain equalisation for the various passband positions is brought about by adjusting the cathode bias of V6.

The final I.F. tuned circuit feeds into a double-diode valve. When the receiver is switched for C.W. reception 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 by means of the rear contacts on S15. (This balanced demodulator eliminates M.C.W. interference and interference produced by an adjacent unwanted carried beating with the wanted carrier.)

The B.F.O. valve V8 consists of a triode hexode, the triode portion containing the oscillator tuned circuit. The oscillation is coupled into the hexode portion electronically and the final output is taken from across R67. C159 is employed to attenuate the higher frequency harmonics. The B.F.O. is injected into the centre of the final I.F. tuned circuit. In addition to the advantages of balanced demodulation mentioned above this mode of injection minimises the possibility of the B.F.O. voltage being transferred back into the previous tuned circuit and so operating the A.G.C. system.

Following the final detector is a pulse noise limiter consisting of two diodes in series designed to suppress both positive and negative pulses. The noise limiter derives its controlling bias from the rectified output of one of the diodes of V10. The noise limiter may be switched out by means of S12 (on front panel).

The A.G.C. system used controls V2 and V5 fully and V1 and V6 partially. This can be switched 'Off' or 'On' from the switch S13 on the front panel. The A.G.C. diode is contained in V10. An H.F. gain control (R113), operating on V1 and V5 only, is also fitted.

### 3.2.4. Low Frequency Circuits

The L.F. circuits are of the usual type. A small 'speaker is fitted in addition to the usual 'phone jacks; the former will automatically operate when all 'phones are removed from the receiver.

### 3.2.5. Other Characteristics

Both receivers are fitted with a voltage stabilising valve V13 stabilising at 150 volts. This stabilised line is used to feed the H.T. to the frequency changer oscillator, the B.F.O. valve and the screen grid of the first I.F. valve V5. All the other H.T. voltages are taken from the main 230 volt H.T. line.

#### 'Mercury' (Type 1017)

On the 1017 receiver an L.F. filter choke L37 is included in the heater supply line. This is required primarily for range 1 when 24 volts D.C. is used on the heaters. This can be switched out by means of the A.C./D.C. link PB1, which also removes the electrolytic condensers from the heater line when on A.C. working.

#### 'Electra' (Type 1018)

On the 1018 receiver an A.C./D.C. link PB1 is provided and this removes the electrolytic condensers from the heater line on A.C. working.

This receiver is also fitted with a crystal calibrator unit working at 690 kc/s. With the system switch at 'Scale check' the harmonics of the 690 kc/s locate the main shipping channels while the fundamental replaces the B.F.O. The H.T. is removed from the anodes of V1 and V2 as well, thus removing any signals arriving from the aerial.

## 3.3. PERFORMANCE DATA

### 3.3.1. Sensitivity

In the table set out below the sensitivity for both receivers may be seen in column 4a and 4b.

#### 'Mercury' (Type 1017)

The sensitivity on the 'Mercury' receiver is given as the C.W. input via the appropriate dummy aerial (i.e. 200 pF. for all ranges) for a signal noise ratio of 10 db. The passband is set at 'Narrow'.

#### 'Electra' (Type 1018)

The sensitivity on the 'Electra' receiver is given as the C.W. input via the appropriate dummy aerial (i.e. 200 pF on ranges 1 and 2 and 75 ohms on all other ranges) for a signal/noise ratio of 20 db. The passband is set at 'Wide' for all ranges, except for range 1 where 'Intermediate' is used.

### 3.3.2. Image Protection

The amount by which the image signal is attenuated is shown in columns 5a and 5b in the tables following: —

'MERCURY' RECEIVER TYPE 1017

(1a) <i>Range</i>	(2a) <i>Frequency</i>	(4a) <i>Sensitivity</i>	(5a) <i>Image Protection</i>
1	15 kc/s	20.0 $\mu$ V	100 db.
	40 kc/s	3.5 $\mu$ V	90 db.
2	100 kc/s	3.5 $\mu$ V	110 db.
	250 kc/s	4.0 $\mu$ V	100 db.
3	245 kc/s	3.5 $\mu$ V	100 db.
	645 kc/s	2.0 $\mu$ V	85 db.
4	635 kc/s	2.0 $\mu$ V	120 db.
	1650 kc/s	1.0 $\mu$ V	120 db.
5	1550 kc/s	1.0 $\mu$ V	120 db.
	4000 kc/s	1.0 $\mu$ V	90 db.

'ELECTRA' RECEIVER TYPE 1018

(1b) <i>Range</i>	(2b) <i>Frequency</i>	(3b) <i>Dummy Aerial</i>	(4b) <i>Sensitivity</i>	(5b) <i>Image Protection</i>
1	250 kc/s	200 pF	15 $\mu$ V	100 db.
	500 kc/s	200 pF	15 $\mu$ V	100 db.
2	1.5 Mc/s	200 pF	2.0 $\mu$ V	100 db.
	3.0 Mc/s	200 pF	1.0 $\mu$ V	90 db.
3	3.0 Mc/s	75 ohms	1.5 $\mu$ V	100 db.
	6.0 Mc/s	75 ohms	1.3 $\mu$ V	80 db.
4	6.0 Mc/s	75 ohms	1.3 $\mu$ V	90 db.
	12.0 Mc/s	75 ohms	1.1 $\mu$ V	65 db.
5	12.0 Mc/s	75 ohms	2.0 $\mu$ V	70 db.
	25.0 Mc/s	75 ohms	1.0 $\mu$ V	35 db.

**3.3.3. Adjacent Channel Protection**

Protection on both receivers is as set out in the table below. Column A gives the total passband for 6 db. attenuation and column B gives the total passband for 40 db. attenuation.

Switch Position	'Mercury' Type 1017		'Electra' Type 1018	
	A	B	A	B
Filter ...	100-150 c.p.s.	—	100-150 c.p.s.	—
Narrow ...	1.5 kc/s	4.5 kc/s	1.2 kc/s	5.0 kc/s
Intermediate ...	3.7 kc/s	8.0 kc/s	3.3 kc/s	10.5 kc/s
Wide ...	9.0 kc/s	15.0 kc/s	9.3 kc/s	19.0 kc/s

**3.3.4. Fidelity**

On the 'Filter' position frequencies above 1,200 c.p.s. and below 800 c.p.s. are attenuated by at least 20 db. When the passband switch is set to the other passband positions the overall fidelity is influenced by the I.F. circuits. The I.F. response curves are given on page 8 and the L.F. response curves on page 9.

### 3.3.5. A.G.C. Characteristics

When the receiver is adjusted for a signal approximately 20 db above the levels quoted in the table of sensitivities (above), a subsequent increase in input of 60 db produces a rise of output of: —

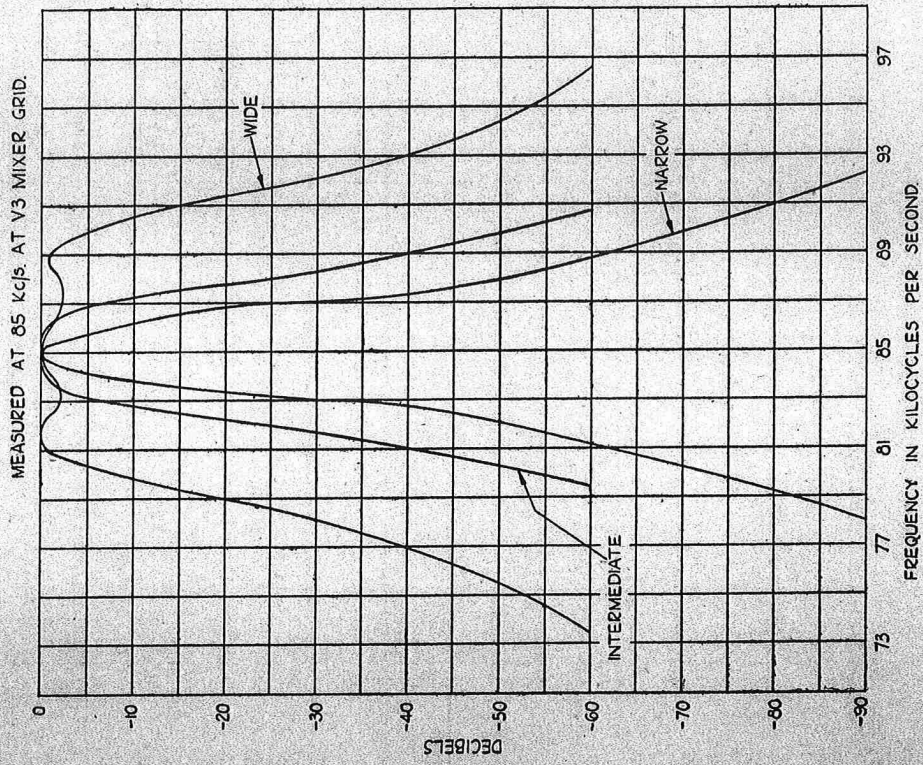
- not more than 10 db in the case of 'Mercury' (Type 1017)
- not more than 6 db in the case of 'Electra' (Type 1018)

### 3.3.6. Thermal Drift

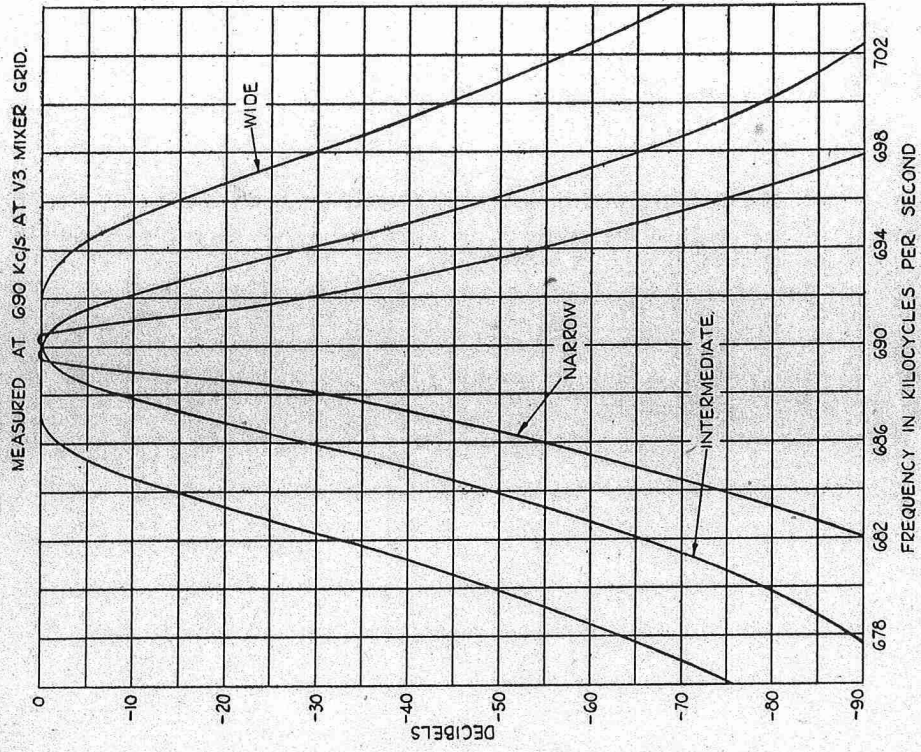
After allowing for a 5 minute warming up period the drift in any subsequent 5 minute period is not more than 3 parts in  $10^4$  for frequencies between 15 kc/s and 1,500 kc/s and not more than 1 part in  $10^4$  for frequencies between 1.5 Mc/s and 25.0 Mc/s.

### 3.3.7. Radiation

These receivers do not produce a field exceeding  $0.1\mu\text{V}$  per metre at a distance of one nautical mile as laid down in the G.P.O. specification.



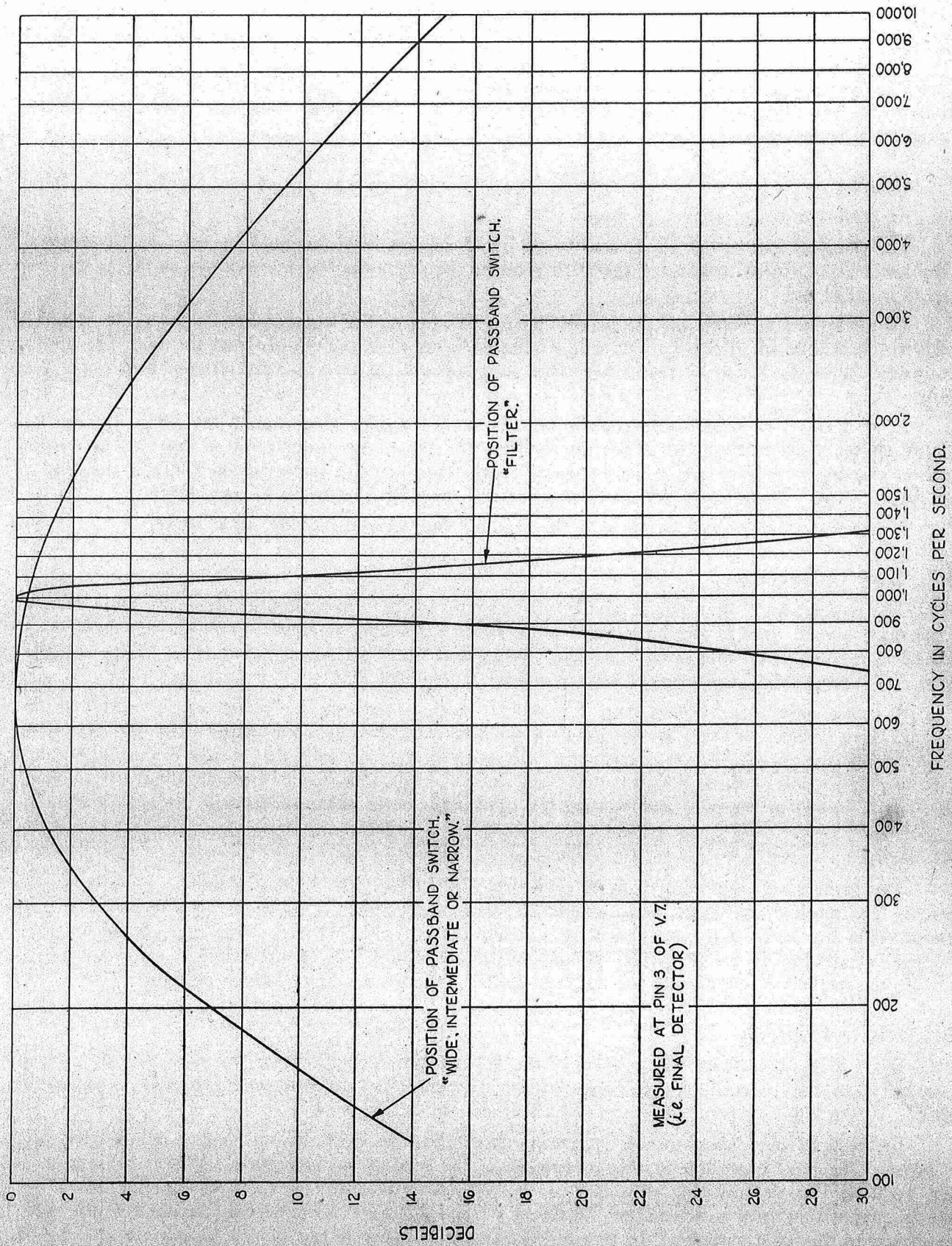
I.F. RESPONSE CURVES FOR TYPE 1017 RECEIVER.



I.F. RESPONSE CURVES FOR TYPE 1018 RECEIVER.

I. F. RESPONSE CURVES

W.Z. 4259



W.Z.4260

L.F. RESPONSE CURVES FOR TYPE 1017 & 1018 RECEIVERS



## SECTION 4 INSTALLATION

### 4.1. Unpacking

The valves and crystals for this equipment are packed separately. The correct position of the various valves and crystals can be seen from the lettering on the chassis. Top cap valve leads should be connected to their correct valves.

### 4.2. Mounting

An outline drawing is given on page 11.

The receivers may either be screwed to the bench separately or mounted one on top of the other. If the latter arrangement is adopted the 1018 receiver should be the lower of the two as this is the one in more frequent use.

To mount the receivers on the bench first of all remove the hexagon-head screws securing the plinth to the bottom of the case. This will require the removal of the chassis from the case. The plinth is now screwed to the bench by the wood screws supplied and the receiver case screwed back on to the plinth.

If one receiver is to be mounted on top of the other receiver then mount the lower receiver as detailed above. Next remove the 2 BA screws from the top of the lower receiver case and screw the plinth of the upper receiver (which has previously been removed from the upper receiver), to the case of the lower receiver. The case of the upper receiver may now be screwed to its own plinth.

A direct earth must also be made to the earthing bolt near the power input socket.

### 4.3. Supply Connections

The power supply unit should first of all be set up to the correct supply voltage available. Details of the necessary changes to the power unit are given in the section on power supply starting on page 83. Similarly the A.C./D.C. plug switch on the chassis near the 5 pin power input socket must always be set to A.C. except when the primary supply voltage is 24 volts D.C.

A 7-core connector (such as type 795) can be used to connect the power supply unit and the receiver. This lead is the same as that used for the CR 300; the pin connections used are similar to the latter but the method of desensitising is different (see below). Note that this lead may come away from its plug in one of three different directions (see page 11). This may be brought about by removing three C/SK screws in the plug and rotating the right angle cover of the plug to the desired position.

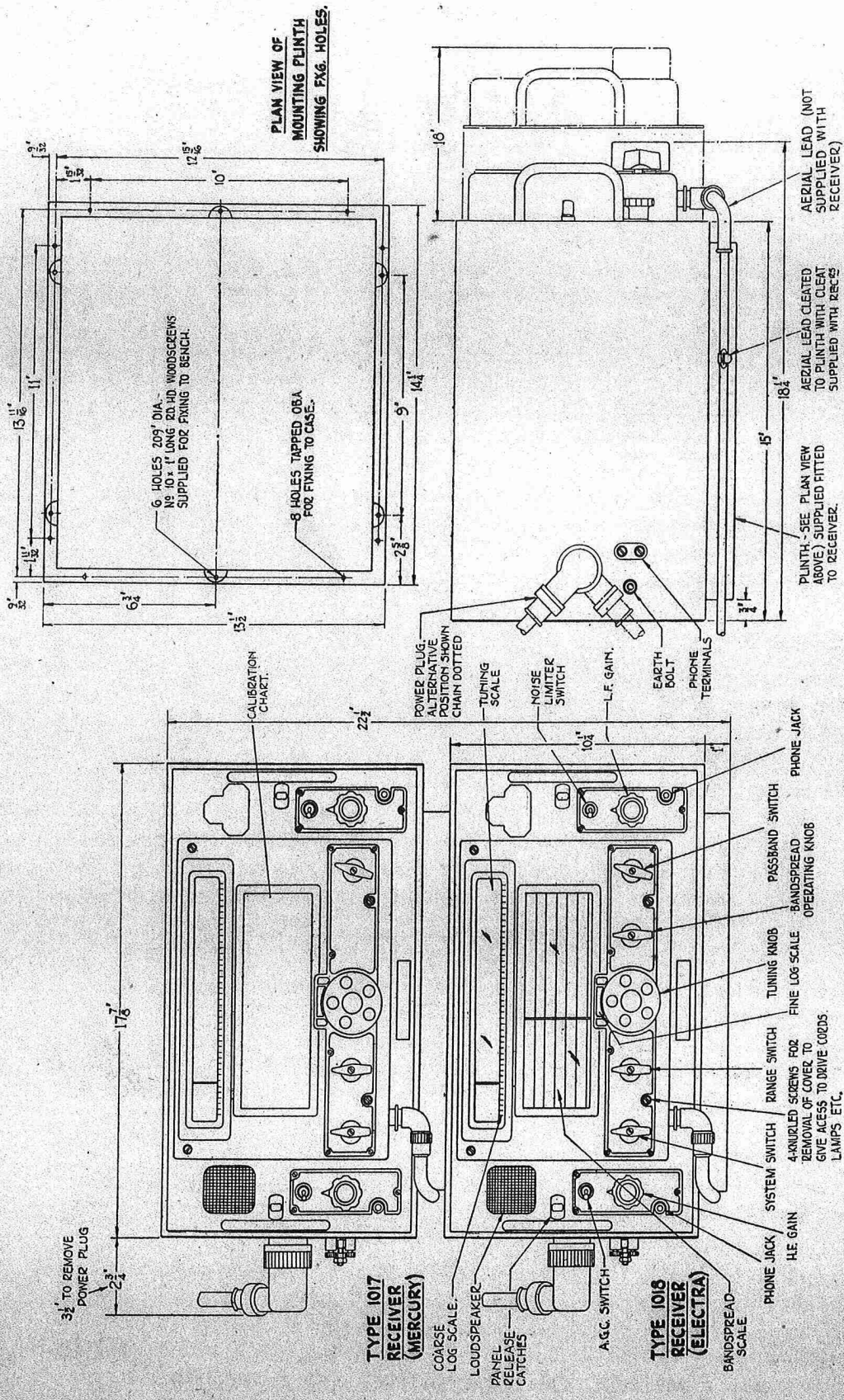
### 4.4. Aerial

The aerial need only consist of an open wire from 60 to 100 ft. long placed as high as is convenient. The receiver end of the aerial should be screened for about 12 to 20 ft. This feeder should be terminated in the aerial plug provided or to a junction box Type 799, care being taken to see that the braiding is connected to the plug case. A suitable cable is type PT.29.M. or A.S.42.M., etc. A diagram showing the method of connecting the screened cable to the aerial plug is shown on page 12.

### 4.5. Preset Adjustments

For a diagram showing the position of the desensitising potentiometer see page 28. Great care must be taken not to confuse this potentiometer with the other potentiometer mounted on top of the chassis. If the latter is accidentally rotated then refer to section 6.3.4.

Before applying power to the equipment check that the desensitising control is set fully anti-clockwise. The only exception to this is detailed in the section on 'Operation'. When the receiver is used by itself this desensitising resistance is shorted out by means of contacts on the relay Z2. When used in conjunction with a transmitter the relays Z1 and Z2 must be connected (via pin 1 of the seven pin socket) to the back contact of the transmitting key and thence to the 24 volt supply via a 100 ohms resistor so that the relays are energised for 'key down' position.



**OUTLINE DRAWING**

W.Z.4257

Issue No. 1  
Sheet No. 1

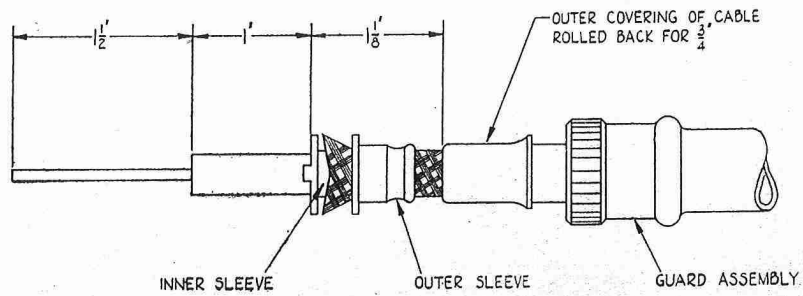


FIG. 1.

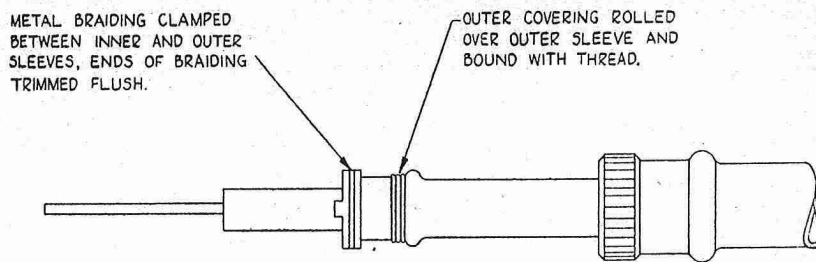
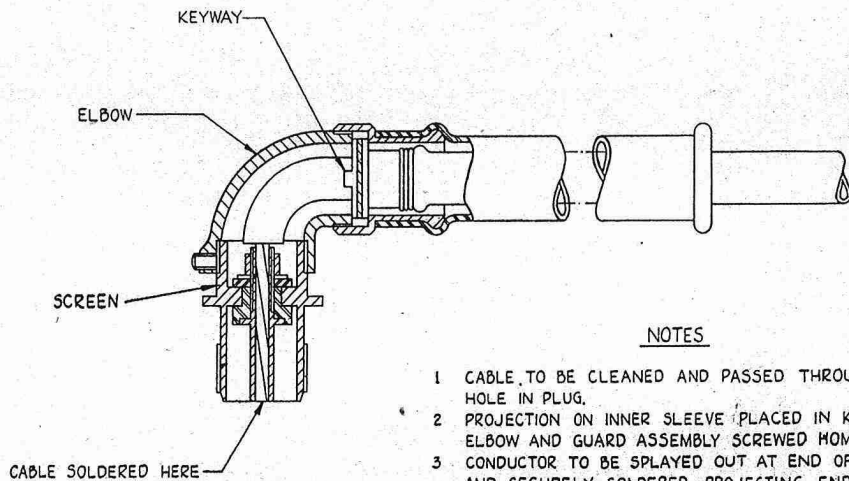


FIG. 2.



NOTES

- 1 CABLE TO BE CLEANED AND PASSED THROUGH HOLE IN PLUG.
- 2 PROJECTION ON INNER SLEEVE PLACED IN KEYWAY OF ELBOW AND GUARD ASSEMBLY SCREWED HOME.
- 3 CONDUCTOR TO BE SPLAYED OUT AT END OF PLUG AND SECURELY SOLDERED, PROJECTING ENDS TO BE TRIMMED FLUSH.

FIG. 3.

Issue No. 1  
Sheet No. 1

W.Z.4261

METHOD OF TERMINATING AERIAL FEEDER  
CABLE TO A.M. PLUG TYPE 161

## SECTION 5 OPERATION

After the receiver has been installed as detailed in the section entitled 'Installation' the receivers are ready for use. In general the functions of the major controls will be obvious but the following remarks may help to clarify some of the less obvious points. The positions of all front panel controls are shown on page 11. Details of operation of the power supply unit are given in the Appendix on power supply starting on page 83. The receivers take about one minute to warm up and are approximately stable after five minutes.

### 5.1. System Switch

Four positions are provided on the 'Mercury' (Type 1017) and five positions on the 'Electra' (Type 1018.)

The 'Off' position cuts off all power from the receiver, but does not affect the power supply unit. The 'Stand by' position connects the valve heater circuits and the scale lamps and in this position the receiver is ready for instant use when required. The 'Phone' position puts the H.T. supply into use and makes the receiver suitable for the reception of modulated C.W. signals. The 'CW' position brings into operation the beat-frequency oscillator.

#### 'Electra' (Type 1018)

The 'Scale check' position switches in a crystal oscillator. Details of its use are set out below in the paragraph on 'Bandspread'.

### 5.2. Range Switch

In all, five ranges are provided on both receivers. Details of the frequencies of each range can be seen on the calibration drum at the top of the panel. This drum is rotated to its correct range by the range switch. It will be seen that the frequencies between 250 kc/s and 520 kc/s and between 1.5 Mc/s and 4.0 Mc/s are covered on both receivers.

### 5.3. Passband Switch

Four positions are provided. The 'Wide' position is useful for searching and it also gives the best intelligibility of speech. It can only be used when little interference is present. The 'Intermediate' and 'Narrow' positions progressively narrow the passband and so reduce interference. More accurate tuning is required as the passband is narrowed. The 'Filter' position can only be used for C.W. reception, as it switches in a 1,000 c.p.s. note filter. This position is most useful on the lower frequencies and especially those around 15-40 kc/s where the frequency spacing of the transmissions is small.

The total widths of the passbands, for 6 db. attenuation are 'Wide'—8 kc/s, 'Intermediate'—3 kc/s, 'Narrow'—1 kc and 'Filter'—150 c.p.s.

### 5.4. Tuning Control

A reduction ratio of 80/1 in the tuning gives this control a sufficiently smooth action for accurate tuning; rapid movements from one part of the scale to another are facilitated by the flywheel action of the knob. For general tuning operations the bandspread handle, where fitted, should be pulled outwards so that it becomes disengaged from the main tuning drive.

Rotation of the tuning handle causes the main tuning pointer to move across the calibrated scale on the calibration drum. It also rotates a logging scale disc fitted directly to the main tuning spindle. Note that the numbers on this logging scale increase as the tuning handle is rotated clockwise.

On the lower side of the main calibration escutcheon plate numbers from 1 to 40 are engraved. The main pointer moves from one of these numbers to the next for each rotation of the tuning handle. In order to record the tuning setting of a transmission received the position of the pointer along this scale on the escutcheon plate and the angular setting of the logging scale disc should be recorded. When this is done the exact tuning point may be re-set quickly when required.

### 5.5. Bandspread Control

#### 'Mercury' (Type 1017)

A bandspread control is not provided on the above receiver.

#### 'Electra' (Type 1018)

It will be noticed on this receiver that there is a black rectangular spot on the main scale

drum corresponding to each of the six H.F. shipping bands. The bandspread scales expand these shipping bands directly in kilocycles. The system switch is set to 'Scale check' and the receiver tuning pointer set on to one of these black spots. (A diagram illustrating this text is given on page 15). Rotate the turning handle until the calibrator oscillator is heard and tune this to the zero beat at the left hand end of the black spot. Rotate the bandspread handle until the bandspread 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 the zero beat mentioned above the bandspread handle should be pushed in until it engages with the main tuning drive.

The system switch is now set to 'C.W.' and the bandspread is ready for use. The bandspread scales are calibrated directly in kilocycles 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 of course 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 will be noticed that on 'Scale check' the receiver is 'dead' to any external signal and so cannot be used for reception in this setting.

#### **5.6. Gain Controls**

With the A.G.C. switched 'On' the H.F. gain control should normally be fully clockwise and the L.F. gain set to give a convenient audio output. With the A.G.C. 'Off' the L.F. gain should be nearly fully clockwise and the H.F. gain set to obtain a convenient audio output.

The A.G.C. should always be switched 'On' unless the wanted signal is weak and it is situated near a stronger interfering signal.

#### **5.7. Noise Limiter**

This can normally be left switched 'On' as it introduces negligible distortion except in the case of very deep modulation; the insertion loss is only a few db.

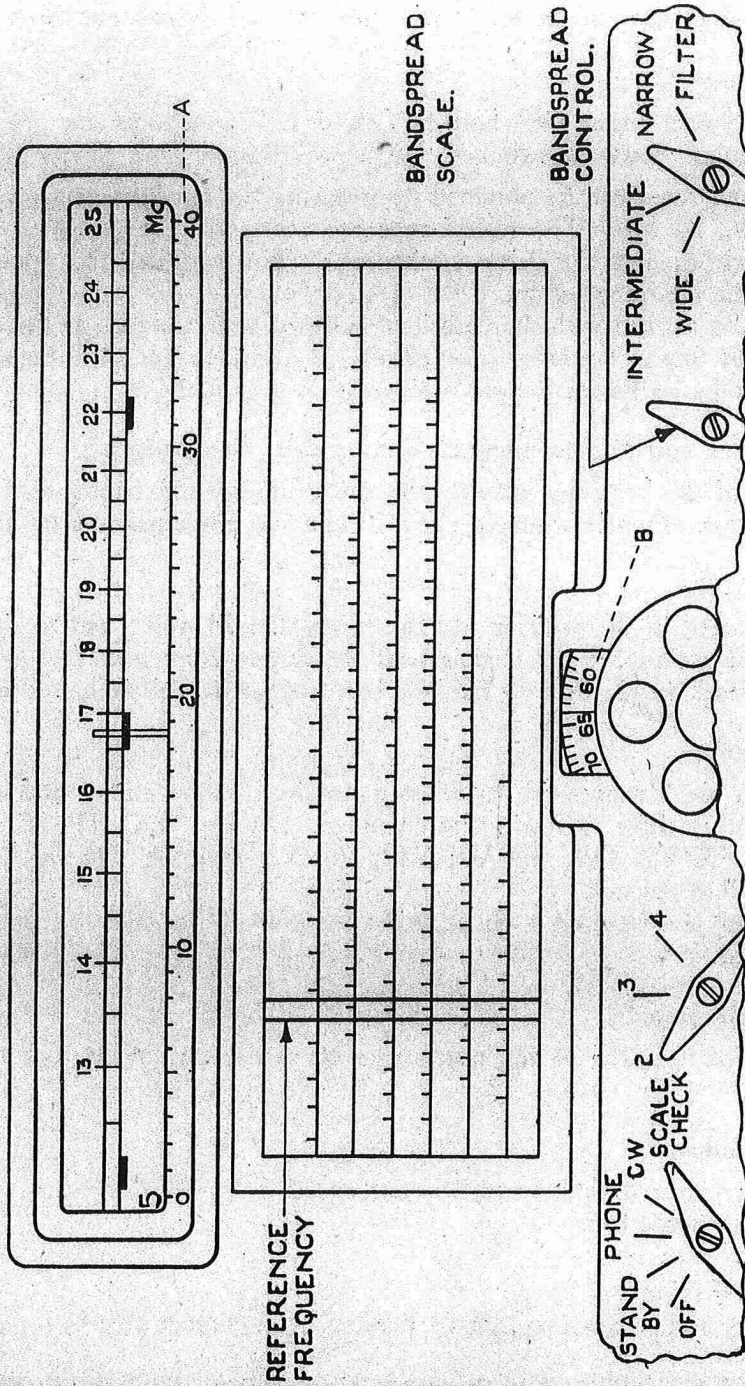
#### **5.8. Audio Output**

Two 'phone jacks are provided for low impedance 'phones. When these are removed from their jacks the receiver output is automatically switched to the small built-in 'speaker mounted on the front panel.

#### **5.9. Pre-set Adjustments**

[For the position of the desensitising potentiometer see page 28. Great care must be taken not to confuse this potentiometer with the other potentiometer mounted on the right of the chassis. If the latter is accidentally rotated then refer to section 6.3.4.]

If when the desensitising control is fully anticlockwise the recovery time of the receiver after it has been desensitised is too long, or it is desired to hear 'side tone' during transmission on a common frequency, then rotate the desensitising control clockwise until the desired setting is obtained.



Issue No. 1  
Sheet No. 1

BANDSPREAD CALIBRATING SCALE

W.Z.4318

## SECTION 6

### MAINTENANCE AND SERVICING

This section has been divided into four sub-sections. These are:—

- (a) Routine maintenance and replacement of consumable components.
- (b) Fault finding procedure.
- (c) Full circuit alignment checks which will have to be carried out in a depot with proper equipment.
- (d) Special servicing.

*Note.* With the System Switch set at 'Off', both H.T. and L.T. potentials are present in parts of the receiver wiring unless power is switched 'Off' at the Supply Unit (Type 889A or 966A).

Access to valves and fuses can be obtained by releasing the two fasteners on the panel and withdrawing the receiver from its case. The scale lamps are accessible after removal of the cover which protects the calibration drum and the drive mechanisms. This requires the removal of most of the control knobs and the four retaining screws.

The receiver may be worked with the chassis withdrawn from the case as the power lead from the case is sufficiently long for this to be done. (For details of Maintenance and Servicing of the power supply unit see the Appendix on Power Supply beginning on page 83.)

#### 6.1. Routine Maintenance and Replacement of Consumable Components

Light lubrication of the bearings carrying the main tuning and bandspread is needed approximately every three months. Switch contacts should under no circumstances be lubricated.

##### 6.1.1. Fuse Replacement

One fuse only is fitted in the receiver and this is in the 24 volt positive line. It is a Slydlok pattern and is located on the top of the chassis near the power input socket. The correct size of fuse wire is No. 24 S.W.G. lead tin (or No. 38 S.W.G. bare copper if lead tin is not available).

##### 6.1.2. Valve Replacements

The valve heaters are arranged in three groups of four valves and if one valve heater becomes open-circuited then the other three valves in that chain will not function. The three groups consist of V2, V1, V11, and V9; V3, V5, V10, and V7; V12, V6, V8, and V4. On the 1017 receiver V12 is replaced by R117, a 22 ohm resistor.

If loss of emission is suspected a substitution method of test may be carried out. The valve feeds may also be checked.

##### 6.1.3. Scale Lamp Replacement

These lamps are fed from the 24 volt heater line via a resistor. A 14 volt 0.2 amp lamp is the correct type required.

#### 6.2. Fault Finding Procedure

If a fault in the receiver develops which is not cured by the replacement of a valve or fuse the following notes may be of some help:—

##### 6.2.1. Preliminary Checks

(a) Plugs, sockets and valves may not be making good contact or grid top cap clips may not be in position.

(b) A fault may have developed in the desensitising relays. This may be checked by turning the desensitising potentiometer control fully clockwise and placing the aerial on tag 5 of S1 or directly on the top cap of V1. If the receiver is restored to a normal working condition then check to see which relay is unsatisfactory.

(c) A fault may have developed in the noise limiter circuit in which case switching the noise limiter off should render the receiver workable.

### 6.2.2. Circuit Check (Where test equipment is not available)

(a) If no noise output is heard check if hum is audible when the finger is placed on the grid of V10. Failure to obtain hum under these conditions indicates a failure in the H.T. of heater supply of V10 or V11 or a failure of these valves.

(b) If noise is present with the system switch at 'C.W.' which is variable by means of the L.F. gain control then the fault probably lies in the I.F. or frequency changer stages. If the noise is variable by means of the H.F. gain and varies when the selectivity switch is changed from 'Narrow' to 'Wide' the fault will probably lie in the frequency changer.

(c) If all these tests give satisfactory results an aerial should be put on to the grids of V3, V2 and V1 in turn. If on tuning to a powerful station a signal is received it may be assumed that the stages following are in order.

### 6.2.3. Circuit Check (requiring more elaborate equipment)

Any further diagnoses necessary will usually involve the measurements of circuit resistances, voltages and valve feeds.

#### (i) Resistance Tests

Resistance values can be checked to the table below and the tables on page 18. A tolerance of  $\pm 25\%$  may be assumed, unless otherwise stated.

The receiver should be switched 'On' but with the power plug and lamps removed. Set the System Switch at 'C.W.', the passband at 'Narrow' and all other controls fully clockwise, unless otherwise stated. The Noise Limiter and A.G.C. to be switched 'Off' and the Range Switch to be set at '5'.

Since the valve heaters are in series groups it will be found convenient to use a set of 50 ohms  $\pm 5\%$  resistors mounted on valve bases, and to plug in these in place of the valves when checking heater circuit continuity.

The resistance values in the tables below assume the use of such resistors in all valve-holders, except V13. In the case of tables on page 18 it is assumed that an adaptor plug and switch is used, in which case the 50 ohms resistance would be removed from the particular valve-holder being checked.

#### (a) Input Power Plug Test 'Mercury' (Type 1017) and 'Electra' (Type 1018).

<i>Test Points</i>	<i>Resistance Value (ohms)</i>
Pin 1 and Earth	$20,500 \pm 25\%$
Pin 2        "	infinite
Pin 3        "	$63 \pm 10\%$
Pin 4        "	0
Pin 5        "	$500 \pm 10\%$



(b) Valveholder Resistances (ohms)

'Mercury' (Type 1017)

Test Points	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V13
H.T. Positive to Valve Pin 3	3,600	3,600	3,600	3,600	3,600	3,600	120,000	96,000	520,000	110,000	2,000	81,000
Valve Pin 4	44,000	31,000	19,000	114,000	42,000	68,000	28,000	100,000	4.0 MΩ	1.0 MΩ		
Valve Pin 5	21,000	21,000	120,000	68,000	21,000	28,000	28,000	68,000	520,000	220,000	1.0 MΩ	78,000
Earth to Top Cap	770,000	100,000	100,000	0	100,000	670,000		100,000	2 MΩ			
" Valve Pin 5	0	0	100,000	47,000	0	0	6,800	47,000	500,000	200,000	1 MΩ	23,000
" Pin 8	470	470	330	330	680	680	100,000	0	4.0 MΩ	17,000*	680	
" Pin 8	5,500	470	330	330	5,700	1,400	100,000	0	4.0 MΩ	17,000*	680	
(H.F. gain control fully anti-clockwise and Selectivity set at 'Intermediate')												
L.T. Positive to Pin 2	50	243	243	100	193	22	150	150	93	143	100	
L.T. Negative to Pin 2	143	150	150	0	100	122	243	50	0	50	193	

\* Polarity must be observed for these readings, i.e. when using an Avometer the positive lead must be collected to earth.

(c) Valveholder Resistances (ohms)

'Electra' (Type 1018)

Test Points	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11**	V12	V13
H.T. positive to Valve Pin 3	3,600	3,600	3,600	59,000	3,600	3,600	120,000	70,000	520,000	110,000	2,000	57,000	56,000
Valve Pin 4	31,000	57,000	57,000		50,000	68,000	25,000	77,000	4.0 MΩ	1.0 MΩ		57,000	
Valve Pin 5	21,000	500,000	500,000	45,000	21,000	21,000	25,000	70,000	520,000	220,000	1.1 MΩ	21,000	55,000
Earth to Top Cap	770,000	100,000	100,000		570,000	690,000		2.2 MΩ		2 MΩ		330,000	
Valve Pin 5	0	0	470,000	22,000	0	0	4,700	47,000	500,000	200,000	1 MΩ	0	35,000
Valve Pin 8	470	470	330	0	330	680	100,000	0	4.0 MΩ	17,000*	680	1.6	
Valve Pin 8	5,500	470	330	0	5,500	1,150	100,000	0	4.0 MΩ	17,000*	680	1.6	
(H.F. gain control fully anti-clockwise and Selectivity set at 'Wide')													
L.T. Positive to Pin 2	50	250	250	100	200	50	150	150	100	150	100	0	67
L.T. Negative to Pin 2	150	150	150	0	100	150	250	50	0	50	200	100	0

\* Polarity must be observed for these readings, i.e. when using an Avometer the positive lead must be connected to earth.

\*\* When measurements are taken on V12, the system switch should be set to 'Scale Check'.

(ii) Voltage Checks

For these tests all the valves and lamps should be fitted to the receivers: the power supply unit to be connected to 230 v. A.C. Mains: the H.F. and L.F. gain controls to be set fully clockwise: the system switch set at 'C.W.', unless otherwise stated and the passband switch set at 'Narrow': the Range Switch to be at '2', unless otherwise stated: the Noise Limiter and A.G.C. to be switched 'Off'. Measurements should be made with an 'Avometer' model 7, on range (0-400 v.).

(a) Feed Metering Board 'Mercury' (Type 1017) and 'Electra' (Type 1018).

<i>Test Points</i>	<i>Voltage</i>
H.T. Positive to Earth ... ..	210 v. $\pm$ 10%
Stabilised Voltage to Earth ... ..	150 v. $\pm$ 5%

(b) Valve Holders

<i>Test Points</i>	<i>Valve</i>	<i>Range Switch</i>	<i>System Switch</i>	<i>'Mercury' Type 1017 Voltage</i>	<i>'Electra' Type 1018 Voltage</i>
Pin 4 to Earth	V1	2	CW	80	70
" "	V2	2	CW	85	70
" "	V3	2	CW	60	60
" "	V4	2	CW	50	—
" "	V4	5	CW	85	—
" "	V5	2	CW	70	70
" "	V6	2	CW	95	90
" "	V8	2	CW	45	65
" "	V8	2	Phone	0	0
" "	V12	2	Scale Check	—	90
Pin 8 to Earth	V7	2	CW	0	0
" "	V7	2	Phone	16	16
" "	V10	2	CW	11	11

(c) H.F. Gain Control 'Mercury' (Type 1017) and 'Electra' (Type 1018).

<i>Test Point</i>	<i>Control Setting</i>	<i>Voltage</i>
Slider to Earth	Fully Clockwise	0
" "	Fully Anti-Clockwise	26

(iii) Valve Feeds

The valve feeds are most conveniently measured at the special metering board on the left hand side of the chassis.

Set the system switch at 'C.W.'; the passband at 'Narrow' and the range at '1'. Measurements should be made with an Avometer on the 0-10 mA range.

Valve	Feed (mA) $\pm 20\%$	
	'Mercury' Type 1017	'Electra' Type 1018
V1	6.2	5.4
V2	6.0	5.4
V3 (Hexode)	1.5	1.7
V3 (Triode)	3.5	—
V3 (Hexode Range 4)	2.3	—
V3 (Triode Range 4)	4.0	—
V4 (Hexode Range 4)	3.8	—
>> V4 (Triode Range 4)	4.0	8.0
> V5	6.5	6.5
V6	5.4	5.2
> V8	6.0	9.5
V10	0.65	0.65
V11	8.3	8.3

(iv) If a signal generator covering the required frequency range, an output meter and a tone generator are available then the location of a fault should be considerably accelerated. Full details of inter-stage levels are set out in section 6.3.7 but the summary below will be of value:—

Injection Point	Frequency of Input Signal	Input Levels required for 1 mW into 1,000 ohms	
		'Mercury' Type 1017	'Electra' Type 1018
Grid of V11	400 c.p.s.	1.2 V.	1.2 V.
Grid of V10	400 c.p.s.	35.0 mV.	35.0 mV.
Grid of V6	85 kc/s	60.0 mV.	—
Grid of V6	690 kc/s	—	35 mV.
Grid of V5	85 kc/s	650.0 $\mu$ V.	—
Grid of V5	690 kc/s	—	450 $\mu$ V.
Grid of V4	85 kc/s on Range 4 and 5	35.0 $\mu$ V.	—
Grid of V3	4.5 Mc/s on range 4 and 5	3.0 $\mu$ V.	—
Grid of V3	85 kc/s on Range 1, 2 and 3	15.0 $\mu$ V.	—
Grid of V3	690 kc/s	—	30 $\mu$ V.
Grid of V2	500 kc/s	—	—
Grid of V1	500 kc/s	—	—
Aerial via 200 $\mu\mu$ F	500 kc/s	—	—

For the above tests the following conditions should be observed:—

- (a) Selectivity at 'Narrow'.
- (b) A.G.C. and Noise Limiter at 'On'.
- (c) H.F. and L.F. gain controls fully clockwise.
- (d) All signals except that applied to V10 and V11 grids to be modulated to 30% by 400 c.p.s.
- (e) 0.1  $\mu$ F condenser to be placed between the generator and the test injection point.

### 6.3. Full Circuit Alignment Check

The instructions that follow will cover the alignment of all the circuits in the receiver. For this work the following equipment and apparatus is required:—

- (a) Tone Generator giving audio frequencies up to 5 kc/s and fitted with an attenuator which will vary the final output continuously from 5 mV to 1 volt.
- (b) Signal generator giving carrier frequencies from 15 kc/s to 25.0 Mc/s and capable of being modulated by 400 c.p.s. to a depth of 30%.
- (c) Output meter matched to 1,000 ohms which will read levels from 0.1 mW to 10 mW.
- (d) Meter to read resistances, voltages and currents, such as an Avometer Model 7.
- (e) Isolating condenser of 0.1  $\mu$ F for use with the above generators.

#### 6.3.1. Circuit Tests

The resistances of the various circuits should be measured according to the tables given on pages 17 and 18. The valve feeds and potentials at selected points should be measured and compared with the figures given in the tables on page 20.

#### 6.3.2. Low Frequency Tests

With the L.F. gain fully clockwise a tone generator connected via 0.1  $\mu$ F at V11 and V10 grids in turn should give 1.0 mW into 1,000 ohms for the following inputs:—

Grid V11 (pin 5) ...	... ..	... ..	0.8 volts at 1,000 c.p.s.
Grid V10 (top cap) ...	... ..	... ..	...25.0 mV at 1,000 c.p.s.

#### 6.3.3. Intermediate Frequency Tests

For these tests the System Switch should be at 'Phone', the selectivity switch at 'Narrow', the A.G.C. and Noise Limiter 'Off', and all other controls fully clockwise.

##### (a) Gain Check

When a carrier modulated by 400 c.p.s. to a depth of 30% is injected at the various I.F. grids in turn the inputs levels for 1 mW output into 1,000 ohms after circuit alignment should be as below:—

<i>Injection Points</i>	<i>Frequency of Input Signal</i>	<i>Input Levels required for 1 mW. into 1,000 ohms</i>	
		<i>'Mercury' Type 1017</i>	<i>'Electra' Type 1018</i>
Grid of V6	85 kc/s all ranges	60 mV.	—
	690 kc/s range 1	—	35 mV.
Grid of V5	85 kc/s all ranges	650 $\mu$ V	—
	690 kc/s range 1	—	450 $\mu$ V
Grid of V3	4.5 Mc/s on range 4 and 5	3 $\mu$ V	—
	85 kc/s on range 1, 2 and 3	15 $\mu$ V	—
	690 kc/s range 1	—	30 $\mu$ V

### (b) Passband Check

A generator should be connected at V3 grid and be modulated to 30% by 130 c.p.s. (400 c.p.s. will do if 130 c.p.s. is not available). The range switch should be at '3'. Adjust the input so that the output at full gain is 1 mW. Set the input level to twice the above value and retune in each direction until the output falls to 1 mW.

The difference between these detune frequencies for the various passband positions should be as given below:—

Passband Switch Position	Total Passband	
	'Mercury' Type 1017	'Electra' Type 1018
Wide	8.5 kc/s	8.5 kc/s
Intermediate	3.7 kc/s	3.3 kc/s
Narrow	1.3 kc/s	1.2 kc/s

### (c) Realignment

If the above figures are not met then the I.F. circuits will have to be re-aligned. Alignment should only be undertaken if there are real grounds to justify it and if an accurate source of frequency is available. After alignment all trimmers which have had their seal broken must be resealed by the application of some 'Philityne' wax or any similar sealing wax.

A diagram showing the positions of the trimmers mentioned below may be seen on pages 28 and 29. An alignment oscilloscope will facilitate the alignment of the Type 1018 receiver.

Alignment may be undertaken as set out below:—

#### 'Mercury' (Type 1017)

Only the trimmer condensers need be adjusted as the inductances are set up and sealed before leaving the factory. Inject an 85 kc/s carrier modulated by 400 c.p.s. to a depth of 30% at the grid of V4 via a 0.1  $\mu$ F blocking condenser. The selectivity should be at 'Narrow' and the range on '4'. In turn adjust trimmers C148 and C146, C139 and C136, C129 and C119 until maximum output is obtained. Alter the input frequency to 4.5 Mc/s and adjust trimmer C124 for maximum output. Alter the injection point of the generator to the grid of V3 and keep its frequency at 4.5 Mc/s. In this position adjust trimmers C86 and C82, C77 and C59 for maximum output. The I.F. should now be aligned correctly.

#### 'Electra' (Type 1018)

##### Without an Oscilloscope

Set the system switch to 'Phone' and selectivity switch to 'Intermediate'. Short the live end of the oscillator tuned circuit to earth. Modulate the signal generator with 130 c/s tone and inject the 690 kc/s modulated signal at the grid of V6 via an isolating condenser of 0.1  $\mu$ F and align C146 and C148 for maximum audio output. Move the input to the grids of V5 and align C136 and C139 for maximum output.

Move the input to the grid of V3 and align C59, C62, C64 and C72.

The selectivity switch should now be set to 'Narrow' and the crystal trimming condensers C68 and C69 (on underside of chassis) adjusted to their safe minimum positions, i.e. about  $3\frac{1}{2}$  turns from their maximum positions. Retune the generator for maximum output, align C66 for maximum output and retrim C59, C62, C72, C136, C139, C146 and C148.

Vary the frequency of the signal slightly to find the dip in the response curve (if the dip cannot be found the frequency mid-way between the 6 db down points should be used) and when on this frequency retrim C64, C66 and C72 for maximum output. Retune the generator to the frequency mid-way between the 6 db down points (6 db down from larger peak) with the selectivity switch

at 'Intermediate' and retrim C59, C62, C72, C136, C139, C146 and C148. Reset the passband to 'Narrow' and adjust the input level so that the maximum response point brings the output to 1 mW. Tune the generator to a frequency 5 kc/s above the mid-band frequency and turn the input up by 60 db. Screw in the appropriate crystal trimmer C68 or C69 so that the output returns to 1 mW. Now tune the generator to a frequency 5 kc/s below the mid-band frequency and if the attenuation is not equal to 60 db, adjust the crystal trimmers so that the 60 db down points are removed from the mid-band frequency by the same amount (which should be less than 5 kc/s.)

Remove the lead shorting the oscillator coil.

#### *With an Oscilloscope*

If an alignment oscilloscope is available (such as M.I. type T.F. 852) then the alignment procedure mentioned above may be shortened considerably. The new procedure is as follows:—

[Should the alignment oscilloscope not be set up for 690 kc/s then this may be done briefly as follows:—Plug in the 600 kc/s coil and adjust the frequency by reducing C22 to approximately 68  $\mu\mu\text{F}$ . Next check the oscilloscope as laid down in paragraph 2.4 of the 'Operating Instructions' supplied with the oscilloscope.]

Set the system switch to 'Phone', the passband switch to 'Intermediate' and short the live end of the oscillator tuned circuit to earth. Inject a modulated signal to V3 grid via a 0.1  $\mu\text{F}$  blocking condenser. Adjust trimmers C59, C62, C64, C72, C136, C139, C146 and C148 for maximum audio output.

Unscrew trimmers C68 and C69, to be found on the underside of the chassis, to their safe minimum positions, i.e. about  $3\frac{1}{2}$  turns from their maximum positions. Set the passband switch at 'Narrow'. Remove generator and inject from the alignment oscilloscope on to V3 grid. Clip the alignment oscilloscope input head on to pin 5 of the detector valve V7.

Adjust C66 so that a maximum response is obtained on the oscilloscope and the dip between the maximum points is smallest. Bring the response curve to a position symmetrically about the 0 kc/s vertical line by means of the tuning control on the oscilloscope.

Reset the passband to 'Intermediate' and retrim all the I.F. trimmer condensers except C66 so that the maximum response is obtained on the 0 kc/s line. Reset the passband to 'Narrow' and retrim C66 and C72 to minimise the dip in the response curve; this should be only a very small adjustment.

Remove the oscilloscope leads from V3 and replace the generator. Inject an unmodulated carrier at a frequency mid-way between the 6 db down points on 'Narrow' and note the response curves. Adjust the generator level so that the maximum response point brings the trace on the oscilloscope to the 6 db line.

Tune the generator to 5 kc/s above the frequency noted above, turn up the input by 60 db and screw in the appropriate crystal trimmer (C68 or C69) so that the trace is returned to the -6 db line. Tune the generator to 5 kc/s below the same frequency and if the attenuation is not equal to 60 db adjust the crystal trimmer so that the 60 db attenuation points are removed from the mid-band frequency by the same amount—this should be less than 5 kc/s.

Remove the lead shorting the oscillator circuit.

#### 6.3.4. Balanced Demodulator Adjustments

(For a diagram of the position of the potentiometer R83 concerned see page 28). The balancing is done by placing the system switch to 'C.W.' and replacing the B.F.O. valve V8 by a KTW61. A modulated signal set accurately to the I.F. frequency is applied to V5 grid with the passband at 'Narrow'. The potentiometer R83 is adjusted for minimum audio output. When this is done the X61M valve is restored to its position on the receiver.

#### 6.3.5. Beat Frequency Oscillator Adjustments

Apply a C.W. signal at V5 grid and adjust C157 with the passband at 'Filter' until a 1,000 c.p.s. note is heard. If two positions of the trimmer can be found giving a 1,000 c.p.s. output then the one with the trimmer more screwed out is used.

#### 6.3.6. Calibration Check

If the calibration of the receiver is not accurate then realignment of the 1st oscillator may have to be undertaken, but this should only be attempted if an accurate source of frequency is available, and there are real grounds to justify it. (The alignment should not be affected sufficiently by valve replacement to justify realignment.) The signal from the generator should be injected at V3 grid and should be modulated by 400 c.p.s. to a depth of 30%. The selectivity switch should be at 'Intermediate'.

The oscillators should be set up at frequencies corresponding to the extreme calibration marks of each range as indicated on the calibration drum. At the low frequency ends of the ranges the inductance trimmers L16 to L20 inclusive should be adjusted depending on the range. At the high frequency ends of the ranges the capacity trimmers C97, C98, C99, C101 and C102 should be adjusted, depending on the range.

On the Type 1017 receiver on range 1 only a C.W. signal should be used and the selectivity switch set at 'Filter'.

#### 6.3.7. Signal Frequency Tests

Set the selectivity switch at 'Narrow' and the system switch at 'Phone'. Inject a signal modulated by 400 c.p.s. to a depth of 30% at V3, V2 and V1 grids via 0.1  $\mu$ F and at the aerial terminal via the appropriate dummy aerial. The intervalve gains and the aerial step-ups for a constant output should be as indicated in the tables below. The H.F. gain control should be fully clockwise and the A.G.C. 'Off'.

(a) 'Mercury' Receiver (Type 1017)

Range	Frequency	Gain		Aerial Circuit Step-up	
		V1-V3 grid	V1-V2 grid	Dummy Aerial	
1	15 kc/s	3 db.		200 $\mu\mu$ F	-2 db.
	40 kc/s	15 db.			+20 db.
2	100 kc/s	2 db.		200 $\mu\mu$ F	3 db.
	250 kc/s	11 db.			3 db.
3	250 kc/s	10 db.		200 $\mu\mu$ F	3 db.
	640 kc/s	15 db.			7 db.
4	640 kc/s	6 db.		200 $\mu\mu$ F	13 db.
	1,600 kc/s	11 db.			15 db.
5	1,600 kc/s	11 db.		200 $\mu\mu$ F	11 db.
	4,000 kc/s	9 db.			9 db.

(b) 'Electra' Receiver (Type 1018)

Range	Frequency	Gain		Aerial Circuit Step-up	
		V2-V3 grid	V1-V2 grid	Dummy Aerial	
1	250 kc/s	9 db.		200 $\mu\mu$ F	6 db.
	520 kc/s	15 db.			5 db.
2	1.5 Mc/s	16 db.		200 $\mu\mu$ F	18 db.
	3.0 Mc/s	18 db.			25 db.
3	3.0 Mc/s	16 db.		75 ohms	19 db.
	6.0 Mc/s	16 db.			20 db.
4	6.0 Mc/s	13 db.		75 ohms	14 db.
	12.0 Mc/s	16 db.			15 db.
5	12.0 Mc/s	14 db.		75 ohms	7 db.
	25.0 Mc/s	20 db.			2 db.

If the above figures are not met then the following procedure should be adopted.

(c) Alignment of Signal Frequency Circuits

The signal should be injected at the aerial via the appropriate dummy aerial. The setting up frequencies are as indicated in the tables below. At the low frequency end the inductance trimmers L1 to L5, L6 to L10 and L11 to L15 inclusive are adjusted, depending on the range, while at the high frequency end the capacity trimmers C8, C9, C11, C12 and C13; C27, C28, C29, C31 and C32; and C46, C47, C48, C49 and C51 are adjusted, again depending on the range. These tests are carried out with a modulated signal and with the selectivity switch at 'Intermediate'.

'Mercury' (Type 1017)

For range 1 only on the 'Mercury' receiver the signal should be C.W. and the selectivity at 'Filter'.

'Electra' (Type 1018)

On range 5, particularly at the H.F. end on the Type 1018 receiver some 'pulling' of the 1st oscillator may be experienced. To counteract this the main tuning should be rocked slightly to restore maximum output after each adjustment of C51.



Range	'Mercury' (Type 1017)		'Electra' (Type 1018)	
	Dummy Aerial	H.F. Alignment Frequencies	Dummy Aerial	H.F. Alignment Frequencies
1	200 $\mu\mu$ F	15.8 kc/s 37.0 kc/s	200 $\mu\mu$ F	255 kc/s 510 kc/s
2	200 $\mu\mu$ F	106.5 kc/s 235 kc/s	200 $\mu\mu$ F	1.52 Mc/s 2.98 Mc/s
3	200 $\mu\mu$ F	265 kc/s 595 kc/s	75 ohms	3.03 Mc/s 5.92 Mc/s
4	200 $\mu\mu$ F	680 kc/s 1,535 kc/s	75 ohms	6.13 Mc/s 12.35 Mc/s
5	200 $\mu\mu$ F	1,600 kc/s 3,700 kc/s	75 ohms	12.66 Mc/s 24.70 Mc/s

### 6.3.8. Overall Tests

If extensive re-alignment has been done it is desirable to follow up the above tests with certain overall tests such as sensitivity and image protection. The specification required for these tests are given in the section on Performance data, paragraph 3.3.

## 6.4. Special Servicing

### 6.4.1. Replacement of Calibration Drum Drive Cord

This will require reference to page 47. The cover over the drive mechanisms will first of all have to be removed. The calibration drum is next taken off by removing the right hand bracket.

Inspect the spring inside the drum. This should be anchored to the left hand drum end cheek at one end and through a hole in the spindle at the other end.

Pass the loop end of the new drive cord over the anchor point on the inside of the left hand drum through the eyeletted hole in the left hand end cheek and fit it as shown in the figure. The calibration drum may now be put back in position, taking special care that the  $\frac{1}{8}$  inch wide slot in the left end of the calibration drum locates with the plunged hole in the left end cheek. The right hand bracket should now be fitted. The cord is now made to pass over the two pulleys 'A' and 'B' as shown in the figure, and the nipple end of the cord is fitted into the slot on the wheel 'C' fitted on the range switch spindle.

It will be necessary now to introduce some tension into the cord. First of all release the spindle clamping screws and hold the calibration drum. Fit a screwdriver into the spindle slot and rotate the drum spindle eight times in an anti-clockwise direction, i.e. when looking from the left hand side of the panel towards the screwdriver slot provided. Finally the spindle clamping screw should be tightened.

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 'C' on its shaft.

### 6.4.2. Replacement of Calibration Pointer Drive Cord

This will require reference to page 46. First of all remove the cover over the drive mechanisms and in the case of the 1018 receiver the bandspread calibration scale as well. Rotate the main tuning handle fully anti-clockwise.

Fit the looped part of the new cord over the spring on the large pulley 'D' driven from the main tuning. Take the shorter end of the cord and pass it through the slot in this pulley and wind it approximately once in an anti-clockwise direction around this pulley. The cord now passes around the upper left hand pulley 'E' and is fitted on to the pointer carriage.

The longer end of the cord is now wound around the large pulley 'D' for  $\frac{3}{4}$  turn in a clockwise direction and passes over the jockey pulley 'G' and then around the right hand pulley 'F' and so to the pointer carriage.

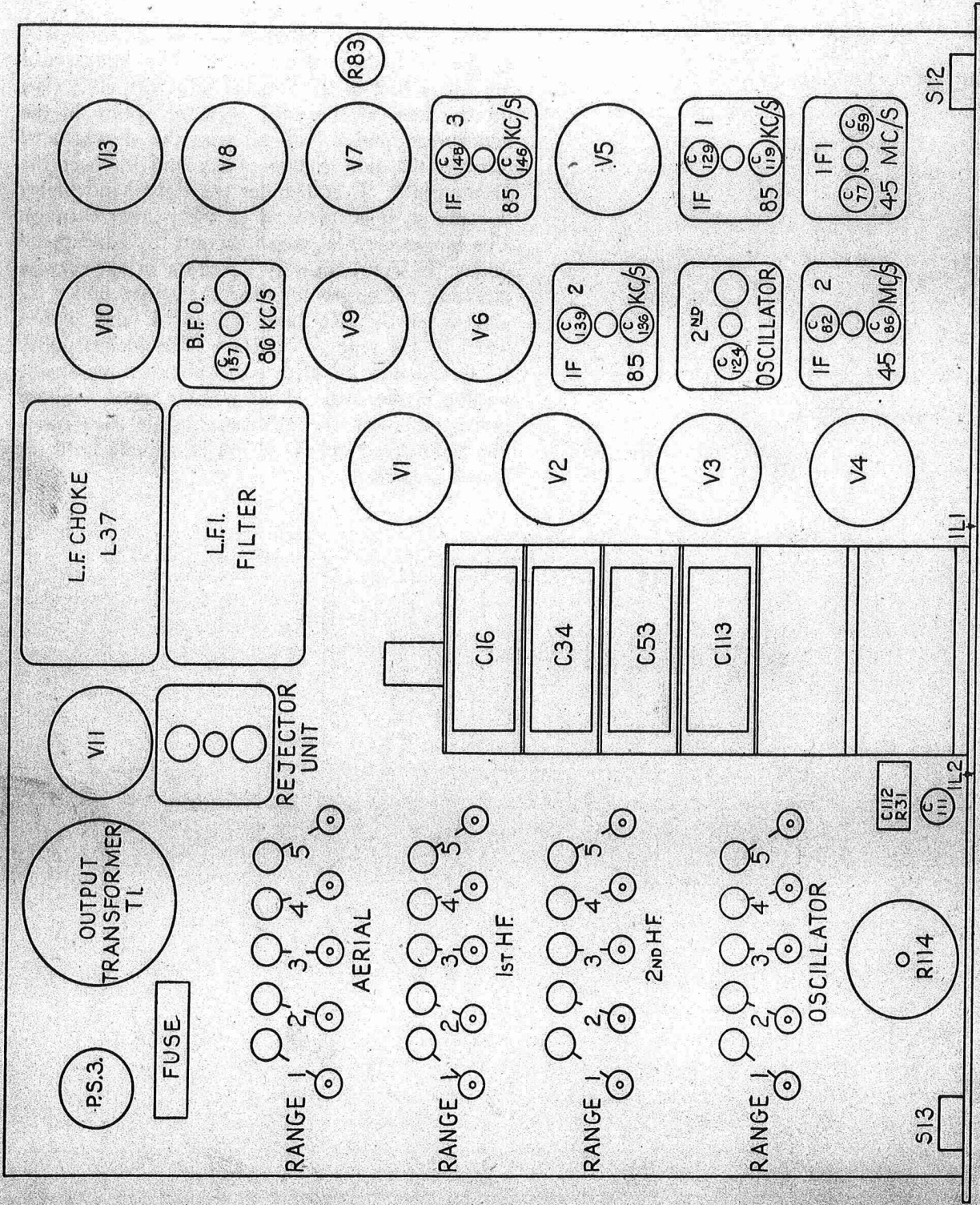
With the tuning set fully anti-clockwise see that the pointer coincides with the extreme left end of the calibration scales. This may be adjusted by rotating the pulley 'A' on its spindle in the necessary direction. See that the jockey pulley 'G' is low enough for the bandspread pointer to pass by (in the case of the 1018 receiver) and high enough to get sufficient tension in the cord.

### 6.4.3. Replacement of Bandsread Pointer Drive Cord

*'Electra' Type 1018*

This will require reference to page 46. Remove the cover over the drive mechanisms and also the bandsread calibration scale.

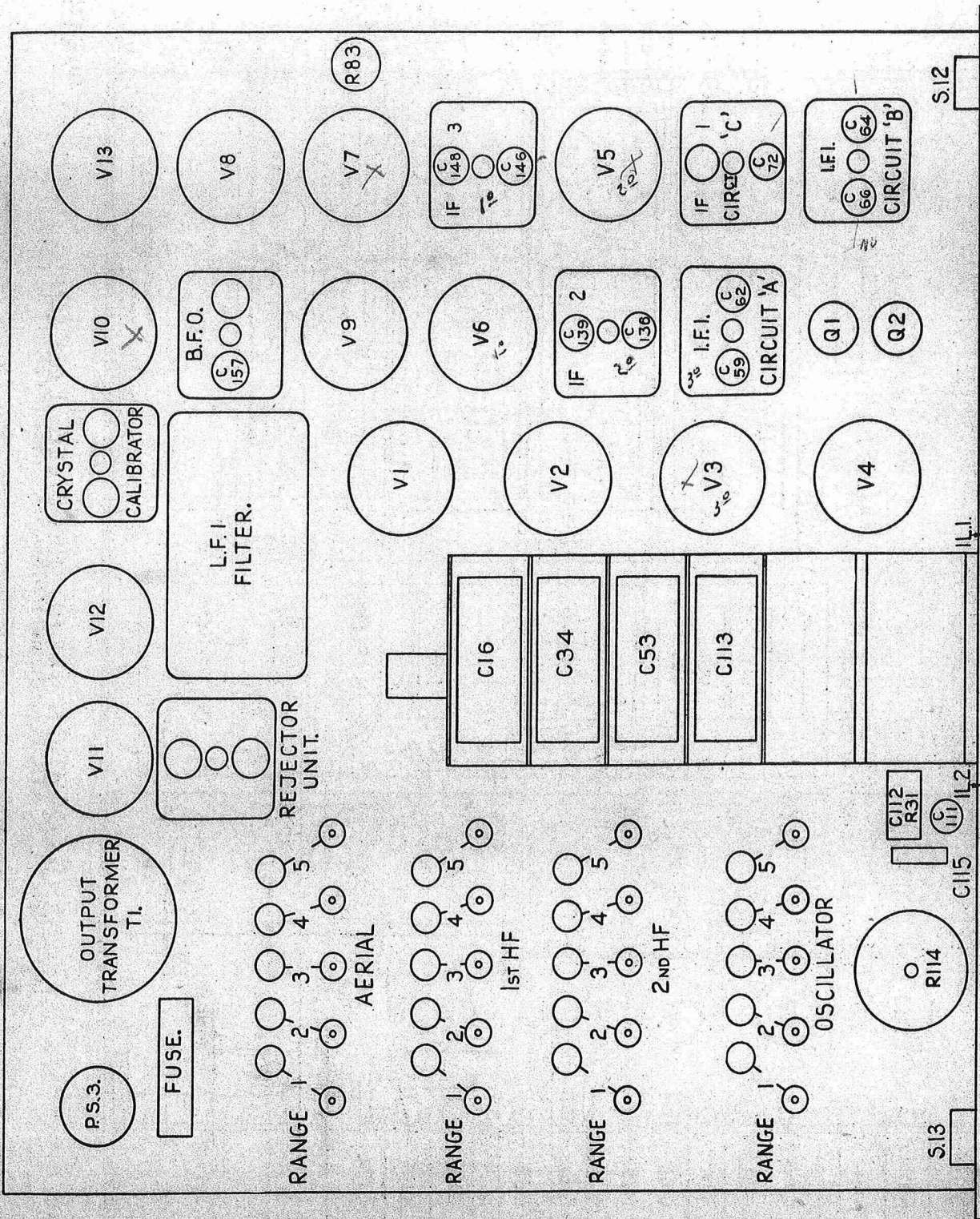
The new cord is fitted in almost the same way as the calibration drive cord. The bandsread control is first of all rotated fully anti-clockwise. Fit the loop in the cord over the spring in the bandsread pulley 'H' and pass the shorter cord through the slot in this pulley and up over the jockey pulley 'J' and under the right hand pulley 'K' and so it is fitted on to the pointer carriage. The longer cord is passed around the bandsread pulley 'H' approximately  $2\frac{1}{2}$  times in a clockwise direction. It passes up over the centre pulley 'L' and under the left hand pulley 'M' and is then fitted to the pointer carriage. The jockey pulley 'J' should now be adjusted to obtain a reasonable tension in the cord. If the pointer travel does not correspond with the calibration scale then rotate the bandsread pulley 'H' on its spindle until the travel is correct.



COMPONENT LOCATION (TOP) RECEIVER TYPE 1017

Issue No. 1  
Sheet No. 1 (continued on 2)

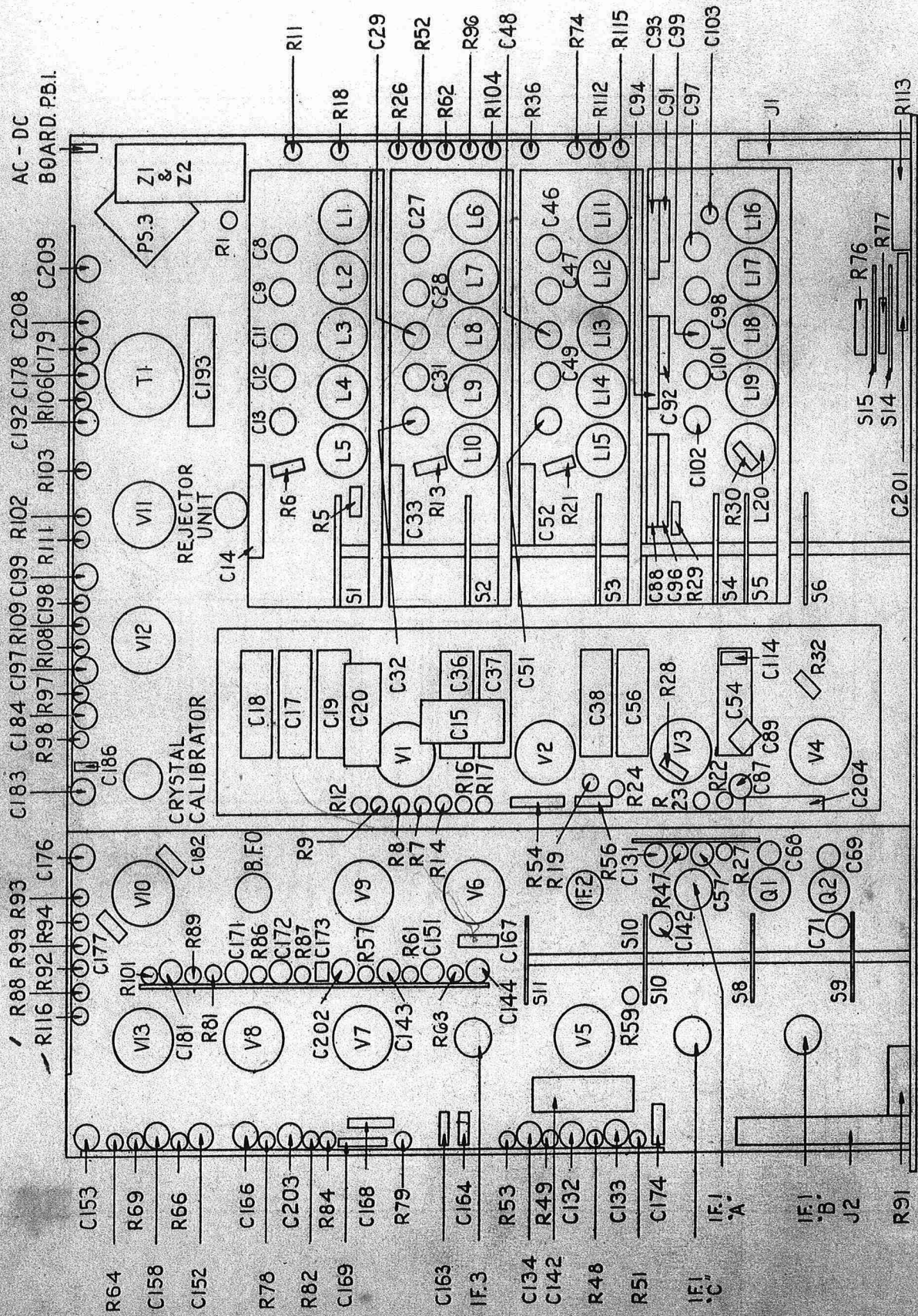
W.Z.4262



COMPONENT LOCATION (TOP) RECEIVER TYPE 1018.

Issue No. 1  
Sheet No. 1 (continued on 2)

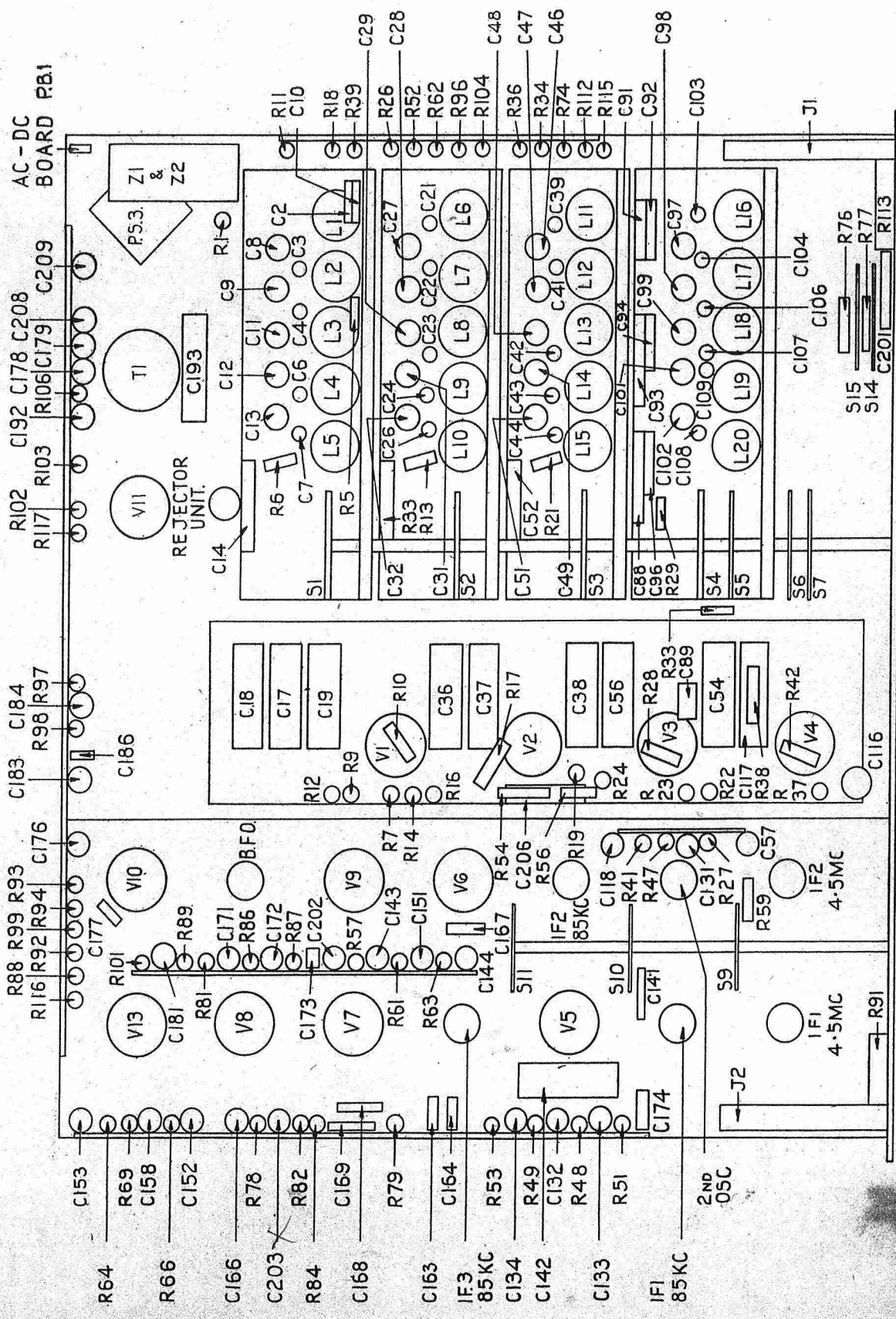
W.Z.4263



W.Z.4262/B

COMPONENT LOCATION (underside) 'MERCURY' RECEIVER (TYPE 1017)

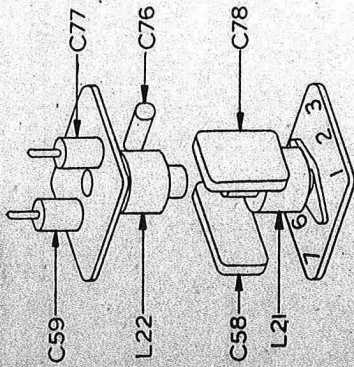
Issue No. 1  
Sheet No. 2



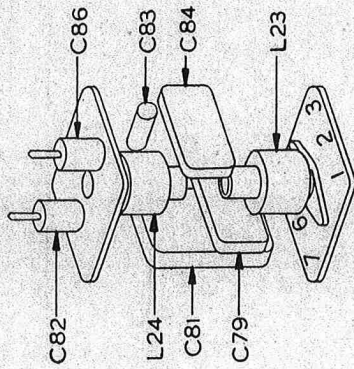
W.Z.4263/B

COMPONENT LOCATION (underside) 'ELECTRA' RECEIVER (TYPE 1018)

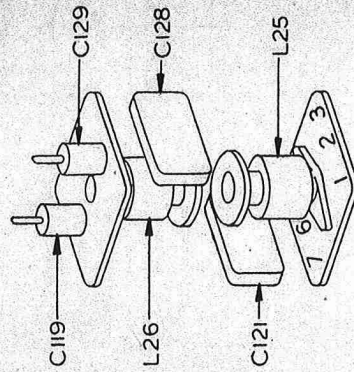
Issue No. 1  
Sheet No. 2



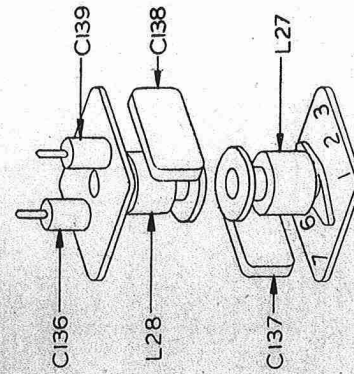
1ST IF COIL ASSEMBLY  
4.5 MC/S.



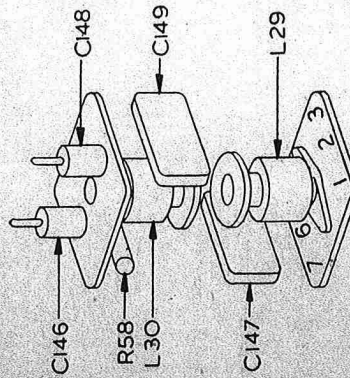
2ND IF COIL ASSEMBLY  
4.5 MC/S.



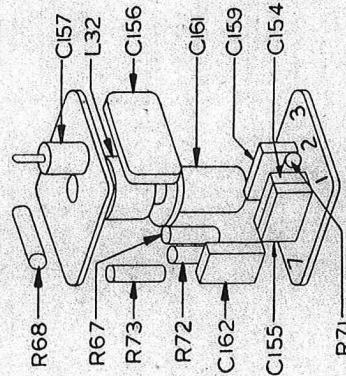
1ST IF COIL ASSEMBLY  
85 KC/S.



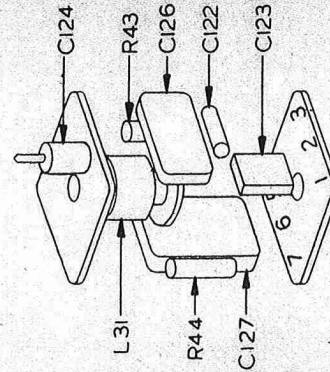
2ND IF COIL ASSEMBLY  
85 KC/S.



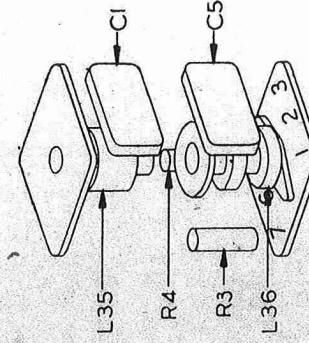
3RD IF COIL ASSEMBLY  
85 KC/S.



B.F.O. COIL ASSEMBLY



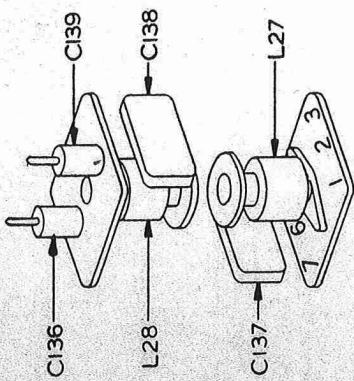
F.C. OSCILLATOR ASSEMBLY



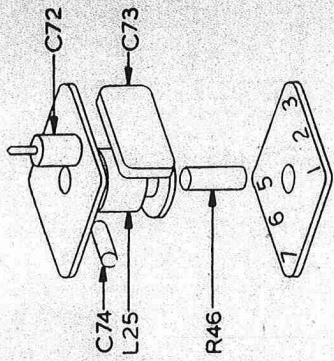
REJECTOR UNIT

NOTE. COMPONENT SYMBOLS REFER TO THOSE ON CIRCUIT DIAGRAM WZ3870 & COMPONENT LIST WZ3871/C.

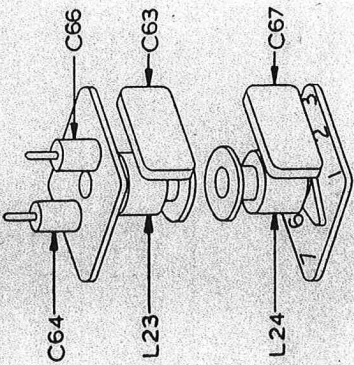
COMPONENT LOCATION (I.F. COIL UNITS) 'MERCURY' RECEIVER (TYPE 1017)



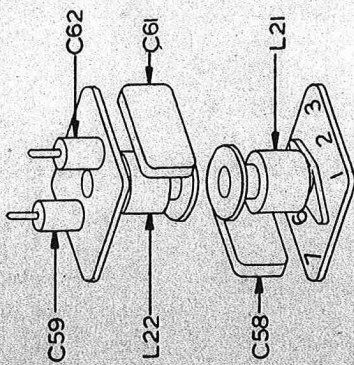
2ND IF COIL ASSEMBLY  
690 KC/S.



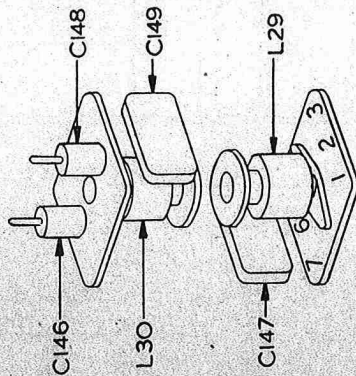
1ST IF COIL ASSEMBLY  
CIRCUIT C.



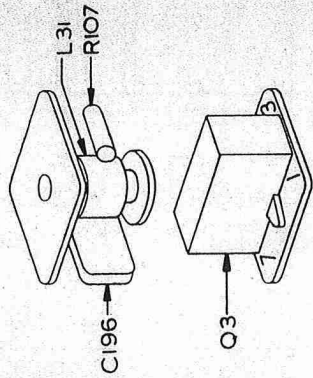
1ST IF COIL ASSEMBLY  
CIRCUIT B.



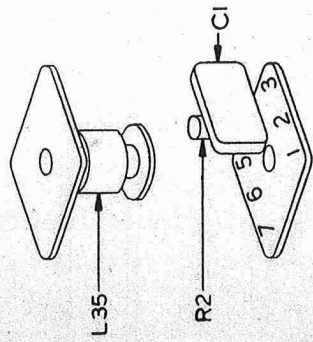
1ST IF COIL ASSEMBLY  
CIRCUIT A.



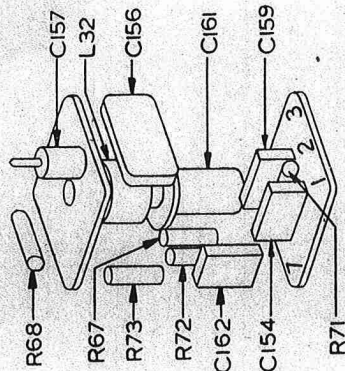
3RD IF COIL ASSEMBLY  
690 KC/S.



CRYSTAL CALIBRATOR



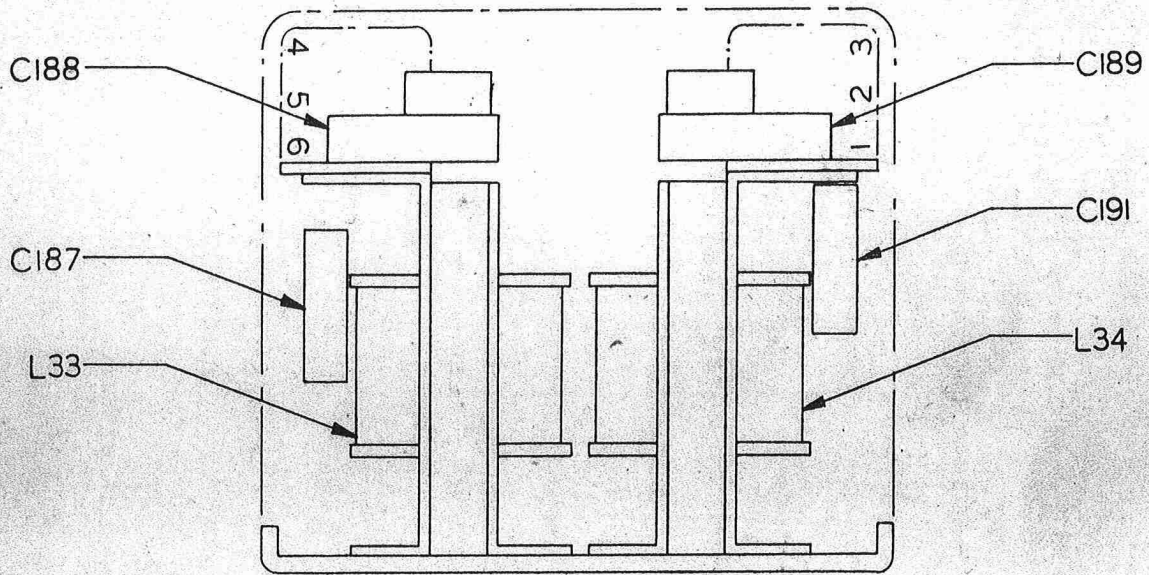
REJECTOR COIL ASSEMBLY



B.F.O. COIL ASSEMBLY

NOTE. COMPONENT SYMBOLS REFER TO THOSE ON CIRCUIT DIAGRAM WZ3872 & COMPONENT LIST WZ3873/C.

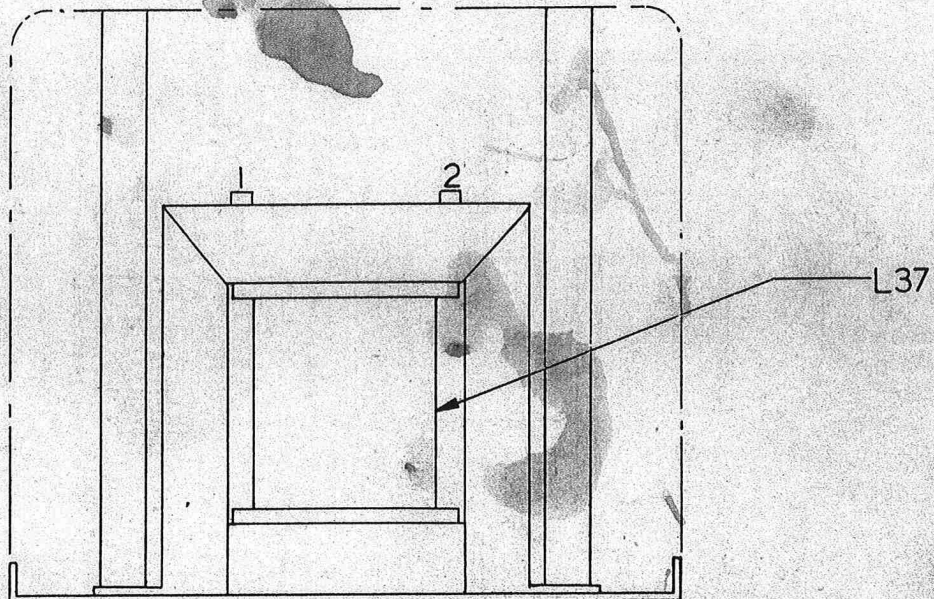




NOTE.

1. COMPONENT SYMBOLS REFER TO THOSE ON CIRCUIT DIAGRAMS WZ3870 & WZ3872. ALSO COMPONENT LISTS WZ3871/C & WZ3873/C.
2. TAGBOARDS PROJECTED TO SHOW TAG POSITIONS.

L.F. FILTER UNIT



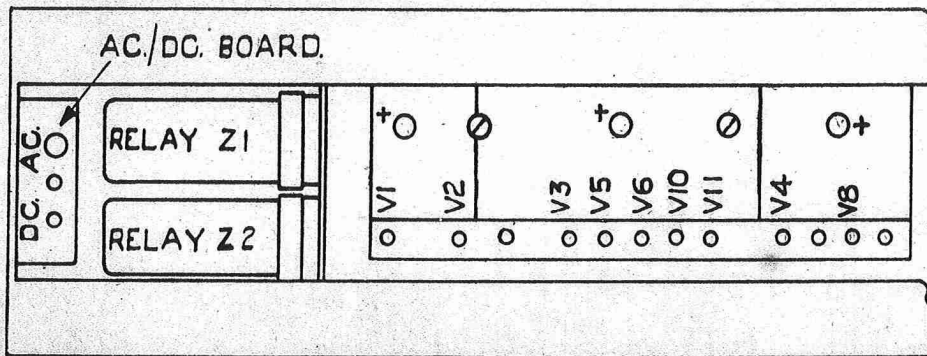
NOTE.

COMPONENT SYMBOL REFERS TO THAT ON CIRCUIT DIAGRAM WZ3870 & COMPONENT LIST WZ3871/C.

TYPE 1017 RECEIVER  
24V. INPUT CHOKE.

COMPONENT LOCATION (NOTE FILTER & MAINS FILTER)

W.Z.4264



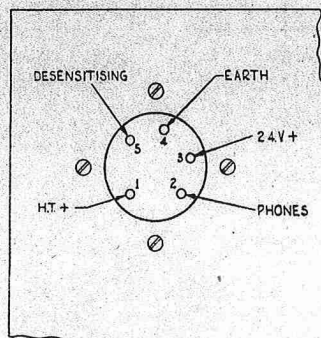
Issue No. 1  
Sheet No. 1

**VALVE FEED METERING BOARD**

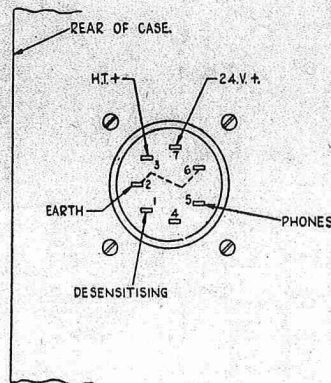
W.Z.4318

**MEASUREMENT OF VOLTAGES & VALVE FEEDS**

WHEN MEASURING VALVE FEEDS, ADVANCE ALL PANEL CONTROLS FULLY CLOCKWISE WITH THE EXCEPTION OF THE RANGE SWITCH. CONNECT THE POSITIVE SIDE OF THE METER TO THE + POINT IN THE DESIRED SECTOR, AND THE NEGATIVE POINT TO THE APPROPRIATE TAG.

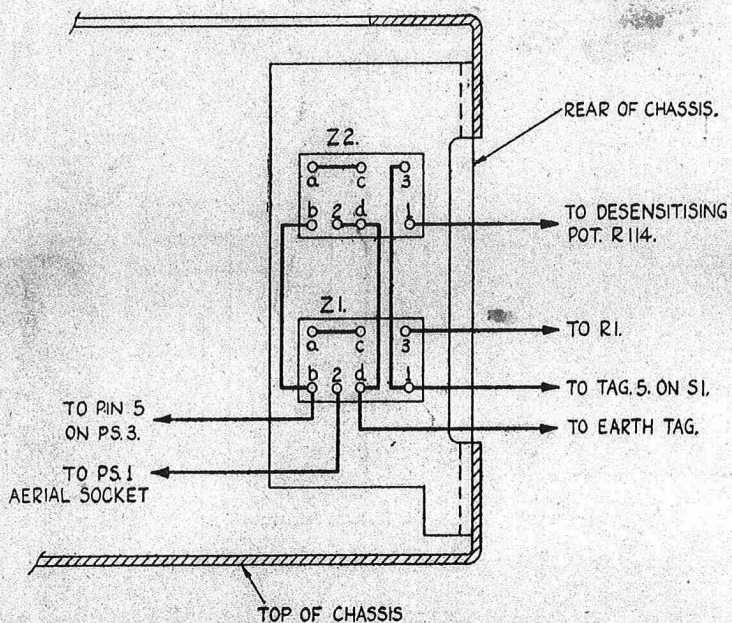


PLAN VIEW OF RECEIVER CHASSIS SOCKET PS.3.

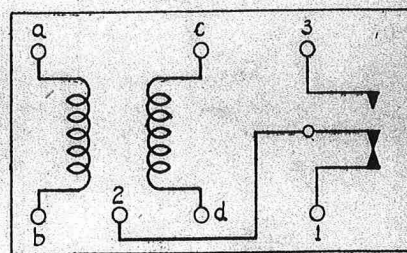


VIEW OF RECEIVER CASE SOCKET PS.2.

POWER SOCKET CONNECTIONS.



PART CROSS SECTION OF CHASSIS SHOWING CONNECTIONS TO RELAYS.



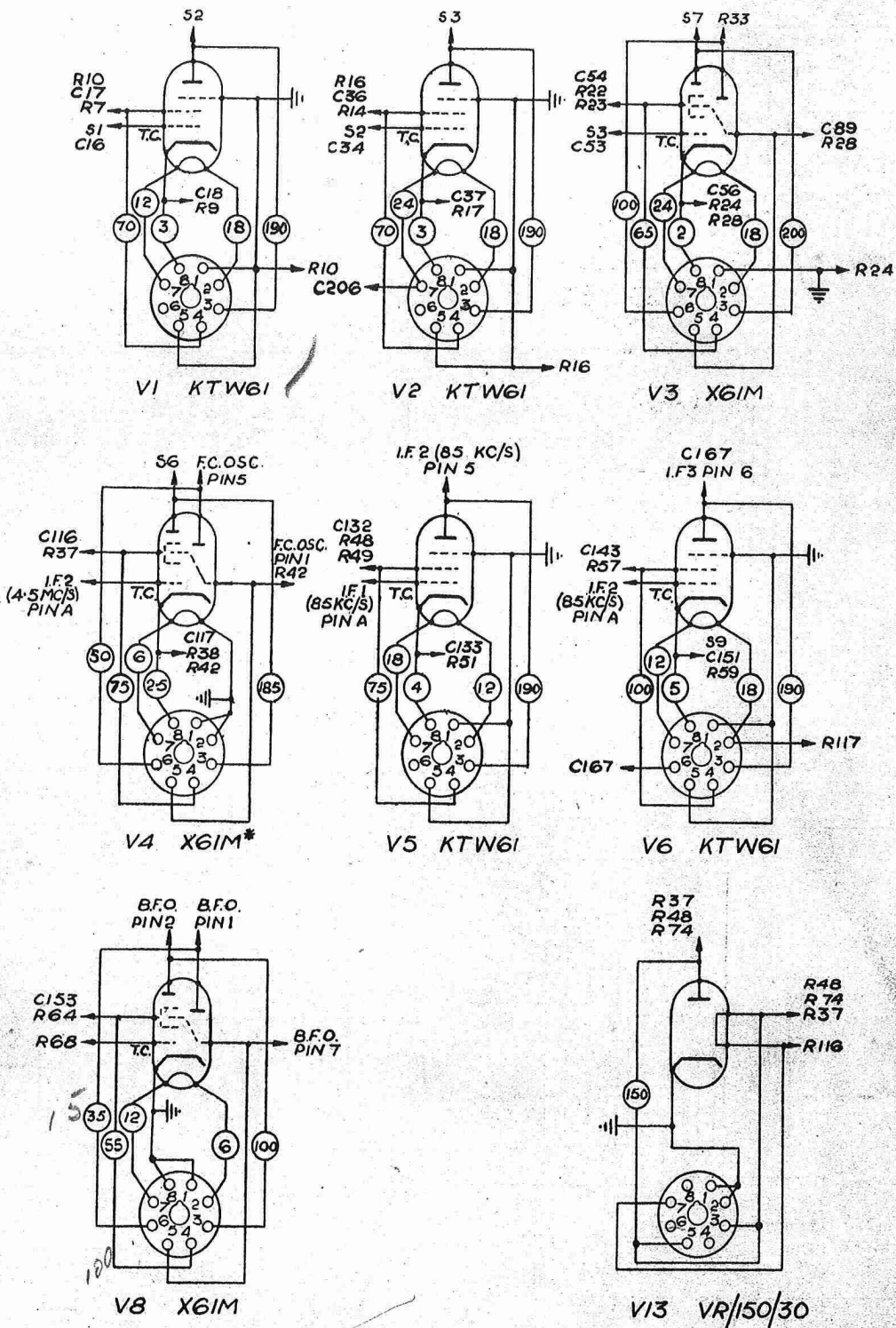
INTERNAL CONNECTIONS OF RELAYS.

AERIAL RELAY CONNECTIONS.

**CONNECTIONS TO AERIAL CIRCUIT RELAY**

W.Z.4267

Issue No. 1  
Sheet No. 1



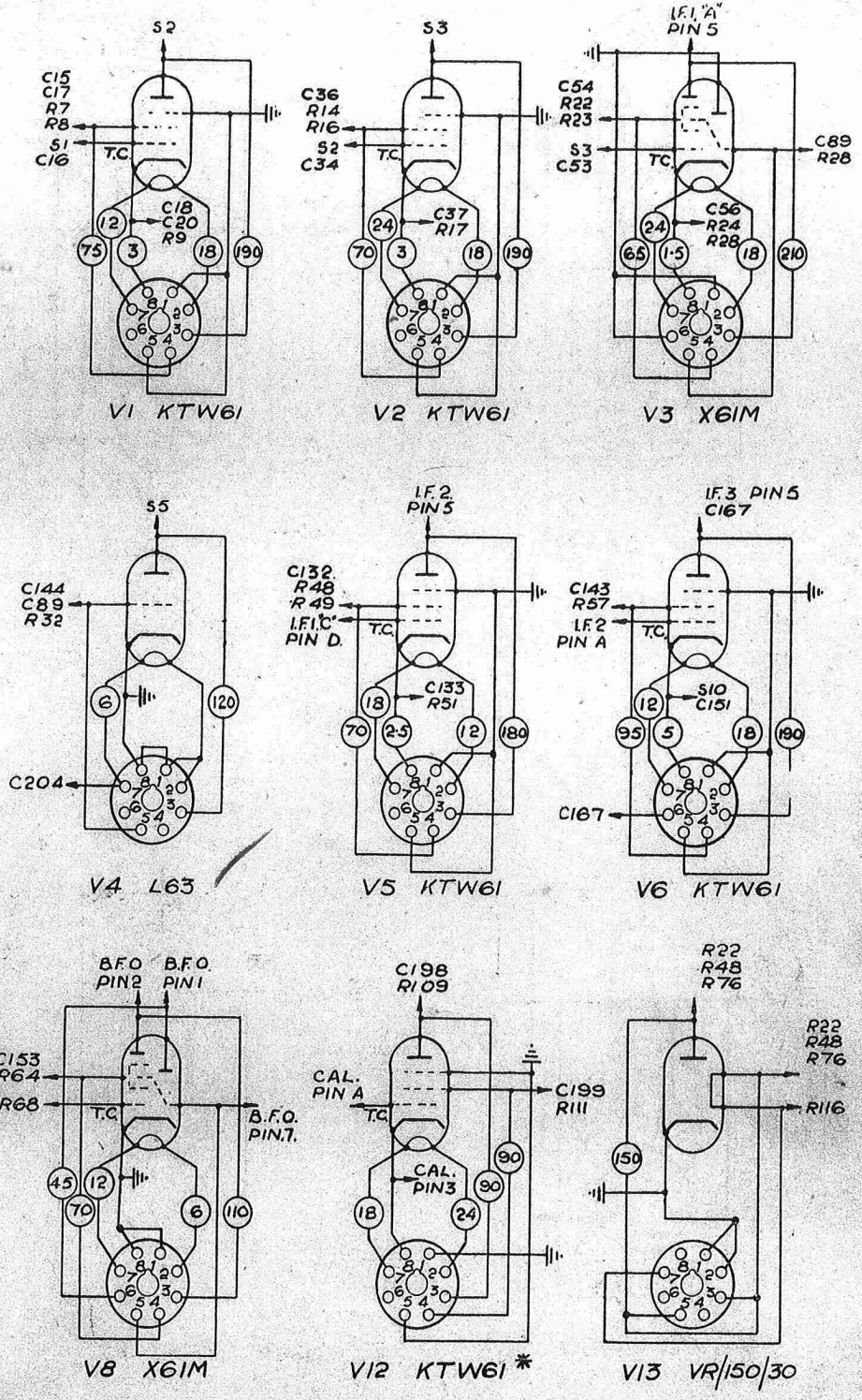
**NOTES.**

1. MEASUREMENTS TAKEN ON RANGE 2 WITH SYSTEM SWITCH AT "CW" & PASSBAND SWITCH AT "NARROW".
- \* 2. RANGE SWITCH AT "4" FOR V.A.
3. VOLTAGES MEASURED WITH RESPECT TO EARTH USING A HIGH RESISTANCE VOLTMETER & WITH GAIN CONTROLS FULLY CLOCKWISE.

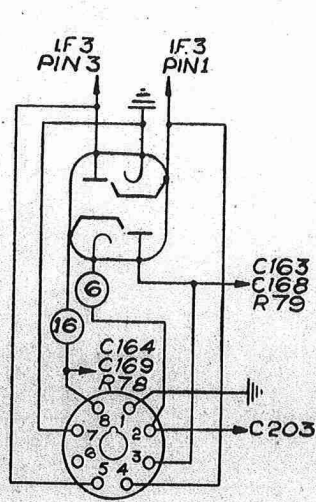
Sheet No. 1 (continued on 2)

W.Z.4256/B

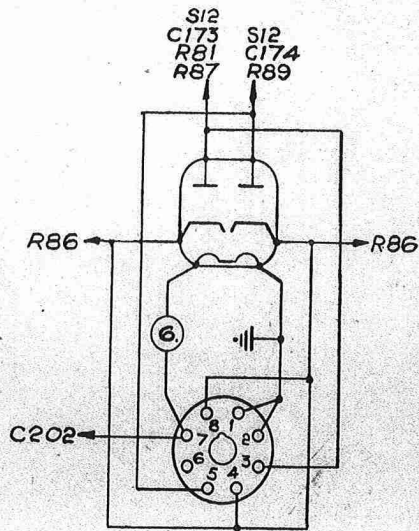
**VALVE BASE CONNECTIONS FOR 'MERCURY' RECEIVER (TYPE 1017)**



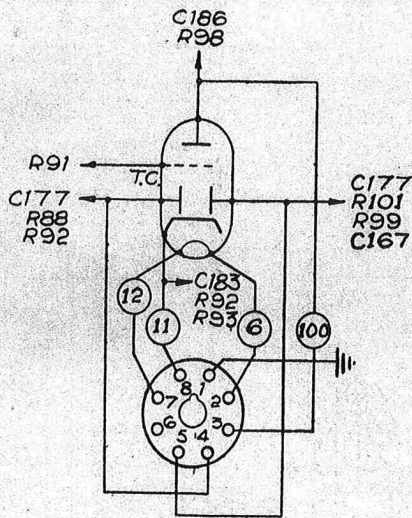
- NOTES.
1. MEASUREMENTS TAKEN ON RANGE 2 WITH SYSTEM SWITCH AT "CW" & PASSBAND SWITCH AT "NARROW".
  - \* 2. SYSTEM SWITCH AT "SCALE CHECK" FOR V12.
  3. VOLTAGES MEASURED WITH RESPECT TO EARTH USING A HIGH RESISTANCE VOLTMETER & WITH GAIN CONTROLS FULLY CLOCKWISE.



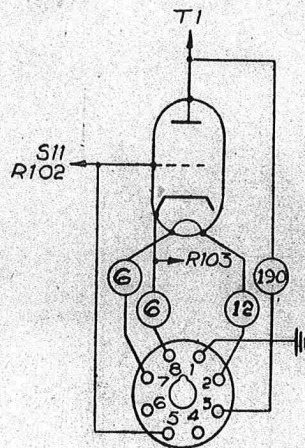
V7 D63M\*



V9 D63M



V10 DH63



V11 L63

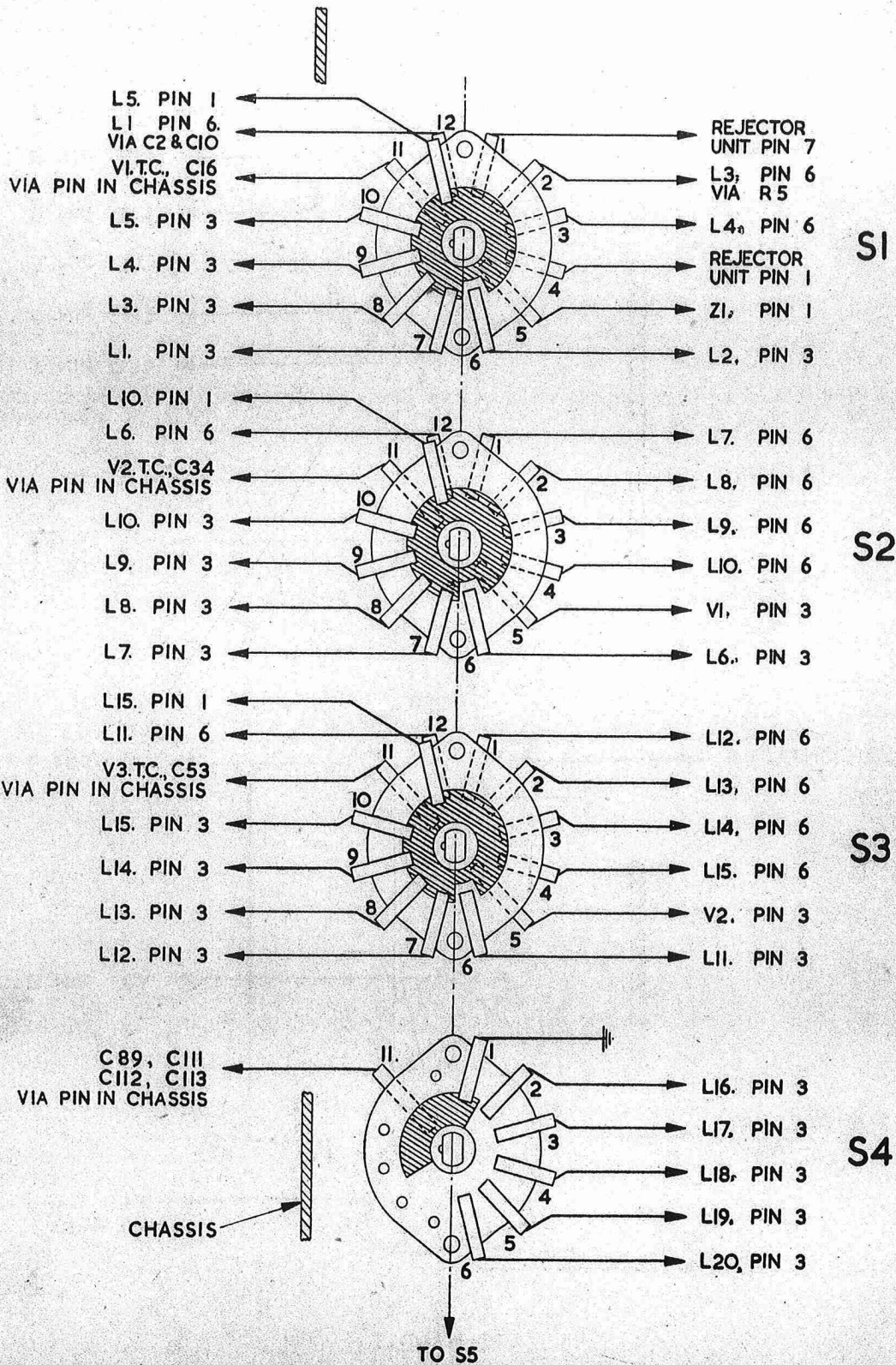
**NOTES.**

1. MEASUREMENTS TAKEN ON RANGE 2 WITH SYSTEM SWITCH AT 'CW' & PASSBAND SWITCH AT 'NARROW'
- \* 2. SYSTEM SWITCH AT 'PHONE' FOR V7
3. VOLTAGES MEASURED WITH RESPECT TO EARTH USING A HIGH RESISTANCE VOLTMETER & WITH GAIN CONTROLS FULLY CLOCKWISE.

Sheet No. 2 (continued on 3)

W.Z.4256/B

**VALVE BASE CONNECTIONS FOR RECEIVERS (TYPE 1017 & 1018)**

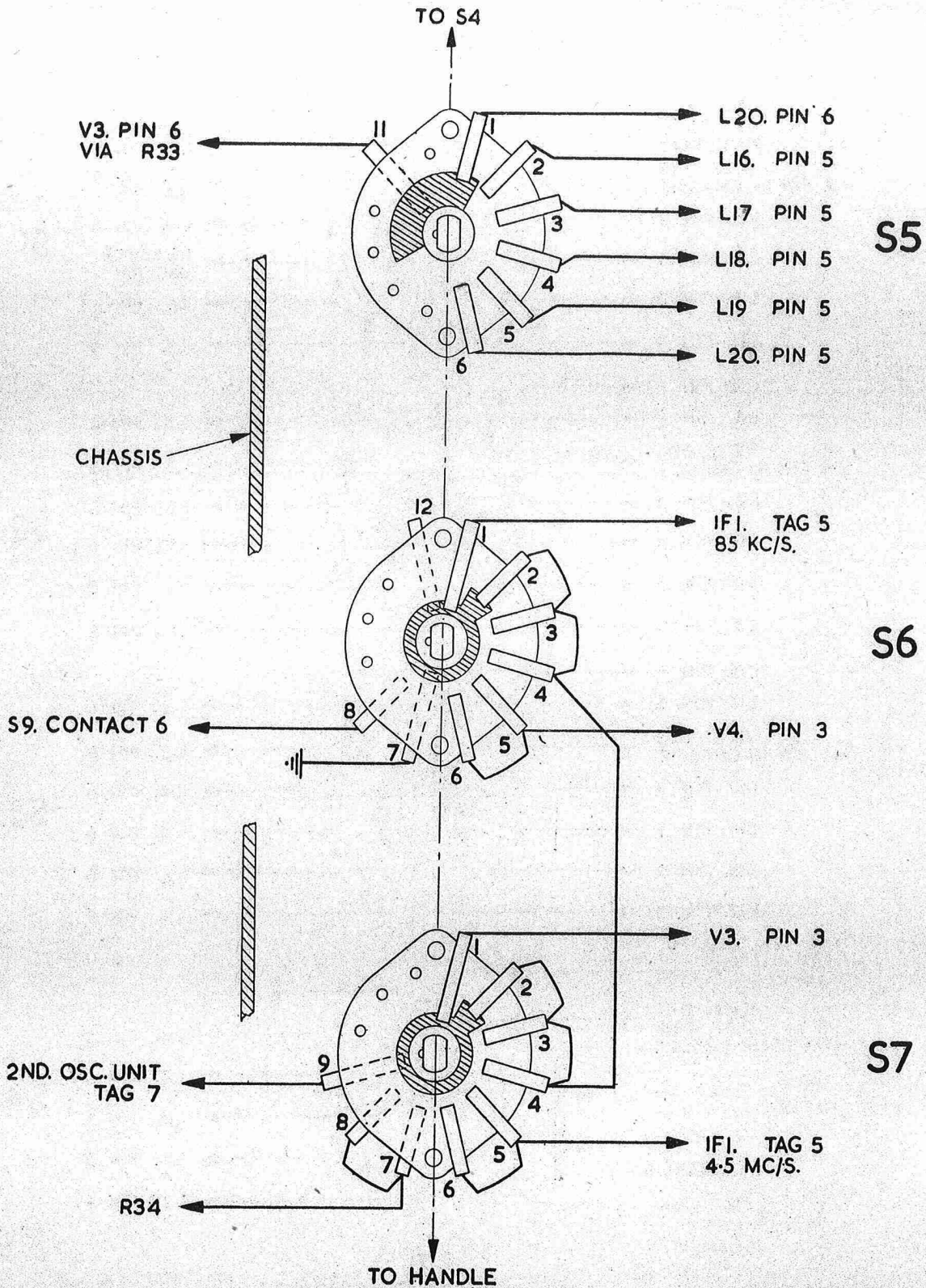


**NOTE** SWITCHES SHOWN IN FULL COUNTER CLOCKWISE POSITION & ARE VIEWED FROM DRIVING END.

Issue No. 1  
Sheet No. 1 (continued on 2)

W.Z.4255

ROTARY SWITCH CONNECTIONS—'MERCURY' RECEIVER (Type 1017)



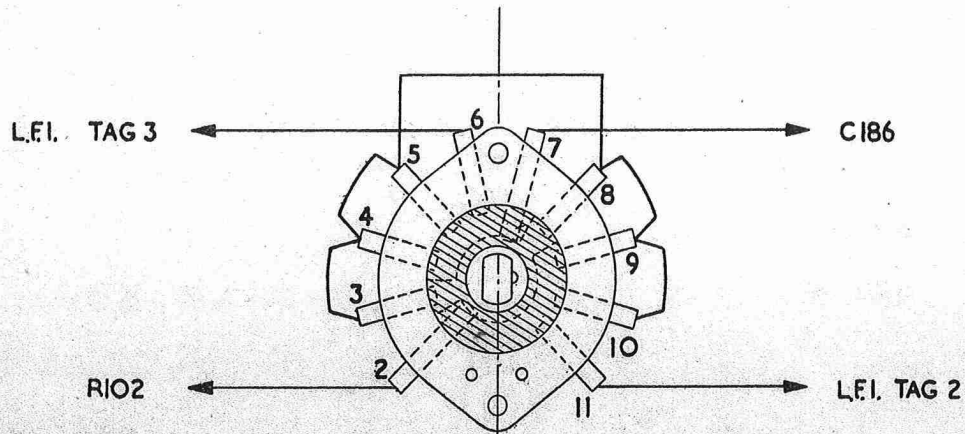
**NOTE**

SWITCHES SHOWN IN FULL COUNTER CLOCKWISE POSITION & ARE VIEWED FROM DRIVING END.

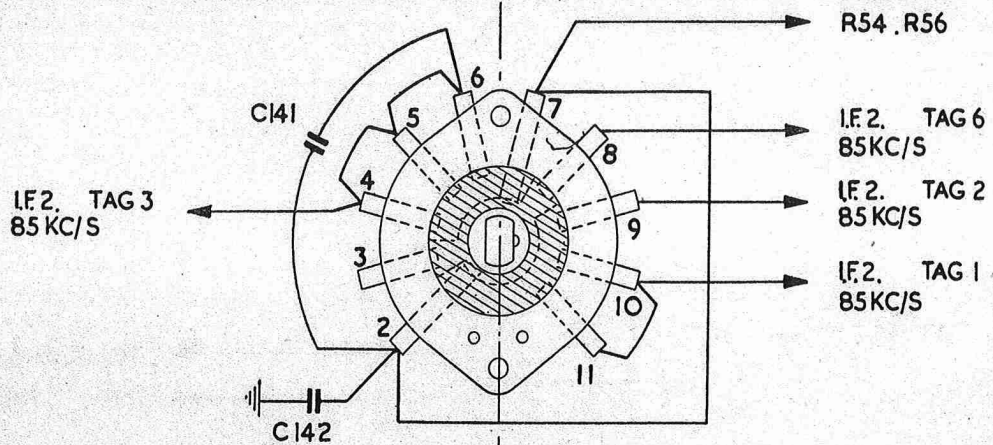
Issue No. 1  
Sheet No. 2 (continued on 3)

W.Z.4255

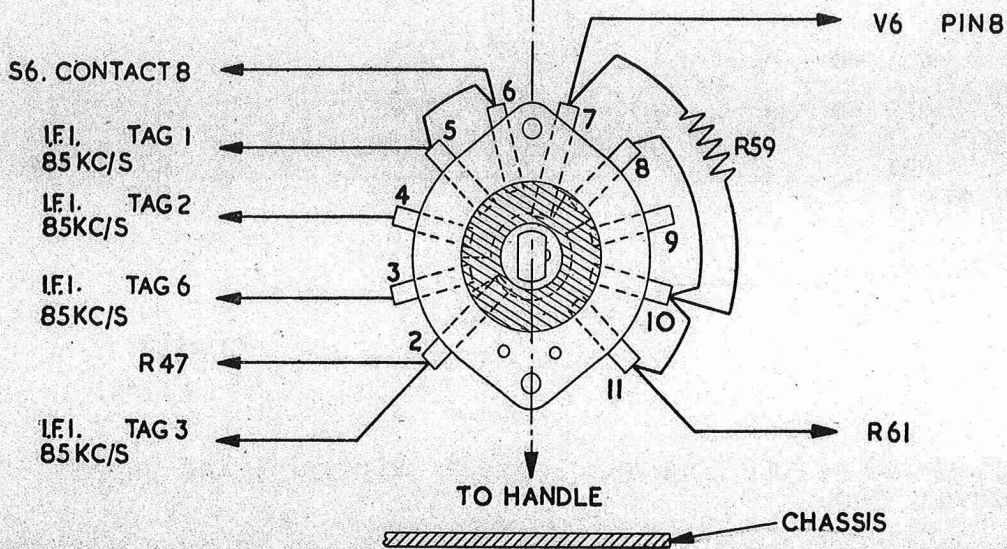
**ROTARY SWITCH CONNECTIONS 'MERCURY' RECEIVER (TYPE 1017)**



SII



SIO



S9

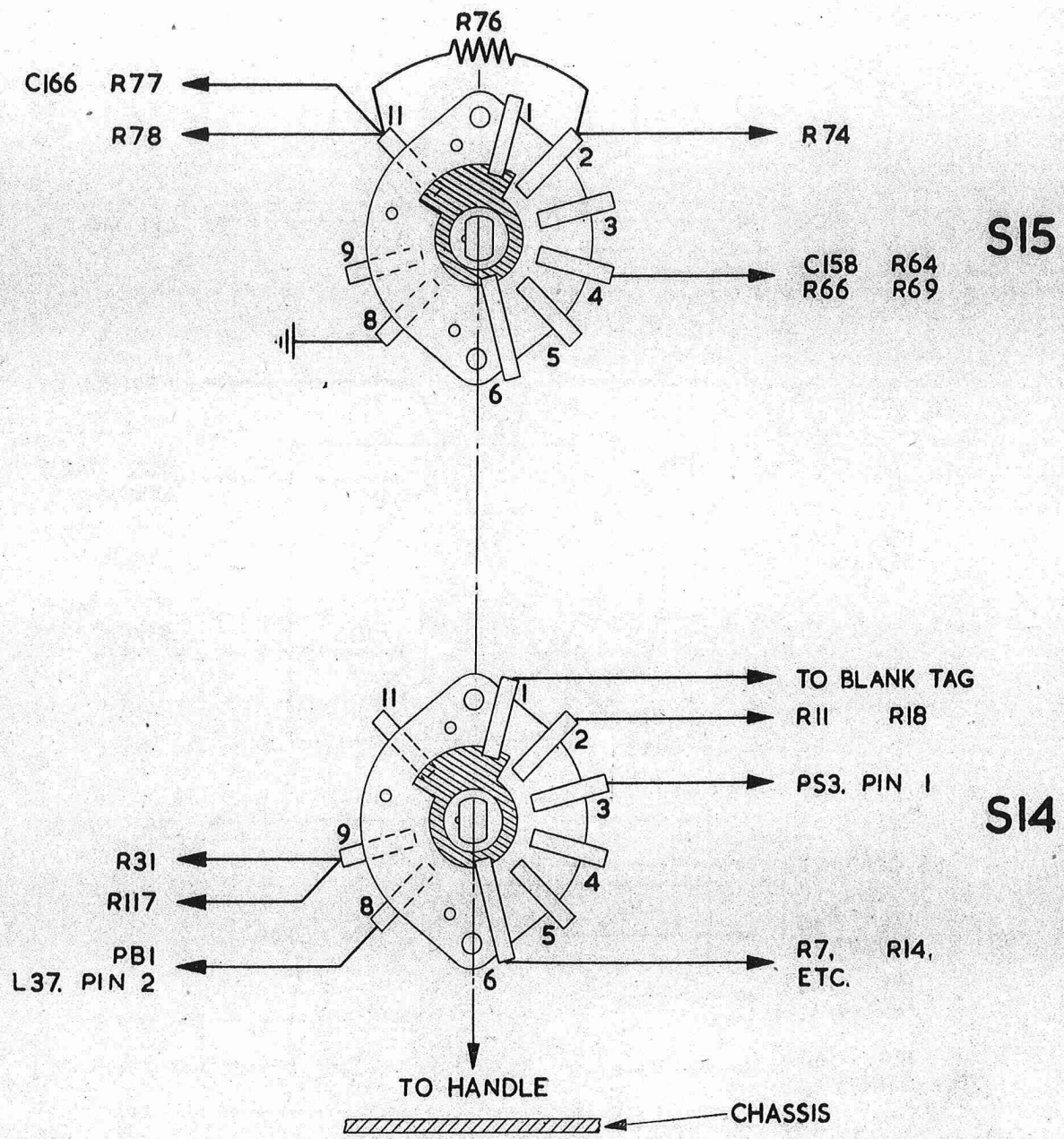
**NOTE** SWITCHES SHOWN IN FULL COUNTER CLOCKWISE POSITION & ARE VIEWED FROM DRIVING END.

Issue No. 1  
Sheet No. 3 (continued on 4)

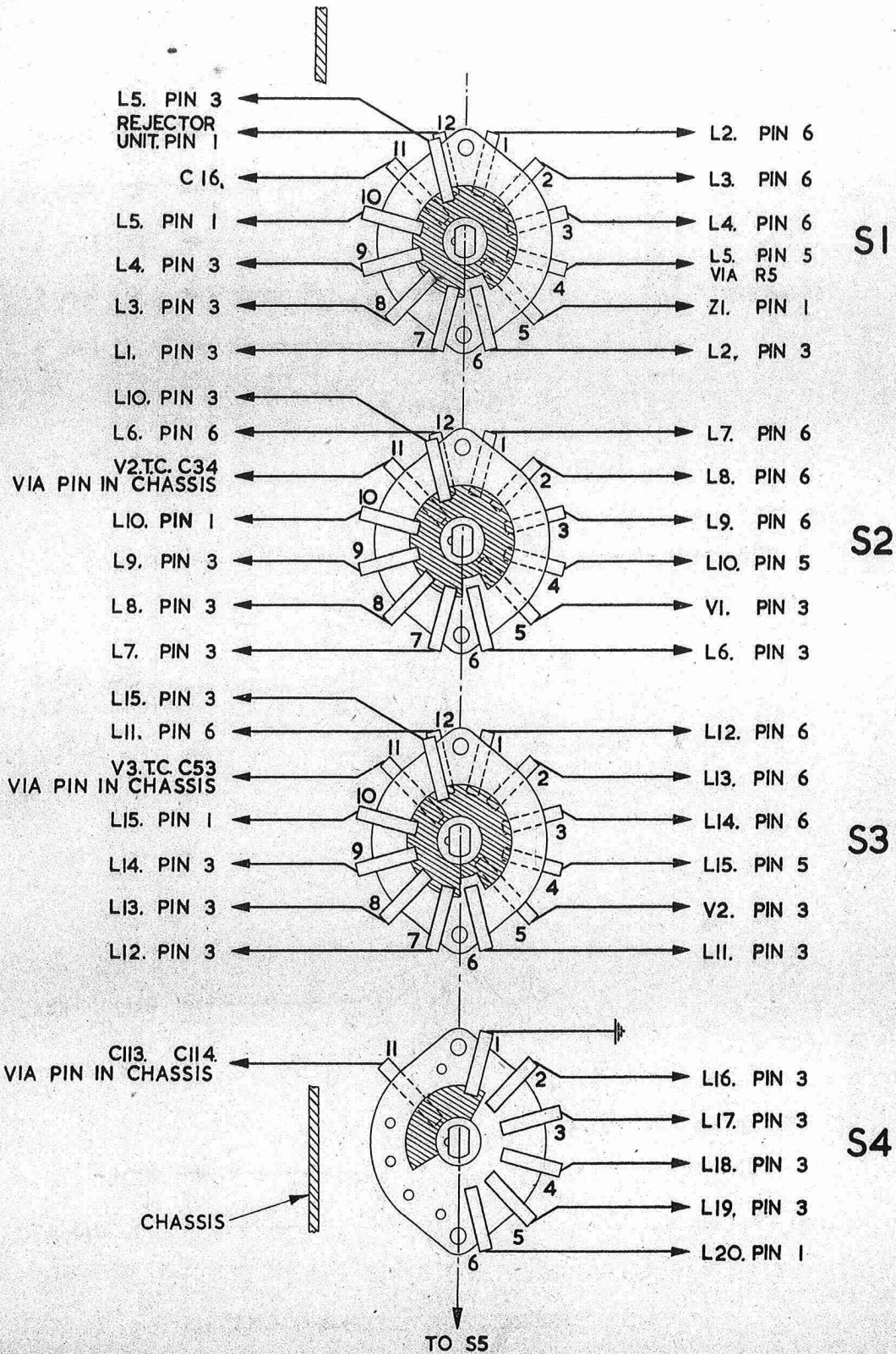
W.Z.4255

ROTARY SWITCH CONNECTIONS 'MERCURY' RECEIVER (TYPE 1017)





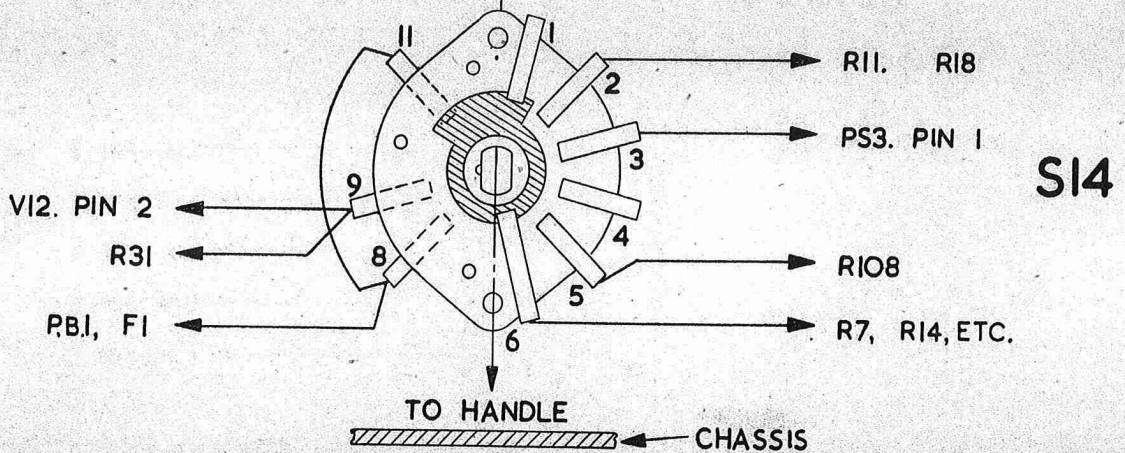
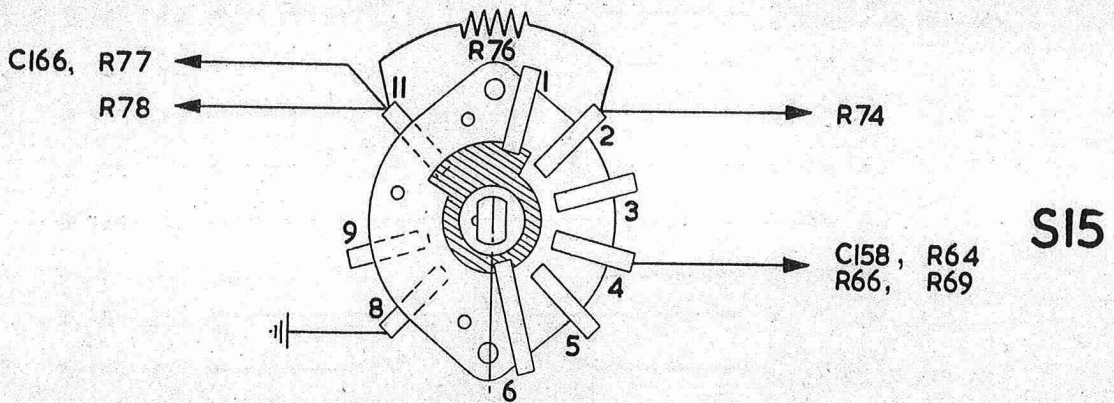
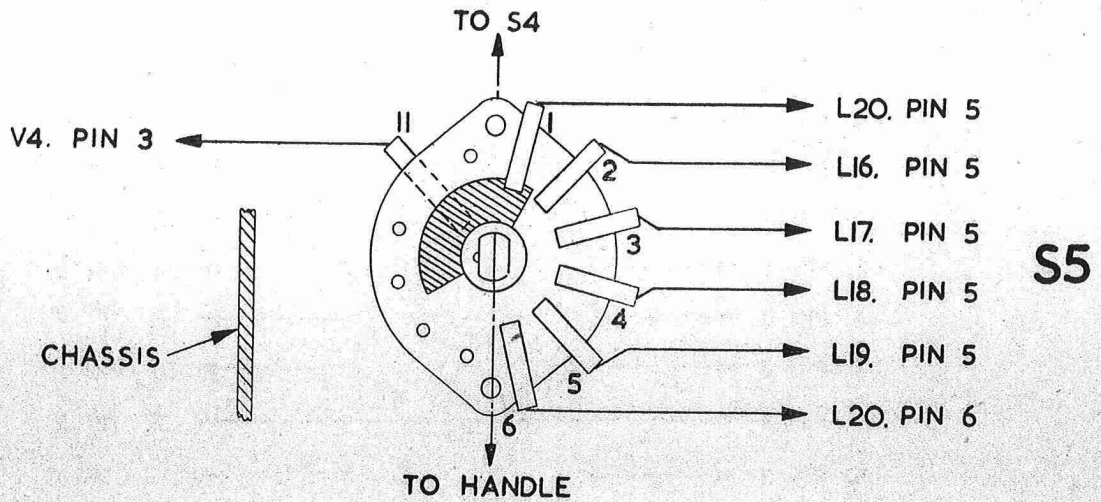
**NOTE** SWITCHES SHOWN IN FULL COUNTER CLOCKWISE POSITION & ARE VIEWED FROM DRIVING END.



**NOTE**  
 SWITCHES SHOWN IN FULL COUNTER CLOCKWISE POSITION & ARE VIEWED FROM DRIVING END.

Issue No. 1  
 Sheet No. 1 (continued on 2)

W.Z.4254  
 ROTARY SWITCH CONNECTIONS 'ELECTRA' RECEIVER (TYPE 1018)



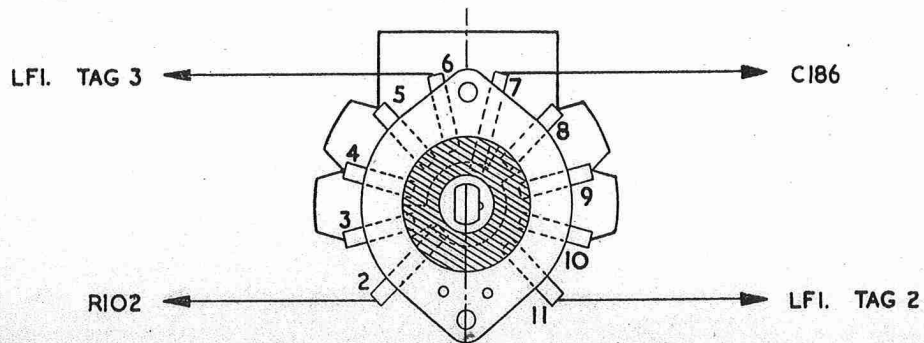
**NOTE**

SWITCHES SHOWN IN FULL COUNTER CLOCKWISE POSITION & ARE VIEWED FROM DRIVING END.

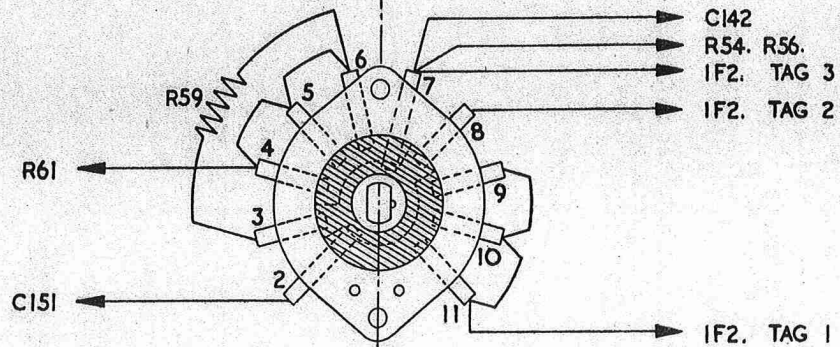
Issue No. 1  
Sheet No. 2 (continued on 3)

W.Z.4254

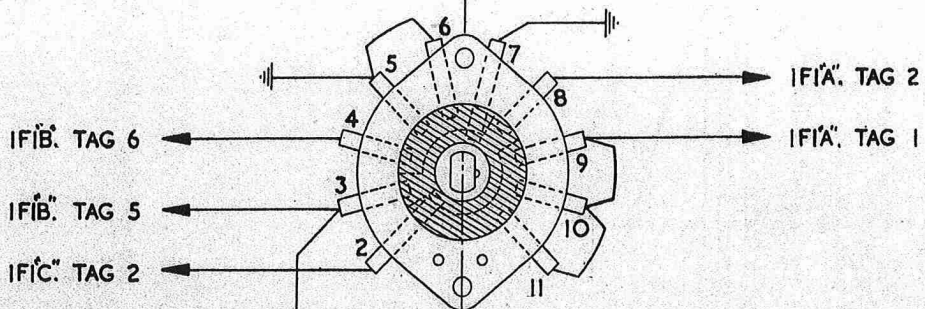
**ROTARY SWITCH CONNECTIONS 'ELECTRA' RECEIVER (TYPE 1018)**



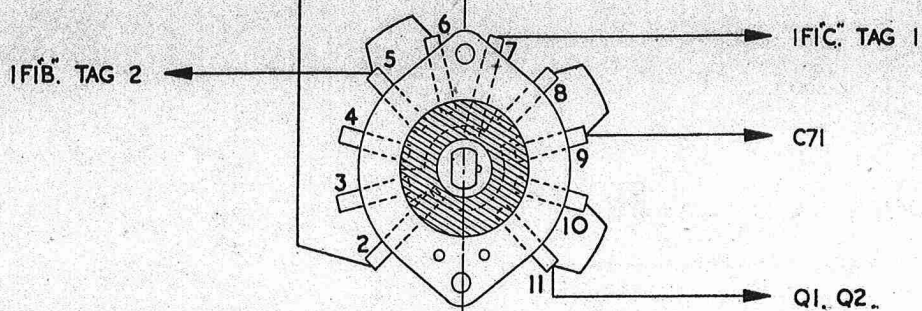
S11



S10



S8



S9

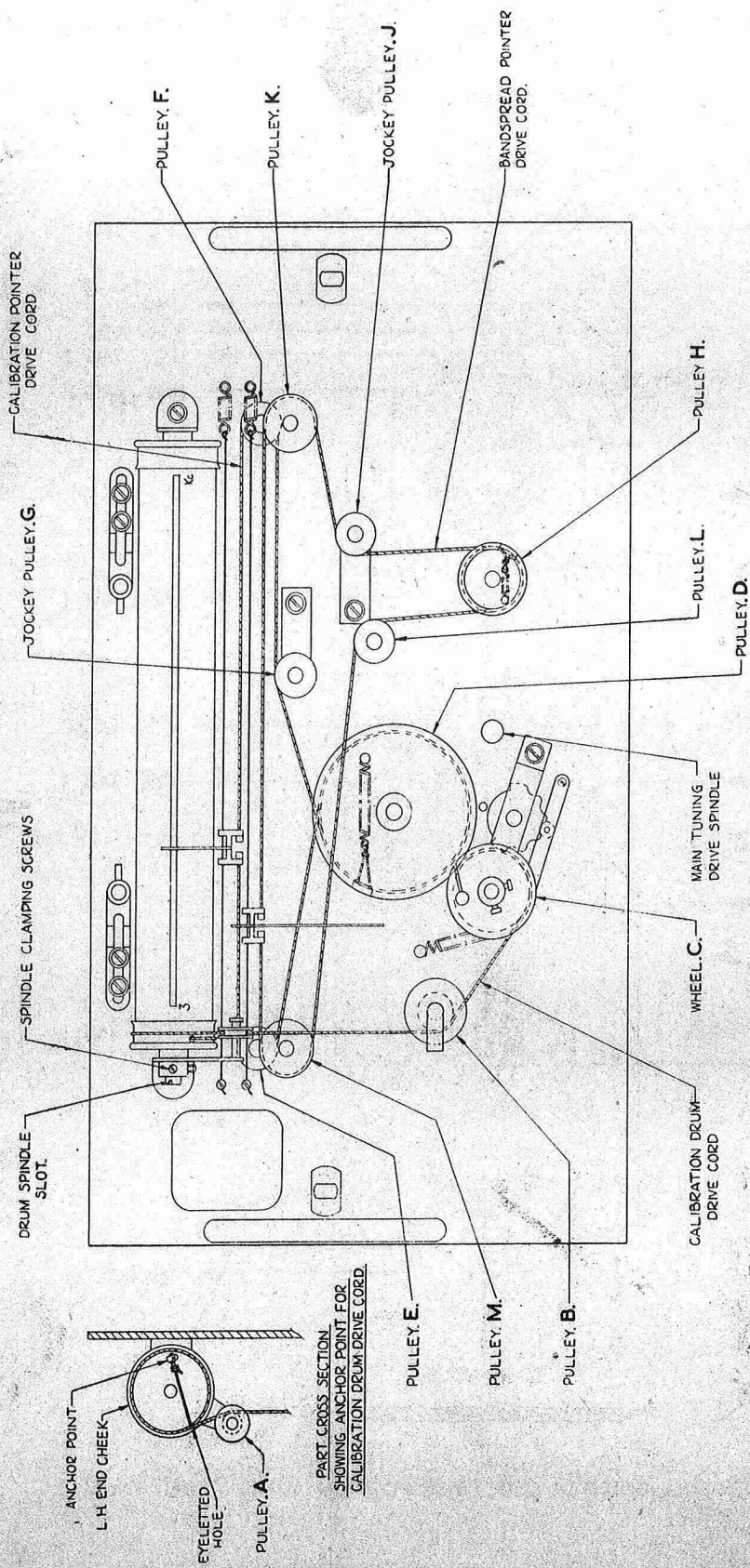


**NOTE**  
SWITCHES SHOWN IN FULL COUNTER CLOCKWISE POSITION & ARE VIEWED FROM DRIVING END.

Issue No. 1  
Sheet No. 3

W.Z.4254

ROTARY SWITCH CONNECTIONS—'ELECTRA' RECEIVER (Type 1018)



FRONT PANEL WITH COVER REMOVED.

Issue No. 1  
Sheet No. 1

W.Z.4258

DRIVE CORD REPLACEMENT DIAGRAMS FOR 'MERCURY' (TYPE 1017) AND 'ELECTRA' (TYPE 1018) RECEIVERS

**COMPONENT SCHEDULE**  
**'MERCURY' RECEIVER (Type 1017)**

*Symbols C1, C2 etc. correspond to those on Circuit Diagram WZ.3870/D, and on Component Location Drawings.*

*When Ordering Spares, Quote Ref. No., Value and Drawing No., e.g. C1-470pF  $\pm$  5% WIS.185 Sh. 1.*

Ref.	Description	Value	Drawing No.	Remarks
	<b>CONDENSERS</b>			
C1	Condenser	470pF $\pm$ 5%	WIS.185 Sh. 1.	Dubilier Type S690W
C2	Condenser	.0001 $\mu$ F $\pm$ 15%	WIS.2442	Dubilier Type 635
C3	Condenser	22pF $\pm$ 10%	WIS.3450/B Sh. 1. Ref. 1	Erie Ceramicon Type N750K
C4	Condenser	15pF $\pm$ 10%	WIS.3450/B Sh. 1. Ref. 7	Erie Ceremicon Type P120K
C5	Condenser	470pF $\pm$ 5%	WIS.185 Sh. 1.	Dubilier Type S690W
C6	Condenser	10pF $\pm$ 10%	WIS.3450/B Sh. 1. Ref. 1	Erie Ceremicon Type N750K
C7	Condenser	22pF $\pm$ 10%	WIS.3450/B Sh. 1. Ref. 1	Erie Ceramicon Type N750K
C8	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1.	
C9	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1	
C10	Condenser	.0001 $\mu$ F $\pm$ 15%	WIS.2442	Dubilier Type 635
C11	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1	
C12	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1	
C13	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1	
C14	Condenser	.01 $\mu$ F $\pm$ 10%	WIS.1565 Sh. 2	Dubilier Type S691W
C15				
C16	Condenser Variable	532pF.	WIS.4159/C Sh. 1. Ref. 1	Sweep with C34 C53 & C113
C17	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal Pack Type CP.45N
C18	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal Pack Type CP.45N
C19	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal Pack Type CP.45N
C20				
C21	Condenser	10pF $\pm$ 10%	WIS.3450/B Sh. 1. Ref. 7	Erie Ceramicon Type P120K
C22	Condenser	22pF $\pm$ 10%	WIS.3450/B Sh. 1. Ref. 1	Erie Ceramicon Type N750K
C23	Condenser	22pF $\pm$ 10%	WIS.3450/B Sh. 1. Ref. 1	Erie Ceramicon Type N750K

Ref.	Description	Value	Drawing No.	Remarks
C24	Condenser	22pF $\pm$ 10%	WIS.3450/B Sh. 1. Ref. 1	Erie Ceramicon Type N750K
C25	Condenser	22pF $\pm$ 10%	WIS.3450/B Sh. 1. Ref. 1	Erie Ceramicon Type N750K
C26				
C27	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1	
C28	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1	
C29	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1	
C30	Condenser Spiral Trimmer	3-30 pF	WIS.2848 Sh. 1. Ref. 1	
C31				
C32	Condenser Spiral Trimmer	3-30 pF	WIS.2848 Sh. 1. Ref. 1.	
C33	Condenser	.01 $\mu$ F $\pm$ 10%	WIS.1565 Sh. 2.	Dubilier Type S691W
C34	Condenser Variable	532pF	WIS.4159/C Sh. 1. Ref. 1.	Sweep with C16, C53 & C113
C35	Condenser	0.1 $\mu$ F $\pm$ 20% 350V Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal Pack Type CP.45N
C36				
C37	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal Pack Type CP.45N
C38	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal Pack Type CP.45N
C39	Condenser	10pF $\pm$ 10%	WIS.3450/B Sh. 1. Ref. 7	Erie Ceramicon Type P120K
C40	Condenser	22pF $\pm$ 10%	WIS.3450/B Sh. 1. Ref. 1	Erie Ceramicon Type N750K
C41				
C42	Condenser	22pF $\pm$ 10%	WIS.3450/B Sh. 1. Ref. 1.	Erie Ceramicon Type N750K
C43	Condenser	22pF $\pm$ 10%	WIS.3450/B Sh. 1. Ref. 1.	Erie Ceramicon Type N750K
C44	Condenser	22pF $\pm$ 10%	WIS.3450/B Sh. 1. Ref. 1.	Erie Ceramicon Type N750K
C45	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1	
C46				
C47	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1.	
C48	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1.	
C49	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1.	
C50	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1.	
C51				
C52	Condenser	.01 $\mu$ F $\pm$ 10%	WIS.1565 Sh. 2	Dubilier Type S691W

Ref.	Description	Value	Drawing No.	Remarks
C53	Condenser Variable	532 pF	WIS.4159/C Sh. 1. Ref. 1	Sweep with C16, C34, C113
C54	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal Pack Type CP.45N
C55				
C56	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal Pack Type CP.45N
C57	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal Pack Type CP.45N
C58	Condenser	220pF $\pm$ 5%	WIS.185 Sh. 1	Dubilier Type S690W
C59	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1	
C60				
C61				
C62				
C63				
C64				
C65				
C66				
C67				
C68				
C69				
C70				
C71				
C72				
C73				
C74				
C75				
C76	Condenser	2.2pF $\pm$ .25pF	WIS.3450/B Sh. 1. Ref. 7	Erie Ceramicon Type P120K
C77	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1	
C78	Condenser	220pF $\pm$ 5%	WIS.185 Sh. 1	Dubilier Type S690W
C79	Condenser	220pF $\pm$ 5%	WIS.185 Sh. 1	Dubilier Type S690W
C80				
C81	Condenser	.01 $\mu$ F $\pm$ 10%	WIS.1565 Sh. 2	Dubilier Type S691W
C82	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1	
C83	Condenser	2.2pF $\pm$ .25pF	WIS.3450/B Sh. 1. Ref. 7	Erie Ceramicon Type P120K
C84	Condenser	220pF $\pm$ 5%	WIS.185 Sh. 1	Dubilier Type S690W
C85				
C86	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1	
C87				
C88	Condenser	.01 $\mu$ F $\pm$ 10%	WIS.1565 Sh. 2	Dubilier Type S691W



Ref.	Description	Value	Drawing No.	Remarks
C89	Condenser	.0001 $\mu$ F $\pm$ 15%	WIS.2442	Dubilier Type 635
C90	Condenser	100pF $\pm$ 2%	WIS.185	Dubilier Type S690W
C91			Sh. 1	
C92	Condenser	650pF $\pm$ 2%	WIS.185	Dubilier Type S690W
C93			Sh. 1	
C94	Condenser	1600pF $\pm$ 2%	WIS.1565	Dubilier Type S691W
C95			Sh. 2	
C96	Condenser	82pF $\pm$ 2%	WIS.185	Dubilier Type S690W
C97			Sh. 1	
C98	Condenser Spiral Trimmer	200pF $\pm$ 2%	WIS.185	Dubilier Type S690W
C99			Sh. 1	
C100	Condenser Spiral Trimmer	3-30pF	WIS.2848	
C101			Sh. 1. Ref. 1	
C102	Condenser Spiral Trimmer	3-30pF	WIS.2848	
C103			Sh. 1. Ref. 1	
C104	Condenser	3-30pF	WIS.2848	Erie Ceramicon Type N750K
C105			Sh. 1. Ref. 1	
C106	Condenser	47pF $\pm$ 10%	WIS3450/B	Erie Ceramicon Type N.750K
C107			Sh. 1. Ref. 1	
C108	Condenser	33pF $\pm$ 10%	WIS.3450/B	Erie Ceramicon Type N750K
C109			Sh. 1. Ref. 1	
C110	Condenser Spiral Trimmer	22pF $\pm$ 10%	WIS.3450/B	Erie Ceramicon Type N750K
C111			Sh. 1. Ref. 1.	
C112	Condenser	33pF $\pm$ 10%	WIS.3450/B	Erie Ceramicon Type N750K
C113			Sh. 1. Ref. 1	
C114	Condenser Variable	47pF $\pm$ 10%	WIS.3450/B	Erie Ceramicon Type N750K
C115			Sh. 1. Ref. 1.	
C116	Condenser	33pF $\pm$ 10%	WIS.3450/B	Erie Ceramicon Type N750K
C117			Sh. 1. Ref. 1.	
C118	Condenser Spiral Trimmer	2-8pF	WIS.2848	Temperature Compensator Sweep with C16, C34 & C53
C119			Sh. 1. Ref. 2	
C120	Condenser	532pF	W.20369/C	
C121			Sh. 1. ED.A	
C122	Condenser Variable	532pF	WIS.4159/C	
C123			Sh. 1. Ref. 1	
C124	Condenser	.01 $\mu$ F $\pm$ 20%	WIS.3955/C	T.C.C. Metal pack Type CP45N
C125			Sh. 1. Ref. 7A	
C126	Condenser	350V. Wkg	WIS.3955/C	T.C.C. Metal pack Type CP45N
C127			Sh. 1. Ref. 7A	
C128	Condenser	0.1 $\mu$ F $\pm$ 20%	WIS.3955/C	
C129			Sh. 1. Ref. 7A	
C130	Condenser	350V. Wkg	WIS.3955/C	
C131			Sh. 1. Ref. 7A	

Ref.	Description	Value	Drawing No.	Remarks
C118	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP45N
C119	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1	
C120	Condenser	470pF $\pm$ 5%	WIS.185 Sh. 1.	Dubilier Type S690W
C121	Condenser	33pF $\pm$ 10%	WIS.3450/B Sh. 1. Ref. 1	Erie Ceramicon Type N750K
C122	Condenser	100pF $\pm$ 15%	WIS.2442	Dubilier Type 635
C123	Condenser Spiral Trimmer	2-8 pF	WIS.2848 Sh. 1. Ref. 2	
C124	Condenser	220pF $\pm$ 5%	WIS.185 Sh. 1.	Dubilier Type S690W
C125	Condenser	.01 $\mu$ F $\pm$ 10% 350V Wkg	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C126	Condenser	470 $\pm$ 5%	WIS.189 Sh. 1.	Dubilier Type S690W
C127	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1	
C128	Condenser	0.1 $\mu$ F $\pm$ 20% 350V Wkg	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C129	Condenser	0.1 $\mu$ F $\pm$ 20% 350V Wkg	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C130	Condenser	0.1 $\mu$ F $\pm$ 20% 350V Wkg	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C131	Condenser	0.1 $\mu$ F $\pm$ 20% 350V Wkg	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C132	Condenser	0.1 $\mu$ F $\pm$ 20% 350V Wkg	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C133	Condenser	0.1 $\mu$ F $\pm$ 20% 350V Wkg	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C134	Condenser	0.1 $\mu$ F $\pm$ 20% 350V Wkg	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C135	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1	
C136	Condenser	470pF $\pm$ 5%	WIS.185 Sh. 1.	Dubilier Type S.690W
C137	Condenser	470pF $\pm$ 5%	WIS.185 Sh. 1.	Dubilier Type S690W
C138	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1	
C139	Condenser	.01 $\mu$ F $\pm$ 10%	WIS.1565 Sh. 2	Dubilier Type S.691W
C140	Condenser	0.1 $\mu$ F $\pm$ 20%	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C141	Condenser	0.1 $\mu$ F $\pm$ 20% 350V Wkg	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C142	Condenser	0.1 $\mu$ F $\pm$ 20% 350V Wkg	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C143	Condenser	0.1 $\mu$ F $\pm$ 20% 350V Wkg	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C144	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1	

Ref.	Description	Value	Drawing No.	Remarks
C147	Condenser	470pF $\pm$ 5%	WIS.185 Sh. 1	Dubilier Type S690W
C148	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1	
C149	Condenser	470pF $\pm$ 5%	WIS.185	Dubilier Type S690W
C150				
C151	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C152	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C153	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C154	Condenser	500pF $\pm$ 15%	WIS.2422	Dubilier Type 635
C155	Condenser	500pF $\pm$ 15%	WIS.2442 Sh. 1	Dubilier Type 635
C156	Condenser	220pF $\pm$ 5%	WIS.185	Dubilier Type S690W
C157	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1	
C158	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C159	Condenser	.0005 $\mu$ F $\pm$ 15%	WIS.2442 Sh. 1	Dubilier Type 635
C160				
C161	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C162	Condenser	220pF $\pm$ 5%	WIS.185	Dubilier Type S690W
C163	Condenser	470pF $\pm$ 5%	WIS.185	Dubilier Type S690W
C164	Condenser	470pF $\pm$ 5%	WIS.185	Dubilier Type S690W
C165				
C166	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C167	Condenser	100pF $\pm$ 15%	WIS.2442	Dubilier Type 635
C168	Condenser	.01 $\mu$ F $\pm$ 20%	WIS.1609	Dubilier Type 691W
C169	Condenser	.01 $\mu$ F $\pm$ 20%	WIS.1609	Dubilier Type 691W
C170				
C171	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C172	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C173	Condenser	500pF $\pm$ 15%	WIS.2442	Dubilier Type 635
C174	Condenser	.01 $\mu$ F $\pm$ 20%	WIS.1609	Dubilier Type 691W

Ref.	Description	Value	Drawing No.	Remarks
C175	Condenser	25 $\mu$ F 25V. Wkg.	WIS.3201/C Sh. 1. Ref. 5A	T.C.C. Micro pack Electrolytic
C176				
C177	Condenser	100pF. $\pm$ 15%	WIS.2442	Dubilier Type 635
C178	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C179	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C180	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C181				
C182	Condenser	25 $\mu$ F 25V. Wkg.	WIS.3201/C Sh. 1. Ref. 5A	T.C.C. M/Cropack Electrolytic
C183				
C184	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C185	Condenser	0.1 $\mu$ F $\pm$ 20%	WIS.1609	Dubilier Type 691W
C186				
C187	Condenser	3,100pF $\pm$ 20%	WIS.1565 Sh. 2	Dubilier Type S691W
C188	Condenser, Trimmer	1,450 - 2,000pF	WIS.1588 Sh. 1. Ref. 12	
C189	Condenser, Trimmer	1,450 - 2,000pF	WIS.1588 Sh. 1. Ref. 12	
C190	Condenser	3,100pF $\pm$ 2%	WIS.1565 Sh. 2	Dubilier Type S691W
C191				
C192	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C193	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C194	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C195				
C196	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C197				
C198	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C199				
C200	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C201				
C202	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C203	Condenser	0.1 $\mu$ F $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metal pack Type CP.45N
C204	Condenser	.01 $\mu$ F $\pm$ 20%	WIS.1609	Dubilier Type 691W
C205				
C206				
C207				

Ref.	Description	Value	Drawing No.	Remarks
C208	Condenser	25 $\mu$ F.25V. Wkg.	WIS.3201/C Sh. 1. Ref. 5A	T.C.C. Micropack Electrolytic
C209	Condenser	25 $\mu$ F.25V. Wkg.	WIS.3201/C Sh. 1. Ref. 5A	T.C.C. Micropack Electrolytic
C210				
	CRYSTALS			
	FUSES			
F1	Fuse Holder		WIS.3142 Sh. 1. Ref. 7	Slydlok
	INDUCTANCES			
L1	Aerial Range 1		W.19534/B	
L2	Aerial Range 2		W.19535/B	
L3	Aerial Range 3		W.19536/B	
L4	Aerial Range 4		W.19537/B	
L5	Aerial Range 5		W.19538/B	
L6	Anode Range 1		W.19539/B	
L7	Anode Range 2		W.19540/B	
L8	Anode Range 3		W.19541/B	
L9	Anode Range 4		W.19542/B	
L10	Anode Range 5		W.19543/B	
L11	As L6		As L6	
L12	As L7		As L7	
L13	As L8		As L8	
L14	As L9		As L9	
L15	As L10		As L10	
L16	Oscillator Range 1		W.18765/B	
L17	Oscillator Range 2		W.18764/B	
L18	Oscillator Range 3		W.18763/B	
L19	Oscillator Range 4		W.18762/B	
L20	Oscillator Range 5		W.18761/B	
L21	I.F.1 Anode	4.5 Mc/s.	W.18778/B	
L22	I.F.1 Secondary	4.5 Mc/s.	W.18778/B	
L23	I.F.2 Primary	4.5 Mc/s.	W.18778/B	
L24	I.F.2 Grid	4.5 Mc/s.	W.18778/B	
L25	I.F.1 Anode	85 Kc/s.	W.18780/B	
L26	I.F.1 Grid	85 Kc/s.	W.18779/B	
L27	I.F.2 Anode	85 Kc/s.	W.18780/B	
L28	I.F.2 Grid	85 Kc/s.	W.18779/B	
L29	I.F.3 Anode	85 Kc/s.	W.18782/B	
L30	I.F.3 Diode	85 Kc/s.	W.18781/B	
L31	F.C. Oscillator	4.585 Mc/s.	W.18783/B	
L32	B.F.O.	86 Kc/s.	W.18784/B	
L33	Filter Choke	1000 c.p.s.	W.8132/C Sh.3.Ed.H.	Primary
L34	Filter Choke	1000 c.p.s.	W.8132/C Sh.3.Ed.J.	Secondary
L35	I.F. Rejector	4.5 Mc/s.	W.20363/B	
L36	Rejector Range 2		W.20389/B	

Ref.	Description	Value	Drawing No.	Remarks
L37	Supply Choke		W.15204/B Sh.1.Ed.B	24 V. D.C.
J1	JACKS Jack	8 Point	WIS.3150/C Sh. 1. Ref. 1	
J2	Jack	As J1	As J1.	
IL1	LAMPS Scale Lamp	14V. 0.2 Amp.	WIS.3292/C Sh. 1. Ref. 5.	
IL2	Scale Lamp	14V. 0.2 Amp.	As IL1	
LS1	LOUDSPEAKER Loudspeaker			Goodmans T4/201/3.2
LF1	NOTE FILTER Note Filter	1000 c.p.s.	W.19590 Sh.1.Ed.A	
P1	PLUGS AND SOCKETS Plug Aerial		WIS.3495/B Sh. 1. Ref. 4	A.M. Type 161
PS1	Socket Aerial			A.M. Type 56
PS2	Socket Power		WSK.836 Sh. 1. Ed. L.	7 Pin
PS3	Socket Power		WCP.393	5 Pin
PB1	Socket (AC/DC)		WIS.4286/C Sh. 1. Ref. 1	Belling Lee Type L.506
Z1	RELAYS Relay			Siemens H.96D.
Z2	Relay			As Z1.

Ref	Description	Value	Drawing No.	Remarks
	<b>RESISTORS</b>			
R1	Resistor	10,000Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R2	Resistor	220Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R3	Resistor	1,000Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R4	Resistor	3,300Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R5	Resistor	3,300Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R6	Resistor	100,000Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R7	Resistor	68,000Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R8				
R9	Resistor	470Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R10	Resistor	100,000Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R11	Resistor	330Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R12	Resistor	3,300Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R13	Resistor	100,000Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R14	Resistor	47,000Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R15				
R16	Resistor	68,000Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R17	Resistor	470Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R18	Resistor	330Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R19	Resistor	3,300Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R20				
R21	Resistor	100,000Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R22	Resistor	33,000Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R23	Resistor	22,000Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R24	Resistor	330Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R25				
R26	Resistor	330Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R27	Resistor	3,300Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8

Ref	Description	Value	Drawing No.	Remarks
R28	Resistor	100,000 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R29	Resistor	10,000 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R30	Resistor	1,000 $\Omega$ $\pm$ 5%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R31				
R32	Resistor	330 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R33				
R34	Resistor	330 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R35	Resistor	330 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R36				
R37	Resistor	33,000 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R38	Resistor	330 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R39	Resistor	330 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R40	Resistor	3,300 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R41				
R42	Resistor	47,000 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R43	Resistor	330 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R44	Resistor	22,000 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R45	Resistor	100,000 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R46				
R47	Resistor	22,000 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R48	Resistor	47,000 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R49	Resistor	47,000 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R50	Resistor	680 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R51				
R52	Resistor	330 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R53	Resistor	3,300 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R54	Resistor	2.2M $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R55	Resistor	1M $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R56				
R57	Resistor	68,000 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8

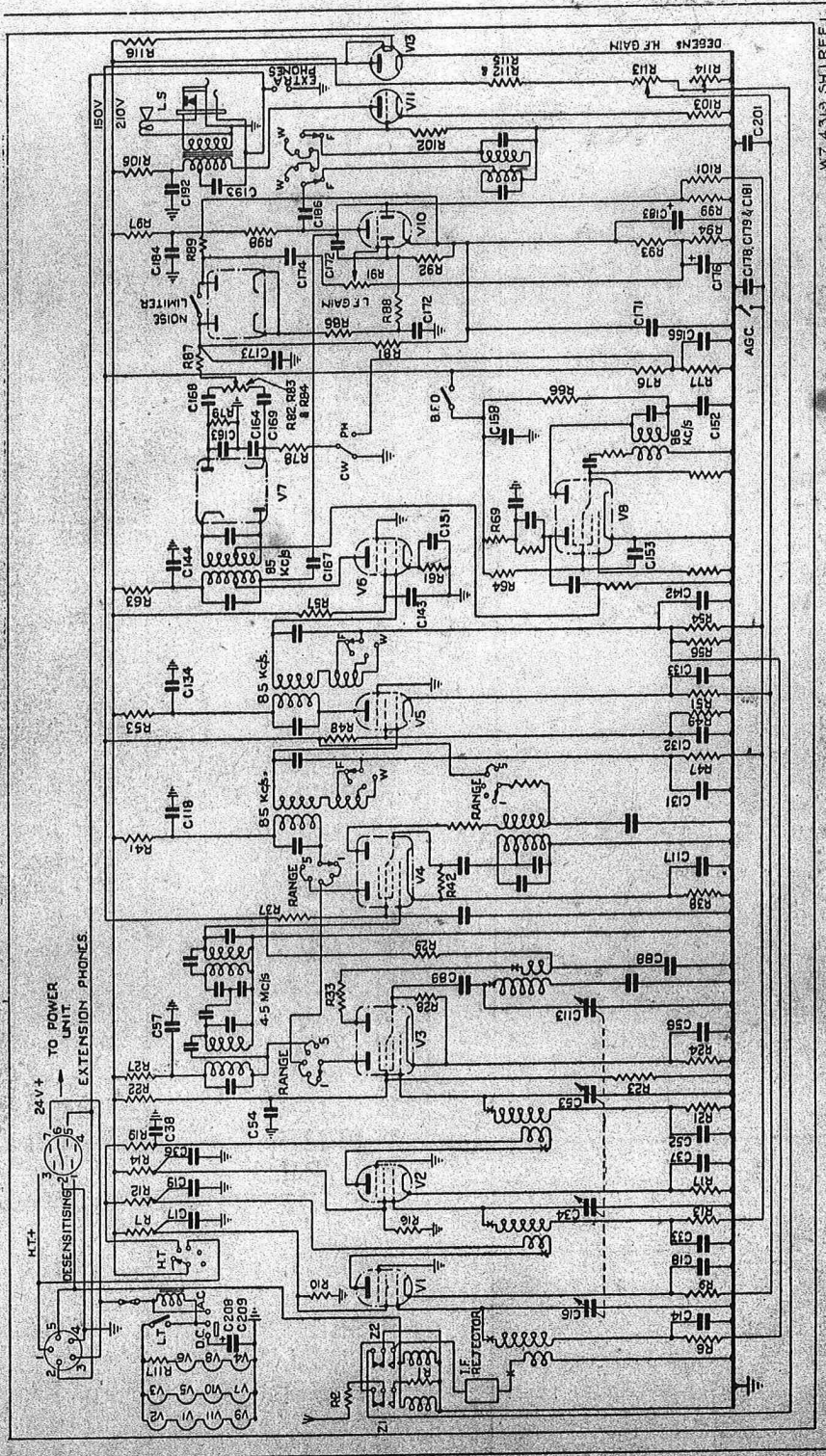


Ref.	Description	Value	Drawing No.	Remarks
R58	Resistor	150,000Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R59	Resistor	680Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R60	Resistor	680Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R61				
R62	Resistor	330Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R63	Resistor	3,300Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R64	Resistor	22,000Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R65	Resistor	150,000Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R66				
R67	Resistor	6,800Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R68	Resistor	100,000Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R69	Resistor	10,000Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R70	Resistor	4,700Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R71				
R72	Resistor	47,000Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R73	Resistor	470Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R74	Resistor	330Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R75	Resistor	330,000Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R76				
R77	Resistor	100,000Ω ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R78	Resistor	100,000Ω ± 5%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R79	Resistor	100,000Ω ± 5%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R80	Resistor	1MΩ ± 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R81				
R82	Resistor	470,000Ω ± 5%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R83	Resistance Variable	100,000Ω	WIS.3086 Sh. 1. Ref. 9	Morganite Stackpole Type LH. Linear Potentiometer
R84	Resistor	470,000Ω ± 5%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R85				

Ref.	Description	Value	Drawing No.	Remarks
R86	Resistor	2.2M $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R87	Resistor	33,000 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R88	Resistor	1M $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R89	Resistor	1M $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R90				
R91	Resistance Variable	2M $\Omega$	WIS.3032 Sh. 4. Ref. 40	Morganite Stackpole Type H. Log. Potentiometer
R92	Resistor	1M $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R93	Resistor	2,200 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R94	Resistor	15,000 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R95				
R96	Resistor	330 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R97	Resistor	10,000 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R98	Resistor	100,000 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R99	Resistor	2.2M $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R100				
R101	Resistor	220,000 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R102	Resistor	1M $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R103	Resistor	680 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R104	Resistor	330 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R105				
R106	Resistor	1,000 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R107				
R108				
R109				
R110				
R111				
R112	Resistor	68,000 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R113	Resistance Variable	5,000 $\Omega$ $\pm$ 5%	WIS.4297/B Sh. 1. Ref. 1	Reliance Type T.W. Inverse Log Pot
R114	Resistance Variable	20,000 $\Omega$ $\pm$ 5%	WIS.4297/B Sh. 1. Ref. 2	Reliance Type T.W. Inverse Log.
R115	Resistor	68,000 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8

Ref.	Description	Value	Drawing No.	Remarks
R116	Resistor	1,800Ω ± 5%	WIS.3336 Sh. 1. Ref. 1	Berco Type LW6
R117	Resistor	22Ω ± 5%	WIS.3336 Sh. 1. Ref. 1	Berco Type LW6
R118				
R119				
R120				
<b>SWITCHES</b>				
S1-S3	Switch	HF.	WIS.1197/C Sh. 432	
S4-S7	Switch	HF.	WIS.1197/C Sh. 433	
S9-S11	Switch	IF.	WIS.1197/C Sh. 435	
S12	Switch	Noise Limiter	WIS.1012	Bulgin Type S259/CHR Less on-off plates
S13	Switch	A.G.C.	As S12	
S14-S15	Switch	Operational	WIS.1147/C Sh. 437	
<b>TRANSFORMERS</b>				
T1	Output Transformer		WIS.4263 Sh. 1. Ref. 1	
<b>VALVES</b>				
V1	Valve			KTW61
V2	Valve			KTW61
V3	Valve			X61M
V4	Valve			X61M
V5	Valve			KTW61
V6	Valve			KTW61
V7	Valve			D63M.
V8	Valve			X61M
V9	Valve			D63M
V10	Valve			DH63
V11	Valve			L63
V13	Valve			VR/150/30

Ref.	Description	Value	Drawing No.	Remarks
	<b>Sub-ASSEMBLIES</b>			
	Aerial		W.18767 Ed.A.	
	1st & 2nd H.F.		W.18767 Ed.B.	
	Oscillator		W.18760 Ed.A.	
	IF. 1	4.5 Mc/s.	W.18785/B	
	IF. 2	4.5 Mc/s.	W.18786/B	
	IF. 1	85 Kc/s.	W.18787/B	
	IF. 2	85 Kc/s.	W.18787/B	
	IF. 3	85 Kc/s.	W.18788/B	
	B.F.O.	86 Kc/s.	W.19569/B Ed.A.	
	F.C. Oscillator Rejector	4.585 Mc/s.	W.18789/B W.20376/B	
	<b>MISCELLANEOUS ITEMS</b>			
	Slow Motion Drive & Condenser Assembled		W.20000 Ed..A.	
	Click Lever		W.19582/C Sh. 1. Ed.A.	For Range Switch
	Spring		10/W.20020/C	For Click Lever
	Spring		10/W.20020/C	For Frequency Pointer
	Pointer Carriage		W.19985/C Sh. 1. Ed.A.	For calibration drum
	Drive Cord		W.20004/C Sh. 1. Ed.A.	For Range Switch
	Drive Cord		W.20008/C Sh. 1. Ed.A.	For Frequency Pointer
	Lampholders		3/W.19587/C	
	Valveholders		W.IS.1894	Octal
	Valve Screening Cans		W.IS.2345 Sh. 1. Ref. 3	Body & Cap
	Top Cap Connectors		WIS.2412	For Valves
	Dust Iron Cores		W.IS.3242/C Sh. 1. Ref. 8	For H.F. Coils
	Handle with Pointer		W.SK.13614 Sh. 1. Ed.C.	For Gain Controls
	Handle		W.SK.15139 Sh. 1	For Range Switch etc.
	Knob		W.20006/C Sh. 1. Ed.A.	For Main Tuning



WZ 4313 SH1 REF 11

WZ.4319

SIMPLIFIED CIRCUIT DIAGRAM FOR 'MERCURY' RECEIVER (Type 1017)

Ref. 1

**COMPONENT SCHEDULE**  
**'ELECTRA' RECEIVER (TYPE 1018)**

*Symbols C1, C2 etc. correspond to those on Circuit Diagram WZ.3872/D, and on Component Location Drawings.*

*When Ordering Spares, Quote Ref. No., Value and Drawing No., e.g. C1-470pF  $\pm$  5% WIS.185*

Ref.	Description	Value	Drawing No.	Remarks
C1	CONDENSERS Condenser	470pF. $\pm$ 5%	WIS.185	Dubilier Type S690W
C2				
C3				
C4				
C5				
C6				
C7				
C8	Condenser Spiral Trimmer	3-30pF.	WIS.2848 Sh. 1. Ref. 1	
C9	Condenser Spiral Trimmer	3-30pF.	WIS.2848 Sh. 1. Ref. 1	
C10				
C11	Condenser Spiral Trimmer	3-30pF.	WIS.2848 Sh. 1. Ref. 1	
C12	Condenser Spiral Trimmer	3-30pF.	WIS.2848 Sh. 1. Ref. 1	
C13				
C14	Condenser	.01 $\mu$ F. $\pm$ 10%	WIS.1565 Sh. 2	Dubilier Type S.691W
C15	Condenser	.005 $\mu$ F. $\pm$ 20%	WIS.1609	Dubilier Type 691W
C16	Variable Condenser	210pF.	WIS.4159/C Sh. 1. Ref. 2	Ganged with C34, C53 & C113
C17	Condenser	.1 $\mu$ F. $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N.
C18	Condenser	.1 $\mu$ F. $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N.
C19	Condenser	.1 $\mu$ F. $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N.
C20	Condenser	.005 $\mu$ F. $\pm$ 20%	WIS.1609	Dubilier Type 691W
C21				
C22				
C23				
C24				
C25				
C26				
C27	Condenser Spiral Trimmer	3-30pF.	WIS.2848 Sh. 1. Ref. 1	
C28	Condenser Spiral Trimmer	3-30pF.	WIS.2848 Sh. 1. Ref. 1	
C29	Condenser Spiral Trimmer	3-30pF.	WIS.2848 Sh. 1. Ref. 1	
C30				
C31	Condenser Spiral Trimmer	3-30pF.	WIS.2848 Sh. 1. Ref. 1	

Ref.	Description	Value	Drawing No.	Remarks
C32	Condenser Spiral Trimmer	3-30pF	WIS.2845 Sh. 1. Ref. 1	
C33	Condenser	.01 $\mu$ F. $\pm$ 10%	WIS.1565 Sh. 2	Dubilier Type S.691W
C34	Variable Condenser	210pF.	WIS.4159/C Sh. 1. Ref. 2	Ganged with C16, C53 & C113
C35				
C36	Condenser	.1 $\mu$ F. $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C37	Condenser	.1 $\mu$ F. $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C38				
C39				
C40				
C41				
C42				
C43				
C44				
C45				
C46	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1	
C47	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1	
C48	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1	
C49	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1	
C50				
C51	Condenser Spiral Trimmer	3-30pF	WIS.2848 Sh. 1. Ref. 1	
C52	Condenser	.01 $\mu$ F. $\pm$ 10%	WIS.1565 Sh. 2	Dubilier Type S.691W
C53	Variable Condenser	210pF.	WIS.4159/C Sh. 1. Ref. 2	T.C.C. Metalpack Type C.P.45N
C54	Condenser	.1 $\mu$ F. $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C55				
C56	Condenser	.1 $\mu$ F. $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C57	Condenser	.1 $\mu$ F. $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C58	Condenser	220pF. $\pm$ 5%	WIS.185	Dubilier Type S.690W
C59	Condenser Spiral Trimmer	3-30pF.	WIS.2848 Sh. 1. Ref. 1	
C60				
C61	Condenser	220pF. $\pm$ 5%	WIS.185	Dubilier S.690W
C62	Condenser Spiral Trimmer	3-30pF.	WIS.2848 Sh. 1. Ref. 1	
C63	Condenser	220pF. $\pm$ 5%	WIS.185	Dubilier Type S.690W

Ref.	Description	Value	Drawing No.	Remarks
C64	Condenser Spiral Trimmer	3-30pF.	WIS.2848 Sh. 1. Ref. 1	
C65				
C66	Condenser Spiral Trimmer	3-30pF.	WIS.2848 Sh. 1. Ref. 1	
C67	Condenser	220pF. $\pm 5\%$	WIS.185	Dubilier Type S.690W
C68	Condenser Spiral Trimmer	2-8pF.	WIS.2848 Sh. 1. Ref. 2	
C69	Condenser Spiral Trimmer	2-8pF.	WIS.2848 Sh. 1. Ref. 2	
C70				
C71	Condenser	22pF. $\pm 10\%$	WIS.3450/B Sh. 1. Ref. 1	Erie Ceramicon Type N750K
C72	Condenser Spiral Trimmer	3-30pF.	WIS.2848 Sh. 1. Ref. 1	
C73	Condenser	220pF. $\pm 5\%$	WIS.185	Dubilier Type S.690W
C74	Condenser	47pF. $\pm 10\%$	WIS.3450/B Sh. 1. Ref. 1	Erie Ceramicon Type N.750K
C75				
C76				
C77				
C78				
C79				
C80				
C81				
C82				
C83				
C84				
C85				
C86				
C87	Condenser	.1 $\mu$ F. $\pm 20\%$ 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C88	Condenser	.01 $\mu$ F. $\pm 10\%$	WIS.1565 Sh. 2	Dubilier Type S.691W
C89	Condenser	.0005 $\mu$ F. $\pm 15\%$	WIS.2442	Dubilier Type 635
C90				
C91	Condenser	105pF. $\pm 2\%$	WIS.185	Dubilier Type S.690W
C92	Condenser	620pF. $\pm 2\%$	WIS.185	Dubilier Type S.690W
C93	Condenser	1200pF. $\pm 2\%$	WIS.1565 Sh. 2	Dubilier Type S.691W
C94	Condenser	2400pF. $\pm 2\%$	WIS.1565 Sh. 2	Dubilier Type S.691W
C95				
C96	Condenser	4700pF. $\pm 5\%$	WIS.1565 Sh. 2	Dubilier Type S.691W
C97	Condenser Spiral Trimmer	3-30pF.	WIS.2848 Sh. 1. Ref. 1	



Ref.	Description	Value	Drawing No.	Remarks
C98	Condenser Spiral Trimmer	3-30pF.	WIS.2848 Sh. 1. Ref. 1	
C99	Condenser Spiral Trimmer	3-30pF.	Sh. 1. Ref. 1	
C100			WIS.2848	
C101	Condenser Spiral Trimmer	3-30pF.	Sh. 1. Ref. 1 WIS.2848	
C102	Condenser Spiral Trimmer	3-30pF.	Sh. 1. Ref. 1 WIS.2848	
C103	Condenser	15pF. $\pm 10\%$	WIS.3450/B Sh. 1. Ref. 1	Erie Ceramicon Type N.750K
C104				
C105				
C106				
C107				
C108				
C109				
C110				
C111	Condenser Spiral Trimmer	2-8pF.	WIS.2848 Sh. 1. Ref. 2	
C112	Condenser		W.20369/C Ed.A.	Temperature Compensator
C113	Variable Condenser	210pF.	WIS.4159/C Sh. 1. Ref. 2	Ganged with C16, C34 & C53
C114	Condenser	33pF. $\pm 10\%$	WIS.3450/B Sh. 1. Ref. 1	Erie Ceramicon Type N.750K
C115	Condenser	.01 $\mu$ F. $\pm 20\%$	WIS.1609	Dubilier Type 691.W
C116				
C117				
C118				
C119				
C120				
C121				
C122				
C123				
C124				
C125				
C126				
C127				
C128				
C129				
C130				
C131	Condenser	.1 $\mu$ F. $\pm 20\%$ 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C132	Condenser	.1 $\mu$ F. $\pm 20\%$ 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C133	Condenser	.1 $\mu$ F. $\pm 20\%$ 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C134	Condenser	.1 $\mu$ F. $\pm 20\%$ 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C135				

Ref.	Description	Value	Drawing No.	Remarks
C136	Condenser Spiral Trimmer	3-30pF.	WIS.2848 Sh. 1. Ref. 1	
C137	Condenser	220pF. $\pm 5\%$	WIS.185	Dubilier Type S690W
C138	Condenser	220pF. $\pm 5\%$	WIS.185	Dubilier Type S690W
C139	Condenser Spiral Trimmer	3-30pF.	WIS.2848 Sh. 1. Ref. 1	
C140				
C141				
C142	Condenser	.1 $\mu$ F. $\pm 20\%$ 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C143	Condenser	.1 $\mu$ F. $\pm 20\%$ 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C144	Condenser	.1 $\mu$ F. $\pm 20\%$ 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C145				
C146	Condenser Spiral Trimmer	3-30pF.	WIS.2848 Sh. 1. Ref. 1	
C147	Condenser	220pF. $\pm 5\%$	WIS.185	Dubilier Type S.690W
C148	Condenser Spiral Trimmer	3-30pF.	WIS.2848 Sh. 1. Ref. 1	
C149	Condenser	220pF. $\pm 5\%$	WIS.185	Dubilier Type S.690W
C150				
C151	Condenser	.1 $\mu$ F. $\pm 20\%$ 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C152	Condenser	.1 $\mu$ F. $\pm 20\%$ 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C153	Condenser	.1 $\mu$ F. $\pm 20\%$ 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C154	Condenser	.0005 $\mu$ F $\pm 15\%$	WIS.2442	Dubilier Type 635
C155				
C156	Condenser	220pF. $\pm 5\%$	WIS.185	Dubilier Type S.690W
C157	Condenser Spiral Trimmer	3-30pF.	WIS.2848 Sh. 1. Ref. 1	
C158	Condenser	.1 $\mu$ F. $\pm 20\%$ 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 1	T.C.C. Metalpack Type CP.45N
C159	Condenser	.0001 $\mu$ F. $\pm 15\%$	WIS.2442	Dubilier Type 635
C160				
C161	Condenser	.1 $\mu$ F. $\pm 20\%$ 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C162	Condenser	.0001 $\mu$ F. $\pm 15\%$	WIS.2442	Dubilier Type 635
C163	Condenser	470pF. $\pm 5\%$	WIS.185	Dubilier Type S.690W
C164	Condenser	470pF. $\pm 5\%$	WIS.185	Dubilier Type S.690W

Ref.	Description	Value	Drawing No.	Remarks
C165				
C166	Condenser	.1 $\mu$ F. $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C167	Condenser	.0001 $\mu$ F. $\pm$ 15%	WIS.2442	Dubilier Type 635
C168	Condenser	.01 $\mu$ F. $\pm$ 20%	WIS.1609	Dubilier Type 691W
C169	Condenser	.01 $\mu$ F. $\pm$ 20%	WIS.1609	Dubilier Type 691W
C170				
C171	Condenser	.1 $\mu$ F. $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C172	Condenser	.1 $\mu$ F. $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C173	Condenser	.0005 $\mu$ F. $\pm$ 15%	WIS.2442	Dubilier Type 635
C174	Condenser	.01 $\mu$ F. $\pm$ 20%	WIS.1609	Dubilier Type 691W
C175				
C176	Electrolytic Condenser	25 $\mu$ F. -20% +50% 25V. Wkg.	WIS.3201/C Sh. 1. Ref. 5A	T.C.C. Micropack Type CE.32C
C177	Condenser	.0001 $\mu$ F. $\pm$ 15%	WIS.2442	Dubilier Type 635
C178	Condenser	.1 $\mu$ F. $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C179	Condenser	.1 $\mu$ F. $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C180				
C181	Condenser	.1 $\mu$ F. $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C182	Condenser	.0001 $\mu$ F. $\pm$ 15%	WIS.2442	Dubilier Type 635
C183	Electrolytic Condenser	25 $\mu$ F. -20% +50% 25V. Wkg.	WIS.3201/C Sh. 1. Ref. 5A	T.C.C. Micropack Type CE32C
C184	Condenser	.1 $\mu$ F. $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C185				
C186	Condenser	.01 $\mu$ F. $\pm$ 20%	WIS.1609	Dubilier Type 691W
C187	Condenser	3100pF. $\pm$ 2%	WIS.1565 Sh. 2	Dubilier Type S691W
C188	Condenser Trimmer	1450-2000pF.	WIS.1588 Sh. 1. Ref. 12	
C189	Condenser Trimmer	1450-2000pF.	WIS.1588 Sh. 1. Ref. 12	
C190				
C191	Condenser	3100pF. $\pm$ 2%	WIS.1565 Sh. 2	Dubilier Type S691W
C192	Condenser	.1 $\mu$ F. $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C193	Condenser	.1 $\mu$ F. $\pm$ 20% 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N

Ref.	Description	Value	Drawing No.	Remarks
C194 C195 C196	Condenser	220pF. $\pm 5\%$	WIS.185	Dubilier Type S.690W
C197	Condenser	.1 $\mu$ F. $\pm 20\%$ 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C198	Condenser	10pF. $\pm 10\%$	WIS.3450/B Sh. 1. Ref. 7	Erie Ceramicon Type P.120K
C199	Condenser	.1 $\mu$ F. $\pm 20\%$ 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C200 C201	Condenser	.1 $\mu$ F. $\pm 20\%$ 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C202	Condenser	.1 $\mu$ F. $\pm 20\%$ 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C203	Condenser	.1 $\mu$ F. $\pm 20\%$ 350V. Wkg.	WIS.3955/C Sh. 1. Ref. 7A	T.C.C. Metalpack Type CP.45N
C204	Condenser	.01 $\mu$ F. $\pm 20\%$	WIS.1609	Dubilier Type 691W
C205 C206 C207				
C208	Electrolytic Condenser	25 $\mu$ F. $-20\% + 50\%$ 25V. Wkg.	WIS.3201/C Sh. 1. Ref. 5A	T.C.C. Micropack Type CE.32C
C209	Electrolytic Condenser	25 $\mu$ F. $-20\% + 50\%$ 25V. Wkg.	WIS.3201/C Sh. 1. Ref. 5A	T.C.C. Micropack Type CE.32C
C210				
	<b>CRYSTALS</b>			
Q1	Crystal Resonator	690 Kc/s.	Spec. MS.200	Type B
Q2	Crystal Resonator	690 Kc/s.	Spec. MS.200	Type A
Q3	Crystal Calibrator	690 Kc/s. MS.128	Spec.	
	<b>FUSES</b>			
F1	Fuse Holder		WIS.3142/C Sh. 1. Ref. 7	Slydlok
	<b>INDUCTANCES</b>			
L1	Aerial Range 1		W.19544/B	
L2	Aerial Range 2		W.19545/B	
L3	Aerial Range 3		W.19546/B	
L4	Aerial Range 4		W.19547/B	
L5	Aerial Range 5		W.19548/B	

Ref.	Description	Value	Drawing No.	Remarks
L6	Anode Range 1		W.19549/B	
L7	Anode Range 2		W.19550/B	
L8	Anode Range 3		W.19551/B	
L9	Anode Range 4		W.19552/B	
L10	Anode Range 5		W.19553/B	
L11	As L6		As L6	
L12	As L7		As L7	
L13	As L8		As L8	
L14	As L9		As L9	
L15	As L10		As L10	
L16	Oscillator Range 1		W.19572/B	
L17	Oscillator Range 2		W.19573/B	
L18	Oscillator Range 3		W.19574/B	
L19	Oscillator Range 4		W.19575/B	
L20	Oscillator Range 5		W.19553/B	
L21	I.F.1 Anode	690 Kc/s.	W.19554/B	Circuit A
L22	I.F.1 Secondary	690 Kc/s.	W.19555/B	Circuit A
L23	I.F.1 Primary	690 Kc/s.	W.19556/B	Circuit B
L24	I.F.1 Crystal	690 Kc/s.	W.19557/B	Circuit B
L25	I.F.1	690 Kc/s.	W.19558/B	Circuit C
L26				
L27	I.F.2 Anode	690 Kc/s.	W.19559/B	
L28	I.F.2 Grid	690 Kc/s.	W.19560/B	
L29	I.F.3 Anode	690 Kc/s.	W.19561/B	
L30	I.F.3 Diode	690 Kc/s.	W.19562/B	
L31	Calibrator Osc.	690 Kc/s.	W.19584/B	
L32	B.F.O.	691 Kc/s.	W.19563/B	
L33	Filter Choke	1000 c.p.s.	W.8132/C	Primary
L34	Filter Choke	1000 c.p.s.	Sh. 3. Ed.H W.8132/C	Secondary
L35	Rejector Range 1		Sh. 3. Ed.J W.19585/B	
L36				
L37				
	JACKS			
J1	Jack	8 Point	WIS.3150/C Sh. 1. Ref. 1	
J2	Jack	As J1	As J1	
	LAMPS			
1L1	Scale Lamp	14V. 0.2 Amp.	WIS.3292/C Sh. 1. Ref. 5	
1L2	Scale Lamp	14V. 0.2 Amp.	As 1L1	
LS1	LOUDSPEAKER Loudspeaker			Goodmans T4/201/3.2

Ref.	Description	Value	Drawing No.	Remarks
LF1	NOTE FILTER Note Filter	1000 c.p.s.	W.19590 Sh. 1. Ed.A	
P1	PLUGS & SOCKETS Plug Aerial		WIS.3495/B Sh. 1. Ref. 4	A.M. Type 161
PS1	Socket Aerial			A.M. Type 56
PS2	Socket Power		WSK.836 Sh. 1. Ed.L.	7 Pin
PS3	Socket Power		WCP.393	5 Pin
PB1	Socket (AC/DC)		WIS.4286/C Sh. 1. Ref. 1	Belling Lee Type L506
Z1	RELAYS Relay			Siemens H96D
Z2	Relay			As Z1
R1	RESISTORS Resistor	10,000 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R2	Resistor	2,200 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R3				
R4				
R5	Resistor	100 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R6	Resistor	100,000 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R7	Resistor	47,000 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R8	Resistor	68,000 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R9	Resistor	470 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R10				
R11	Resistor	330 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R12	Resistor	3,300 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R13	Resistor	100,000 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R14	Resistor	47,000 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R15				
R16	Resistor	68,000 $\Omega$ $\pm$ 20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8

Ref.	Description	Value	Drawing No.	Remarks
R17	Resistor	470Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R18	Resistor	470Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R19	Resistor	3,300Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R20				
R21	Resistor	100,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R22	Resistor	22,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R23	Resistor	68,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R24	Resistor	330Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R25				
R26	Resistor	330Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R27	Resistor	3,300Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R28	Resistor	4,700Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R29	Resistor	3,300Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R30	Resistor	470,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R31	Resistor	1,000Ω ±5%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R32	Resistor	22,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R33				
R34				
R35				
R36	Resistor	330Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R37				
R38				
R39				
R40				
R41				
R42				
R43				
R44				
R45				
R46	Resistor	470,000Ω ±5%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R47	Resistor	100,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R48	Resistor	22,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R49	Resistor	47,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8

Ref.	Description	Value	Drawing No.	Remarks
R50				
R51	Resistor	330Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R52	Resistor	330Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R53	Resistor	3,300Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R54	Resistor	2.2MΩ ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R55				
R56	Resistor	1.0MΩ ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R57	Resistor	68,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R58				
R59	Resistor	470Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R60				
R61	Resistor	680Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R62	Resistor	330Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R63	Resistor	3,300Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R64	Resistor	22,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R65				
R66	Resistor	150,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R67	Resistor	4,700Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R68	Resistor	2.2MΩ ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R69	Resistor	10,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R70				
R71	Resistor	4,700Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R72	Resistor	47,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R73	Resistor	1,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R74	Resistor	330Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R75				
R76	Resistor	330,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R77	Resistor	100,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R78	Resistor	100,000Ω ±5%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8

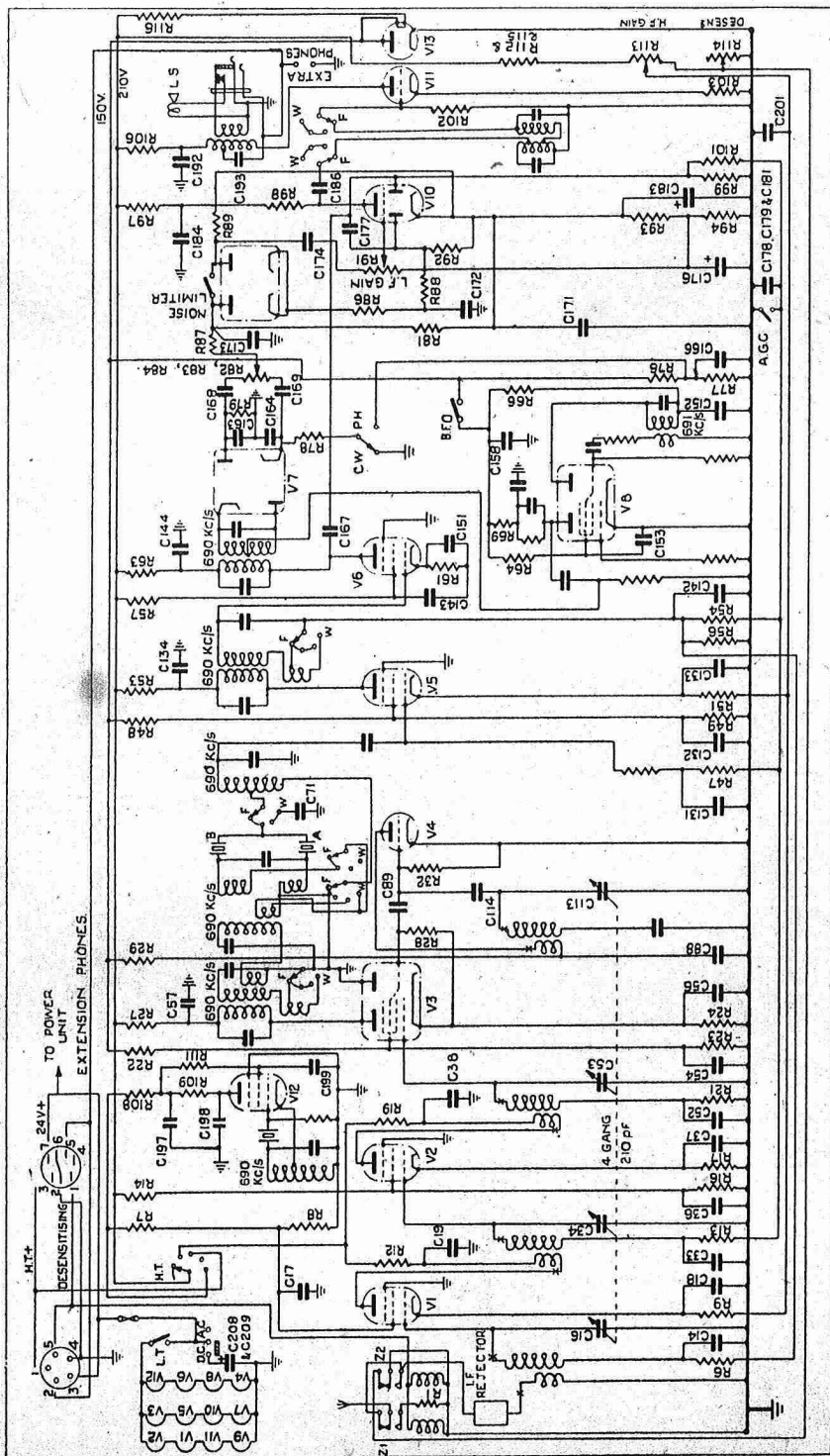


Ref.	Description	Value	Drawing No.	Remarks
R79	Resistor	100,000Ω ±5%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R80	Resistor	1.0MΩ ±20%	WIS.3903	Erie Type 8
R81			Sh. 1. Ref. 5	
R82	Resistor	470,000Ω ±5%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R83	Variable Resistor	100,000Ω	WIS.3086 Sh. 1 Ref. 9	Morganite Stackpole Type LH
R84	Resistor	470,000Ω ±5%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R85	Resistor	2.2MΩ ±20%	WIS.3903	Erie Type 8
R86			Sh. 1. Ref. 5	
R87	Resistor	33,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R88	Resistor	1.0MΩ ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R89	Resistor	1.0MΩ ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R90	Variable Resistor	2.0MΩ	WIS.3032	Morganite Stackpole Type H. Log
R91			Sh. 4. Ref. 40	
R92	Resistor	1.0MΩ ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R93	Resistor	2,200Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R94	Resistor	15,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R95	Resistor	330Ω ±20%	WIS.3903	Erie Type 8
R96			Sh. 1. Ref. 5	
R97	Resistor	10,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R98	Resistor	100,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R99	Resistor	2.2MΩ ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R100	Resistor	220,000Ω ±20%	WIS.3903	Erie Type 8
R101			Sh. 1. Ref. 5	
R102	Resistor	1.0MΩ ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R103	Resistor	680Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R104	Resistor	330Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R105	Resistor	1,000Ω ±20%	WIS.3903	Erie Type 8
R106			Sh. 1. Ref. 5	
R107	Resistor	330,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8

Ref.	Description	Value	Drawing No.	Remarks
R108	Resistor	10,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R109	Resistor	47,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R110	Resistor	47,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R111	Resistor	47,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R112	Resistor	68,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R113	Variable resistor	5,000Ω ±5%	WIS.4297/C Sh. 1. Ref. 1	Reliance Type TW Inverse log
R114	Variable resistor	20,000Ω ±5%	WIS.4298/B Sh. 1. Ref. 2	Reliance Type TW Inverse log
R115	Resistor	68,000Ω ±20%	WIS.3903 Sh. 1. Ref. 5	Reliance Type TW
R116	Resistor	1,800Ω ±5%	WIS.3336 Sh. 1. Ref. 1	BERCo Type LW6
SWITCHES				
S1-S3	Switch	H.F.	WIS.1197/C Sh. 432	
S4-S6	Switch	H.F.	WIS.1197/C Sh. 434	
S8-S11	Switch	I.F.	WIS.1197/C Sh. 436	
S12	Switch	Noise Limiter	1/WIS.1012	Bulgin Type S259/ CHR. less On-off plate
S13	Switch	A.G.C.	As S12	
S14-S15	Switch	Operational	WIS.1197/C Sh. 437	
TRANSFORMERS				
T1	Output Transformer		WIS.4263 Sh. 1. Ref. 1	
VALVES				
V1	Valve			KTW.61
V2	Valve			KTW.61
V3	Valve			X61M
V4	Valve			L63
V5	Valve			KTW61
V6	Valve			KTW61
V7	Valve			D63M
V8	Valve			X61M
V9	Valve			D63M
V10	Valve			DH63
V11	Valve			L63
V12	Valve			KTW61
V13	Valve			VR/150/30

Ref.	Description	Value	Drawing No.	Remarks
	<b>Sub-ASSEMBLIES</b>			
	Aerial		W.18767 Ed.C.	
	1st & 2nd H.F.		W.18767 Ed.D.	
	Oscillator		W.18760 Ed.B	
	IF 1 "A"	690 K/cs.	W.19564/B	
	IF 1 "B"	690 K/cs.	W.19565/B	
	IF 1 "C"	690 K/cs.	W.19566/B	
	IF 2	690 K/cs.	W.19567/B	
	IF 3	690 K/cs.	W.19568/B	
	B.F.O.	691 K/cs.	W.19569/B Ed.B.	
	Calibrator	690 K/cs.	W.19583/B	
	Rejector		W.19586/B	
	<b>MISCELLANEOUS ITEMS</b>			
	Slow Motion Drive & Condenser		W.20000 Ed.B.	
	Bandspread Drive Assembled Click Lever		W.20017/B Sh. 1. Ed.A. W.19582 Sh. 1. Ed.A.	For Range Switch
	Spring		10/W.20020/C	For Click Lever
	Spring		12/W.20020/C	For Bandspread Pointer
	Spring		10/W.20020/C	For Frequency Pointer
	Pointer Carriage		W.19985/C Sh. 1. Ed.A.	For Calibration Drum
	Pointer Carriage		W.20002/C Sh. 1. Ed.A.	For Bandspread Scale
	Drive Cord		W.20004/C Sh. 1. Ed.A.	For Range Switch
	Drive Cord		W.20008/C Sh. 1. Ed. B	For Bandspread Pointer
	Drive Cord		W.20008/C Sh. 1. Ed.A.	For Frequency Pointer
	Lamp Holders		3/W.19587/C	
	Valve Holders		W.IS.1894	Octal.
	Valve Screening Cans		W.IS.2345 Sh. 1. Ref. 3	Body & Cap
	Top Cap		W.IS.2412	For Valves
	Connectors			
	Dust Iron Core		W.IS.3242/C Sh. 1. Ref. 8	For H.F. Coils

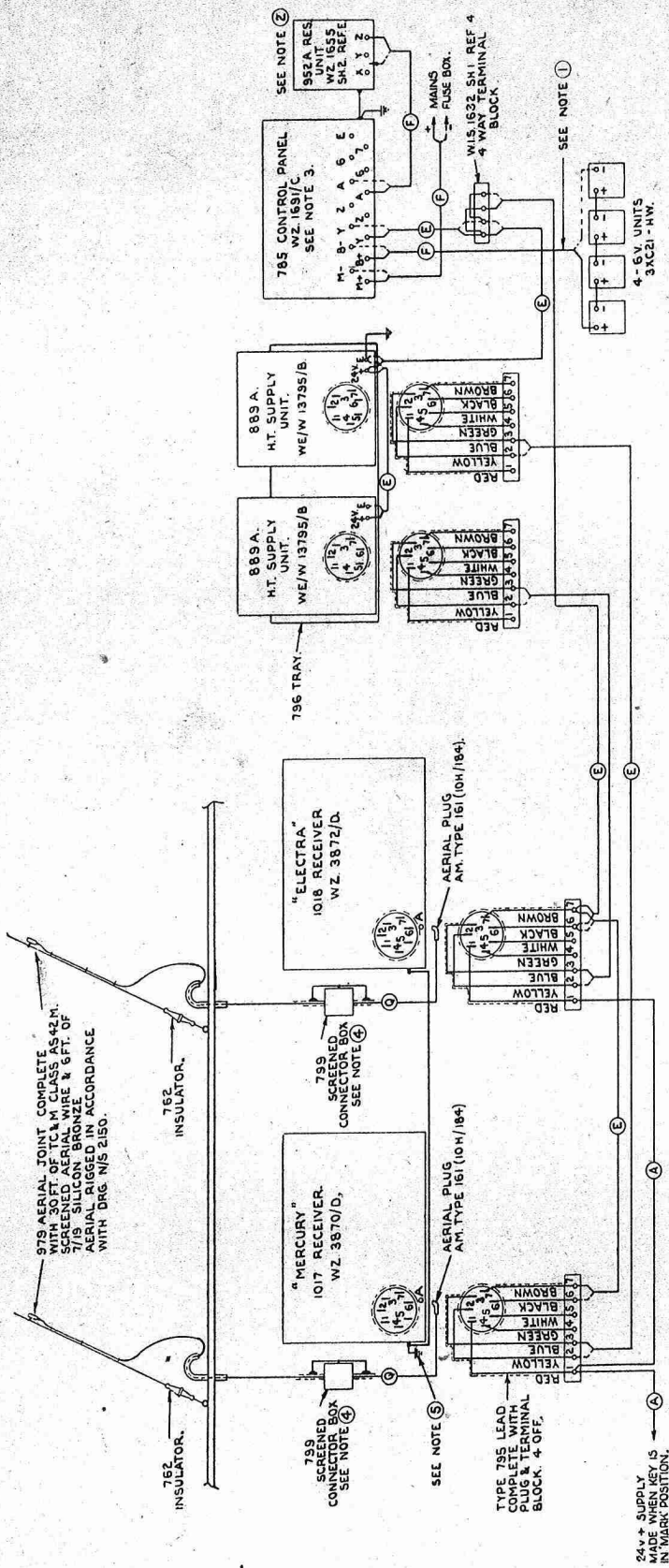
Ref.	Description	Value	Drawing No	Remarks
	Handle with Pointer Handle  Knob		W.SK.13614 Sh. 1. Ed.C. W.SK.15139 Sh. 1. W.20006/C Sh. 1. Ed.A.	For Gain Controls  For Range Switch etc. For Main Tuning



WZ 4318

SIMPLIFIED CIRCUIT DIAGRAM FOR 'ELECTRA' (Type 1018)

Ref. 1

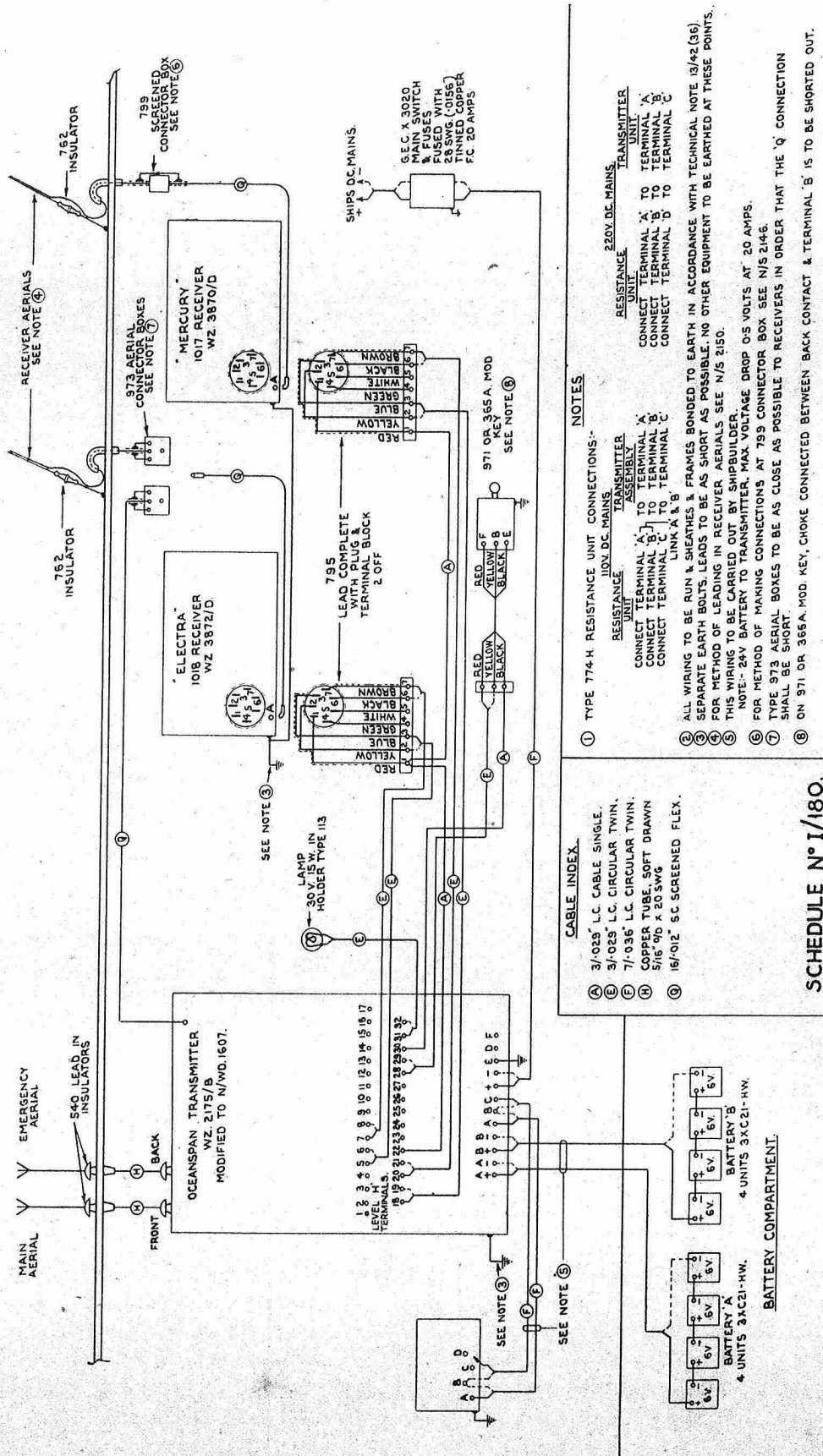


- FUSE DATA.**
- 785 CONTROL PANEL:  
 F1 & F2 - 36 SWG (1/0076) TINNED COPPER FC. 10 AMPS.  
 F3 & F4 - 26 SWG (1/018) " " FC. 30 AMPS.  
 MAIN SWITCH  
 26 SWG (1/0156) TINNED COPPER FC. 20 AMPS.  
 RECEIVER  
 F1, 24 SWG (022) LEAD TIN ALLOY FC. 4 AMPS.
- CABLE INDEX.**
- (A) 3/029" L.C. SINGLE.  
 (E) 3/029" L.C. CIRCULAR TWIN  
 (F) 7/036" L.C. CIRCULAR TWIN.  
 (G) 16/012" SINGLE SCREENED FLEX.
- NOTES.**
- THIS LEAD SUPPLIED & RUN BY SHIPBUILDER IN CABLE AS STATED OR EQUIVALENT
  - FOR 110V DC MAINS, CONNECT TO TERMINALS 'Y' & 'Z' AND LINK 'X' & 'Z'. FOR 220V DC MAINS CONNECT TO TERMINALS 'Y' & 'Z' AND REMOVE LINK.
  - 785 CONTACT PANEL IS SUPPLIED ARRANGED FOR 110V DC MAINS. FOR 220V DC MAINS REMOVE CONTACT PANEL FROM CASE & REMOVE THE LINK WHICH SHORT CIRCUITS THE OUTER RESISTANCE IN BOTH CASES. ENSURE THAT THE POSITIVE LEAD TO THE VOLTMETER IS CONNECTED TO THE 30V TERMINAL.
  - FOR METHOD OF CONNECTING TO 789 CONNECTOR BOXES SEE N/S 2146.
  - SEPARATE EARTH BOLT THIS LEAD TO BE AS SHORT AS POSSIBLE & NO OTHER APPARATUS TO BE EARTHED AT THIS POINT.

SCHEDULE N° R.S. 29.

N/WDI559

INSTALLATION WIRING DIAGRAM OF 'MERCURY' AND 'ELECTRA' RECEIVERS



**CABLE INDEX.**

- (A) 3/029" L.C. CABLE SINGLE.
- (B) 3/023" L.C. CIRCULAR TWIN.
- (C) 7/036" L.C. CIRCULAR TWIN.
- (D) COPPER TUBE SOFT DRAWN 5/16" O.D. X 20 SWG.
- (E) 16/012" SC SCREENED FLEX.

**NOTES**

- ① TYPE 774-H RESISTANCE UNIT CONNECTIONS:-  
RESISTANCE UNIT TRANSMITTER  
CONNECT TERMINAL 'A' TO TERMINAL 'A'.  
CONNECT TERMINAL 'B' TO TERMINAL 'B'.  
CONNECT TERMINAL 'C' TO TERMINAL 'C'.  
LINK 'A' & 'B'.
- ② ALL WIRING TO BE RUN IN SHEATHS & FRAMES BONDED TO EARTH IN ACCORDANCE WITH TECHNICAL NOTE 13/A2(36).
- ③ SEPARATE EARTH BOLTS. LEADS TO BE AS SHORT AS POSSIBLE. NO OTHER EQUIPMENT TO BE EARTHED AT THESE POINTS.
- ④ FOR METHOD OF LEADING IN RECEIVER AERIALS SEE N/S 2150.
- ⑤ THIS WIRING TO BE CARRIED OUT BY SHIPBUILDER.
- ⑥ NOTE-24V BATTERY TO TRANSMITTER. MAX VOLTAGE DROP 0.5 VOLTS AT 20 AMPS.
- ⑦ FOR METHOD OF MAKING CONNECTIONS AT 795 CONNECTOR BOX SEE N/S 2146.
- ⑧ TYPE 973 AERIAL BOXES TO BE AS CLOSE AS POSSIBLE TO RECEIVERS IN ORDER THAT THE 'Q' CONNECTION SHALL BE SHORT.
- ⑨ ON 971 OR 365A. MOD. KEY, CHOKE CONNECTED BETWEEN BACK CONTACT & TERMINAL 'B' IS TO BE SHORTED OUT.

**SCHEDULE N° I/180.**

INSTALLATION DIAGRAM OF 'OCEANSPAN' OR 'TRADER' TRANSMITTER WITH 'MERCURY' AND 'ELECTRA' RECEIVERS

N/WD1704

## APPENDIX

# POWER SUPPLY UNITS—TYPE 889A & TYPE 966A

As indicated earlier in this pamphlet, the 'Electra' and 'Mercury' Receivers are designed to operate from the type 889A or 966A supply unit in conjunction with primary sources of 24 volts, 110 volts or 220 volts D.C., or from 230 volts 50 c.p.s. A.C.

The type 966A unit is a modified edition of the type 889A and is included as part of the 'Ocean-span' installation, where it may be used to operate additional receiving equipment such as the 'Vigilant' Automatic Alarm as well as the main receiver.

The two units differ only in minor details concerning the method of bringing out the external connections, the following description may be taken as referring to both types, unless otherwise stated.

The input voltages for which the units are designed can be any one of the following:—

D.C.	...	24, 100, 110, 200 or 220
A.C.	...	230 V. 50 c.p.s.

The outputs given are 240 volts at 60 mA. and 24 volts at 1.0 amp. The latter L.T. supply is connected directly across to the input line when the latter is 24 volts D.C., but on other supply voltages the heater output is A.C. at a frequency of 105 c.p.s. derived from an auxiliary winding on the transformer.

Reference to the circuit diagrams WE/W.13795B (or WE/W.15213/B in the case of the type 966A) shows that on D.C. inputs, a non-synchronous vibrator is used to convert this input to A.C. at a frequency of 105 c.p.s. By a system of taps on the primary of the transformer an approximately constant output is obtained for the various values of input supply voltage. Subsequent rectification and ripple filtering of the H.T. output is obtained by orthodox means.

It will be seen that the heater of the rectifier (type 6X5G) is supplied from an auxiliary heater winding on the transformer. Thus H.T. is not available until a few seconds after switching on.

When used normally with the CR.300 Receiver, the H.T. negative output is earthed in the latter, but in the supply unit this line has been suitably filtered to enable it to be used with other equipment, such as the Auto-Alarm Type 700, which requires an H.T. negative which is isolated from earth.

For 230 volts A.C. supplies, the vibrator is not used and the operation becomes identical to normal A.C. mains unit practice.

Referring again to the diagram, it will be noted that the links 'Y' and 'Z' are used to connect the heater output, either to the input line for 24 volt supply or to the auxiliary secondary for other inputs.

On A.C. inputs the 'on-off' switch interrupts both the input lines, but on D.C. inputs the switch and fuse only interrupt the 'live' side of the supply. Where an external earth appears on one side of the latter, care should be taken that this earthed side is connected up to the corresponding (non-switched) input terminal.

### Mechanical Design

Although basically similar in construction to the Type 889 Unit, the following points of difference should be noted:—

- (1) Tap changing for various supply voltages is effected by a link arrangement mounted on top of the transformer. No switches are used for this purpose.
- (2) Instead of occupying a socket similar to that used for the working vibrator, the spare vibrator is mounted pins upwards in a clip.
- (3) One pair of input terminals is used for all D.C. inputs instead of a separate line for each voltage.

In the type 966A the modifications introduced are similar to those made for the earlier Type 966, and the new design can be used directly as a replacement for the latter without any external wiring alterations.



## Installation

If the supply source is 24 volts D.C., care should be taken to check whether one side of the latter is earthed, either externally or by connection to other equipment; if so, the earthed side of the supply should be connected to the input terminal on the extreme right of the panel.

On A.C. supply and other D.C. inputs polarity is unimportant.

The correct settings of the links for each supply voltage are shown on the printed label on the side of the chassis. In the case of 24 volt D.C. supplies the condenser C.12 should be connected in circuit. With this exception the link settings are self-explanatory by the engraving on the board.

On A.C. supply the vibrator should be removed (or mounted pins upwards in its clip). In this case the links 'Y' and 'Z' should be connected to the 220/110 V. terminals, and all other links connected as for 24 volts D.C. supply.

## Fuses (889A)

On D.C. supplies only the left hand fuse is in circuit, but it will be found convenient to wire *both* with the appropriate fuse wire, and thus have a spare available. On A.C. both fuses are in circuit. Correct gauge of wire is as follows:—

Supply Volts	Fusing Current	Wire Gauge	
		Lead Tin	Copper
230 volts A.C.			
220 „ D.C.	2.0 amps.	No. 29 SWG.	No. 43 SWG.
110 „ D.C.			
24 „ D.C.	5.0 amps.	No. 24 SWG.	No. 38 SWG.

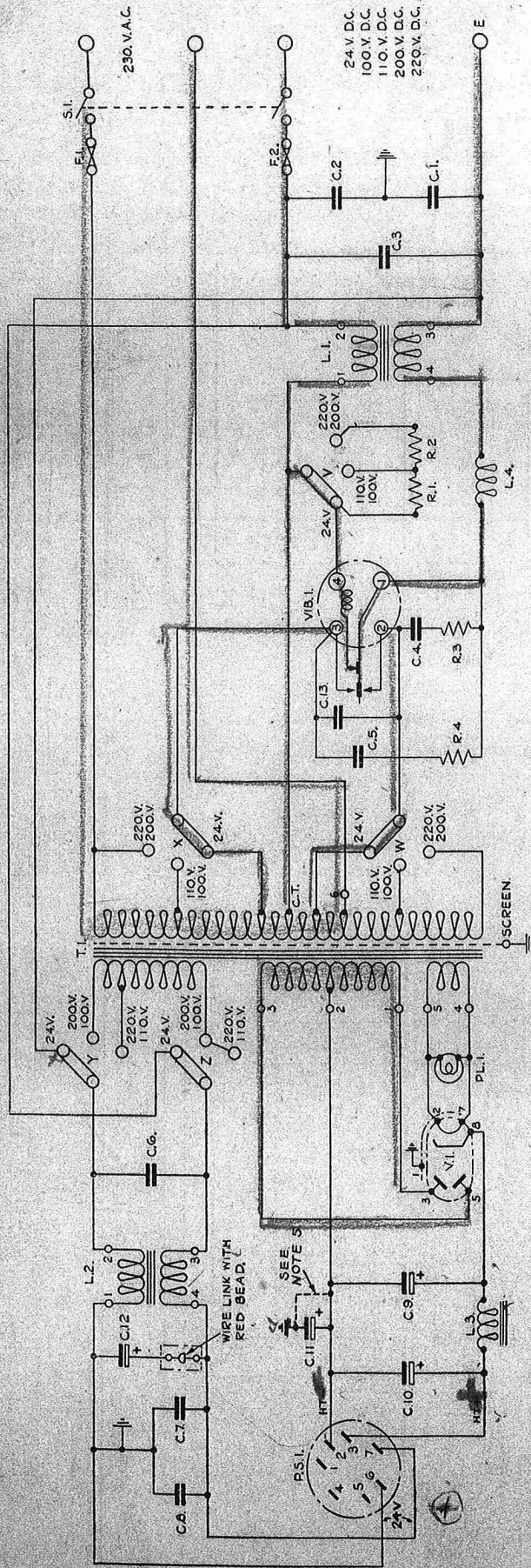
A small stock of spare fuse wire is supplied inside the case.

## Operation

Both on D.C. and A.C. supplies the pilot light should be illuminated immediately after switching on, but full H.T. output will not be available until several seconds have elapsed. It should be noted that the pilot light (on 889A only) is connected across the auxiliary heater winding supplying the rectifier; thus on D.C. supplies it gives an indication that the vibrator is functioning.

After approximately 1,500 hours of use the vibrator may require replacement. A spare unit is carried in a clip adjacent to the working unit.

	<i>Index</i>	<i>Drawing Ref.</i>	<i>Page</i>
Type 889A.	Circuit Diagram ... ..	WE/W.13795/B. Sht. 1. ... ..	85
	Component Location Drawing ... ..	WE/W.13795/B. Sht. 1A. ... ..	86
	Outline Drawing ... ..	WZ.3444. Sht. 1. ... ..	87
	Component List ... ..	WZ.3441/C. Shts. 1-3. ... ..	88-89
Type 966A.	Circuit Diagram ... ..	WE/15213/B. Sht. 1. ... ..	90
	Component Location Drawing ... ..	WE/15213/B. Sht. 1A. ... ..	91
	Component List ... ..	WZ.3442/C. Sht. 1 & 2. ... ..	92-93

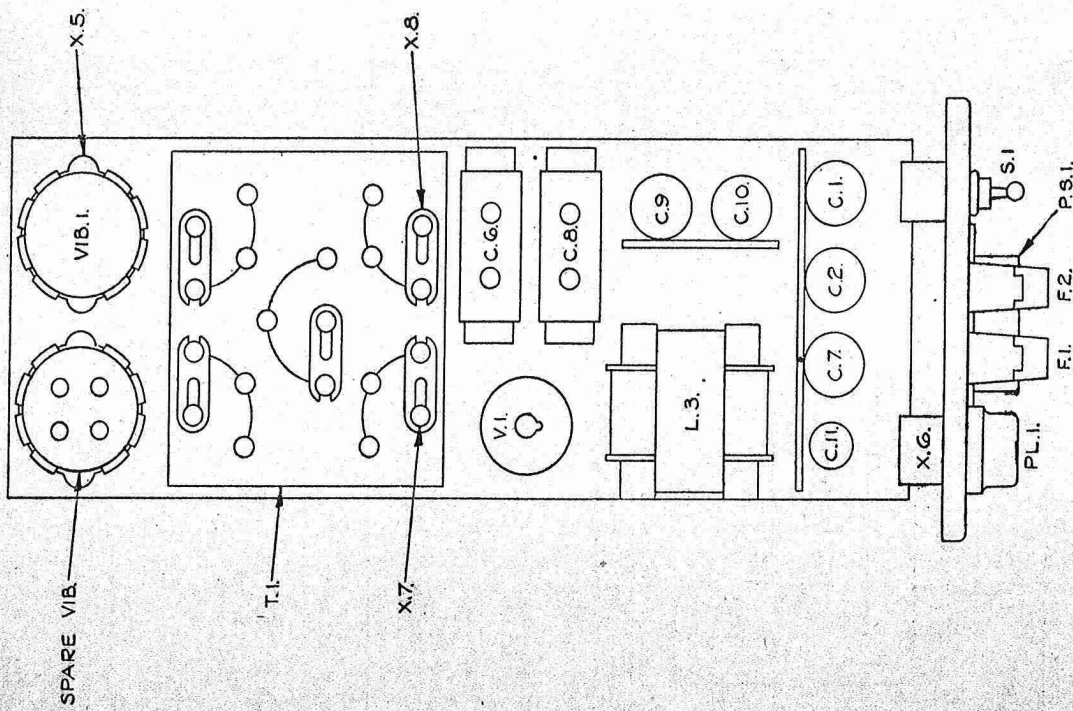


ALTERNATIVE INPUTS.

- 24 V. D.C.
  - 100 V. D.C.
  - 110 V. D.C.
  - 200 V. D.C.
  - 220 V. D.C.
  - 230 V. A.C. S.P. 50~
- OUTPUT
- 240 V. 60 MA D.C.
  - 24 V. I.A.

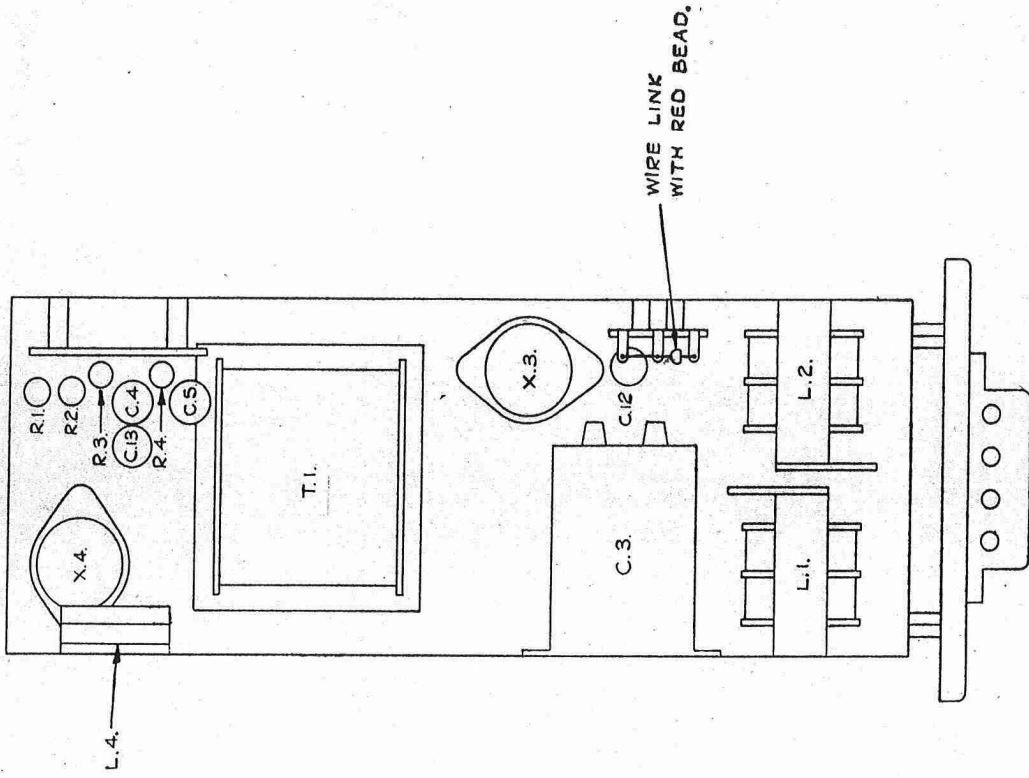
NOTES.

1. THE LINKS V, W, X, Y & Z ARE MOUNTED ON THE TERMINAL BOARD OF THE TRANSFORMER T.1. THE UNIT IS SUPPLIED WITH THESE LINKS CONNECTED FOR 24 V. D.C. WORKING AS SHOWN.
2. FOR THE OTHER D.C. SUPPLIES THE LINKS ARE TO BE CONNECTED TO THE APPROPRIATELY MARKED TERMINALS.
3. FOR 230 V. A.C. SUPPLY, THE LINKS Y & Z ARE TO BE CONNECTED TO THE 220/110V TERMINALS; ALL OTHER LINKS TO REMAIN CONNECTED AS FOR 24 V. D.C.
4. WIRE LINK WITH RED BEAD TO BE REMOVED ON SUPPLY VOLTAGES OTHER THAN 24 V. D.C.
5. EARTH LINK ON HT-OUTPUT LINE TO BE REMOVED WHEN UNIT IS SUPPLYING HT TO RECEIVERS TYPE 579, 700 OR 1012



PLAN.

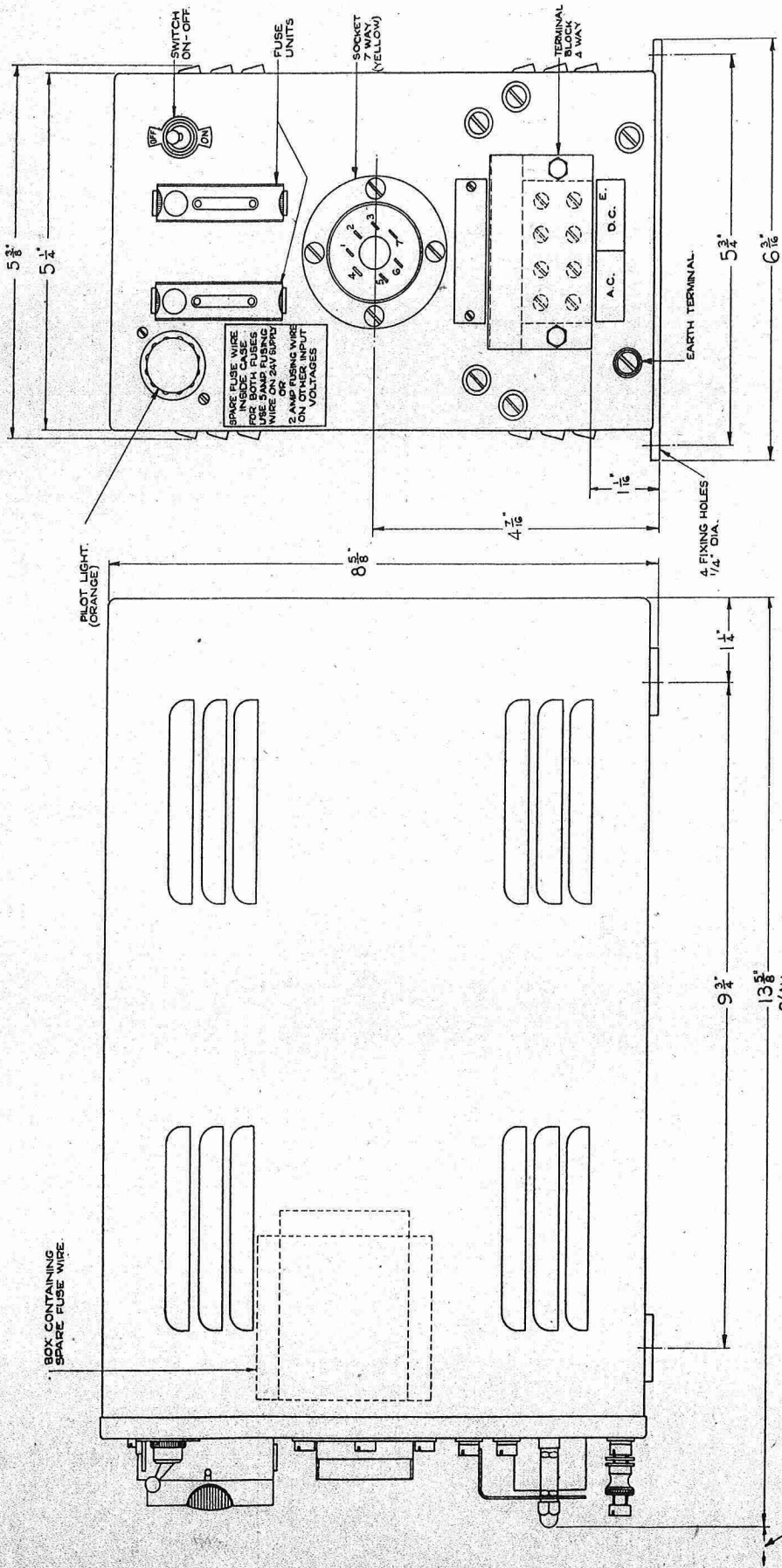
Sheet 1A



UNDERPLAN.

WE/W.13795/B

COMPONENT LOCATION FOR TYPE 889A POWER SUPPLY UNIT



4 - NO 12 X 1" RD. HD. WOODSCREWS SUPPLIED FOR FIXING.

WEIGHT OF UNIT - 22 LBS

WZ/3444

OUTLINE DRAWING OF TYPE 889A POWER SUPPLY UNIT

Sheet 1

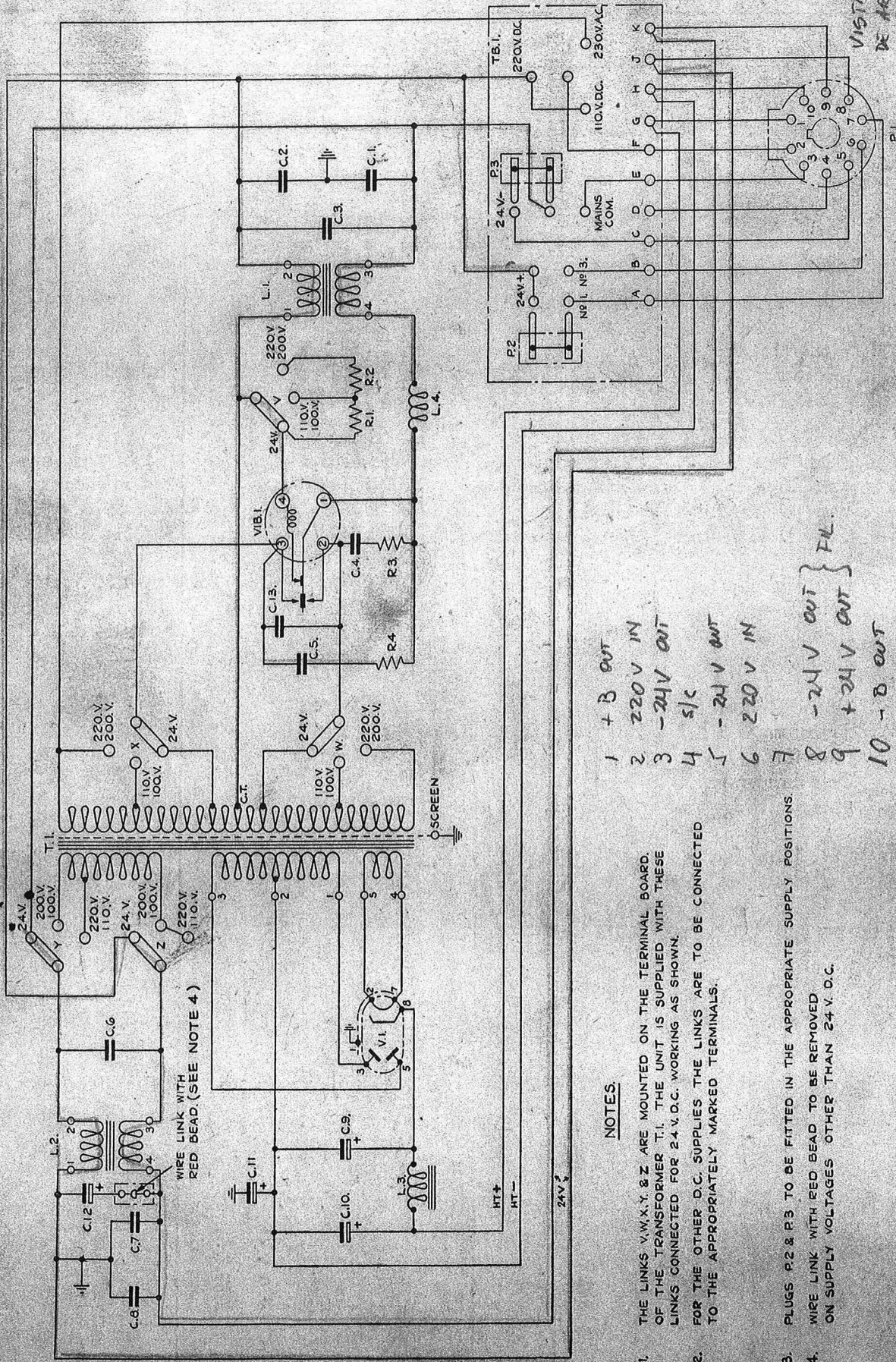
**COMPONENT SCHEDULE**  
**POWER SUPPLY UNIT, TYPE 889A**

WZ.3441/C

Ref.	Description	Value	Drawing No.	Remarks
<b>CONDENSERS</b>				
C1	Condenser	0.5 $\mu$ F. $\pm$ 20% 350 V. D.C. wkg.	W.IS.3955/C Sh. 1. Ref. 12	T.C.C. CP. 47N
C2	Condenser	As C1		
C3	Condenser	2 $\mu$ F. $\pm$ 15% 250 V. D.C. wkg.	W.IS.3781/C Sh. 1. Ref. 1	Dubilier
C4	Condenser	0.1 $\mu$ F. $\pm$ 20% 350 V. D.C. wkg.	W.IS.3955/C Sh. 1. Ref. 7	T.C.C. CP. 45N
C5	Condenser	As C4		
C6	Condenser	As C3		
C7	Condenser	As C1		
C8	Condenser	As C3		
C9	Condenser Electrolytic	8 $\mu$ F. $-20+50\%$ 450V. D.C. wkg.	W.IS.3201/C Sh. 1. Ref. 25	T.C.C. CE. 19P
C10	Condenser Electrolytic	As C9		
C11	Condenser Electrolytic	12 $\mu$ F. 50V. D.C. wkg.	W.IS.3201/C Sh. 1. Ref. 6	T.C.C. CE. 32D
C12	Condenser Electrolytic	As C11		
C13	Condenser	As C4		
<b>FUSE UNITS</b>				
F1	Fuse Unit	See also X9 & X10	W.IS.3142/C Sh. 1. Ref. 5	Slydlok WX.5344
F2	Fuse Unit	As F1		
<b>INDUCTANCES</b>				
L1	Choke, Double	60+60 mH.	W.15204/B Sh. 1. Ed. A	
L2	Choke, Double	As L1		
L3	Choke	8H.	W.IS.2504	
L4	Choke	140 $\mu$ H.	WSK.3203/C Sh. 1. Ed. Q	
<b>LAMPS</b>				
PL1	Lamp. Mes.	12V. 0.2A.	WIS.3181/C Sh. 1. Ref. 5	
<b>SOCKETS</b>				
PS1	Socket, 7 pin		WSK.836 Sh. 1. Ed. L	
<b>RESISTANCES</b>				
R1	Resistance	820 $\Omega$ $\pm$ 10% 12W.	WIS. 2606 Sh. 1. Ref. 2	Welwyn G.V. Mark 3AW. Type AW.3112
R2	Resistance	1,200 $\Omega$ $\pm$ 10% 12W.	WIS. 2606 Sh. 1. Ref. 2	Welwyn G.V. Mark 3AW. Type AW.3112
R3	Resistance	33 $\Omega$ $\pm$ 20% 1/2W.	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R4	Resistance	As R3		

Ref.	Description	Value	Drawing No.	Remarks
S1	SWITCHES Switch D.P. On/Off	250V. 3A.	WIS.3145/C Sh. 1. Ref. 1	Bulgin S.277
T1	TRANSFORMERS Transformer		W.15196 Sh. 1. Ed. A	
V1	VALVES Valve, Type 6X5G			F.W. Rectifier
VIB1	VIBRATORS Vibrator	24V.	WIS.2497 Sh. 1. Ref. 5	Wright & Weaire N.S.24
	MISCELLANEOUS ITEMS			
X1	Fuse Wire	2 amp. Fusing	WIS.3285/C	1 yd. of each. Sup-
X2	Fuse Wire	2 amp. Fusing	Sh. 1. Ref. 8	plied on one card
X3	Valve Holder for V1	Octal.	WIS.1894	Celestion SP8/US.
X4	Valve Holder for VIB.1	4 pin American	WIS.2532	Celestion SP4/US.
X5	Earthing Clip for VIB.1		WIS.2731 Sh. 1. Ref. 1	Wright & Weaire V.105
X6	Lampholder, com- plete with orange lens	M.E.S.	WIS.3226/C Sh. 1. Ref. 4	Arcoelectric S182/22
X7	Terminal Head for Transformer T1		WIS.3843/C Sh. 1. Ref. 1	Bulgin T5
X8	Link for Transformer		2/W.15197/C	
X9	Fuse Cartridge	2 amp. Fusing	WIS.2649/C Sh. 1. Ref. 9	Slydlok 534
X10	Fuse Cartridge	5 amp. Fusing	WIS.2649/C Sh. 1. Ref. 4	Slydlok 534

For  
Tankers  
Only



NOTES

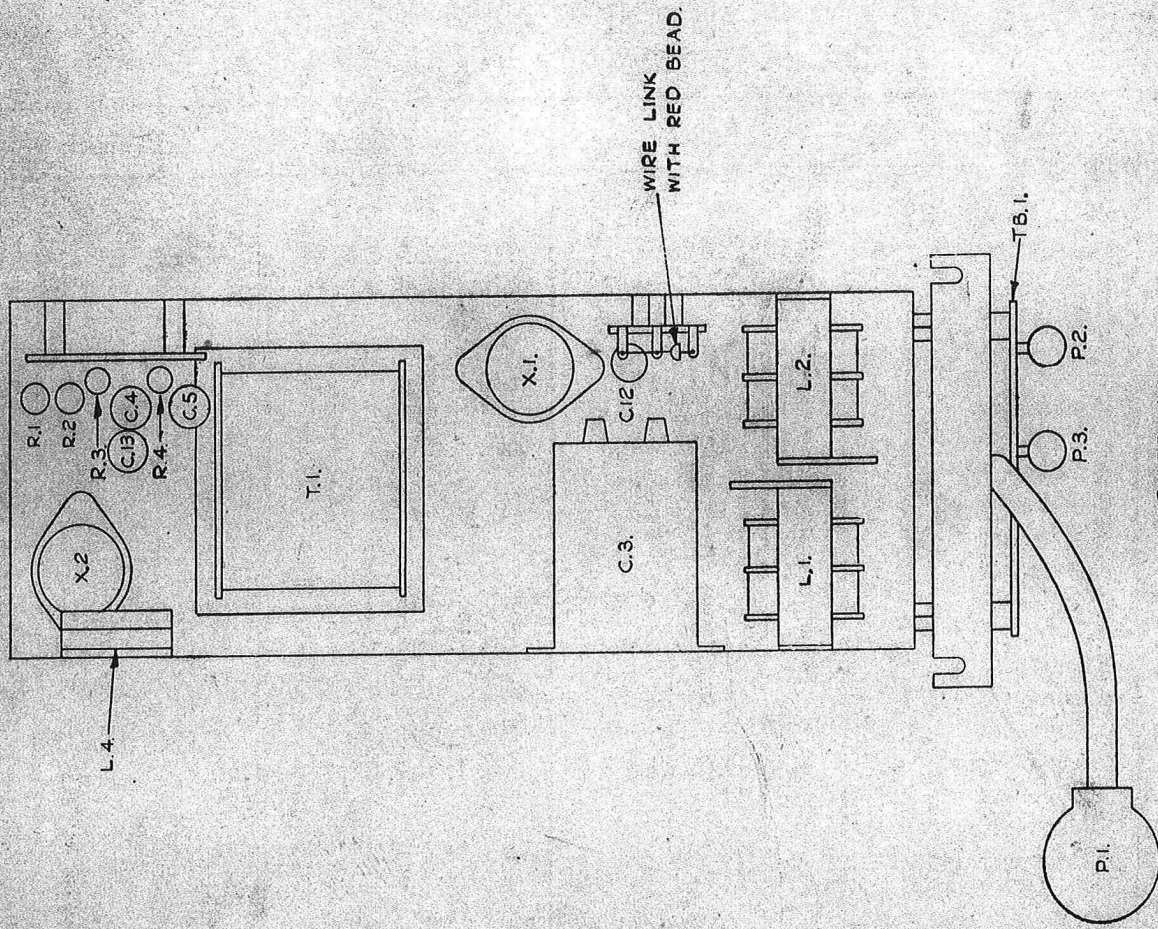
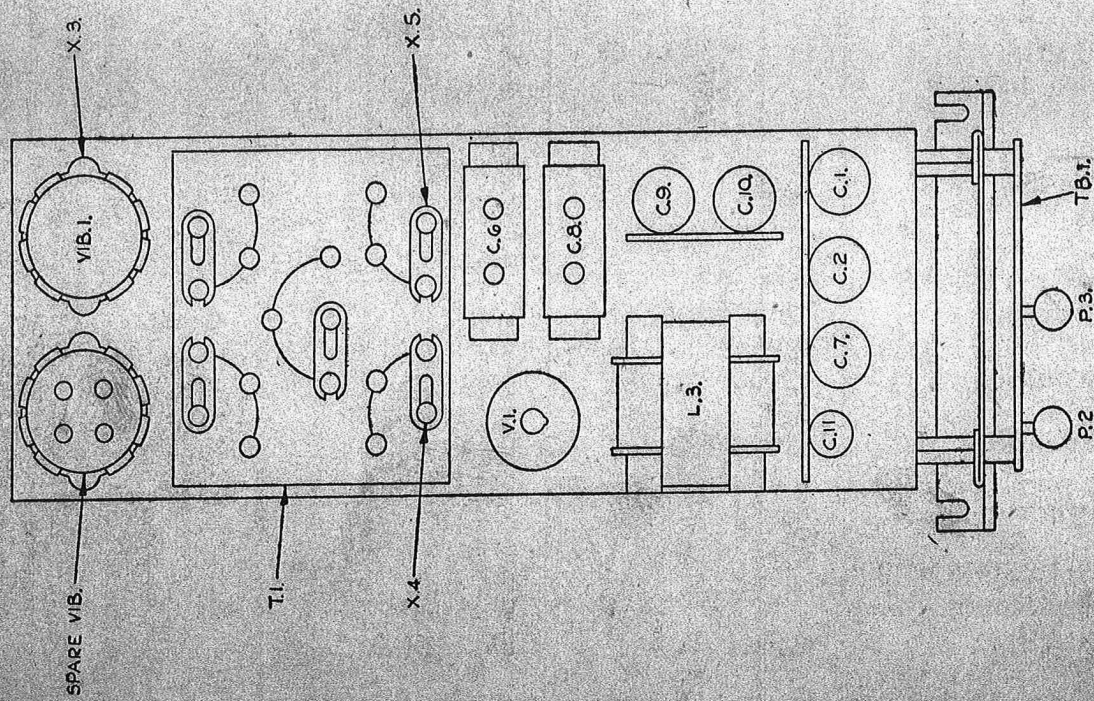
1. THE LINKS V, W, X, Y, & Z ARE MOUNTED ON THE TERMINAL BOARD. OF THE TRANSFORMER T.1. THE UNIT IS SUPPLIED WITH THESE LINKS CONNECTED FOR 24 V. D.C. WORKING AS SHOWN.
2. FOR THE OTHER D.C. SUPPLIES THE LINKS ARE TO BE CONNECTED TO THE APPROPRIATELY MARKED TERMINALS.
3. PLUGS P.2 & P.3 TO BE FITTED IN THE APPROPRIATE SUPPLY POSITIONS.
4. WIRE LINK WITH RED BEAD TO BE REMOVED ON SUPPLY VOLTAGES OTHER THAN 24 V. D.C.

- 1 + B OUT
- 2 220 V IN
- 3 -24V OUT
- 4 5/c
- 5 -24 V OUT
- 6 220 V IN
- 7
- 8 -24 V OUT } Full
- 9 +24 V OUT }
- 10 - B OUT

VISTA DE ARRISA!

WE/15213/B

CIRCUIT DIAGRAM FOR TYPE 966A POWER SUPPLY UNIT



UNDERPLAN.

PLAN.

COMPONENT LOCATION FOR TYPE 966A POWER SUPPLY UNIT



COMPONENT SCHEDULE  
POWER SUPPLY UNIT, TYPE 966A

WZ.3442/C

Ref.	Description	Value	Drawing No.	Remarks
<b>CONDENSERS</b>				
C1	Condenser	0.5 $\mu$ F. $\pm$ 20% 350V. D.C. wkg.	WIS.3955/C Sh. 1. Ref. 12	T.C.C. CP.47N
C2	Condenser	As C1		
C3	Condenser	2 $\mu$ F. $\pm$ 15% 250V. D.C. wkg.	WIS.3781/C Sh. 1. Ref. 1	Dubilier
C4	Condenser	0.1 $\mu$ F. $\pm$ 20% 350V. D.C. wkg.	WIS.3955/C Sh. 1. Ref. 7	T.C.C. CP.45N
C5	Condenser	As C4		
C6	Condenser	As C3		
C7	Condenser	As C1		
C8	Condenser	As C3		
C9	Condenser	8 $\mu$ F. $-20+50\%$ 450V. D.C. wkg.	WIS.3201/C Sh. 1. Ref. 25	T.C.C. CE.19P
C10	Condenser Electrolytic	As C9		
C11	Condenser Electrolytic	12 $\mu$ F. 50V. D.C. wkg.	WIS.3201/C Sh. 1. Ref. 6	T.C.C. CE.32D
C12	Condenser Electrolytic	As C11		
C13	Condenser	As C4		
<b>INDUCTANCES</b>				
L1	Choke, Double	60+60mH.	W.15204/B Sh. 1. Ed. A	
L2	Choke, Double	As L1		
L3	Choke	8H.	W.IS.2504	
L4	Choke	140 $\mu$ H.	WSK.3203/C Sh. 1. Ed. Q	
<b>PLUGS</b>				
P1	Plug. 10 Pin		WIS.171 Sh. 1. Ref. 1	
P2	Plug. 2 Pin Shorting Type		W.11137/B Sh. 1. Ref. 5	
P3	As P2			
<b>RESISTANCES</b>				
R1	Resistance	820 $\Omega$ $\pm$ 10% 12W.	WIS.2606/C Sh. 1. Ref. 2	Welwyn G.V. Mark 3AW. Type AW.3112
R2	Resistance	1,200 $\Omega$ $\pm$ 10% 12W.	WIS.2606/C Sh. 1. Ref. 2	Welwyn G.V. Mark 3AW. Type AW.3112
R3	Resistance	33 $\Omega$ $\pm$ 20% 1/2W.	WIS.3903 Sh. 1. Ref. 5	Erie Type 8
R4	Resistance	As R3		
<b>TRANSFORMER</b>				
T1	Transformer		W.15196 Sh. 1. Ed. A	

Ref.	Description	Value	Drawing No.	Remarks
TB1	TERMINAL BOARDS Tag & Socket Board		W.11137/B Sh. 1. Ed. A	
V1	VALVES Valve Type 6X5G			F.W. Rectifier
VIB.1	VIBRATORS Vibrator	24V.	WIS.2497 Sh. 1. Ref. 5	Wright & Weaire NS.24
X1	MISCELLANEOUS ITEMS Valve Holder for VI	Octal.	WIS.1894	Celestion SP.8/US.
X2	Valve Holder for VIB.1	4 Pin American	WIS.2532	Celestion SP.4/US.
X3	Earthing Clip for VIB.1		WIS.2731 Sh. 1. Ref. 1	Wright & Weaire V.105
X4	Terminal Head for Transformer T1		WIS.3843/C Sh. 1. Ref. 1	Bulgin T5
X5	Link for Transformer		2/W.15197/C	

ADDITIONS AND CORRECTIONS