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Please get in touch with me at archivist@vmarsmanuals.co.uk.

Richard Hankins, VMARS Archivist, Summer 2004

INSTALLING AND OPERATING INSTRUCTIONS FOR TELEGRAPH-TELEPHONE EQUIPMENT

Type CNY.2

Ref. No. T 1800/1

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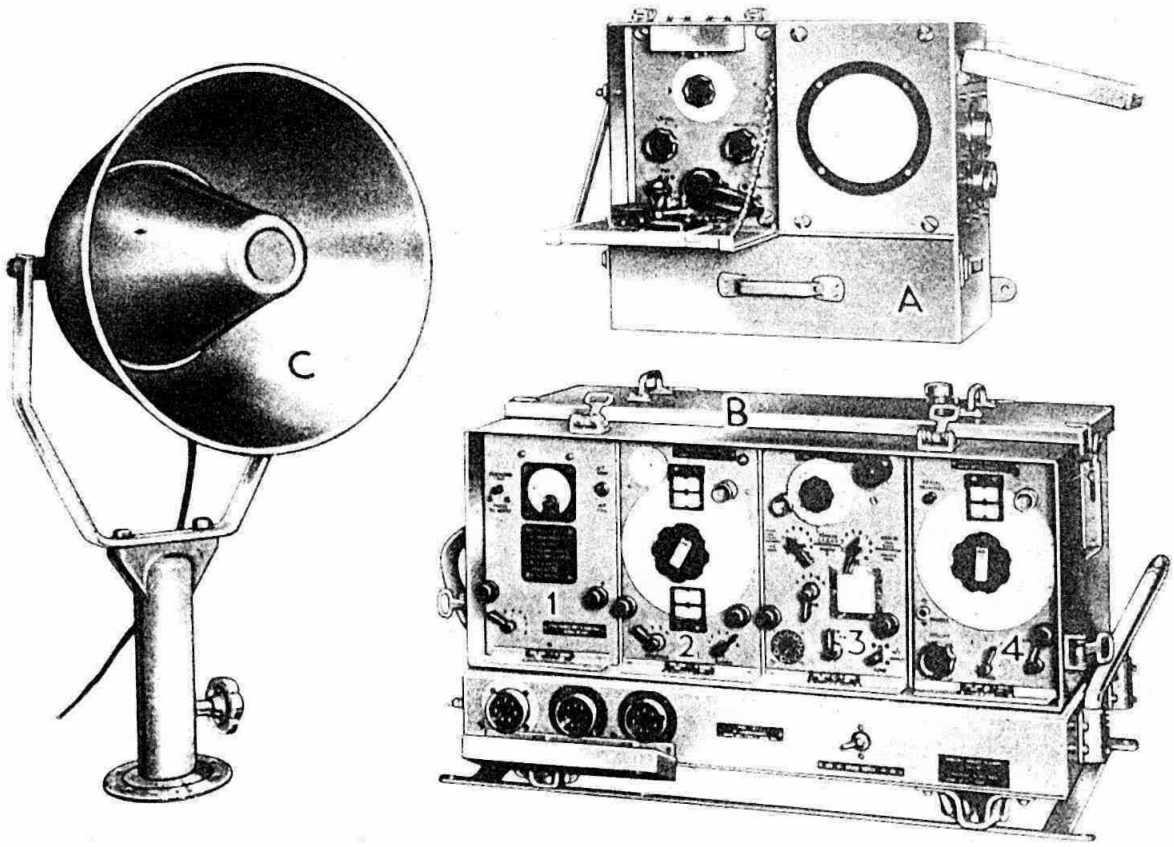


THE COMPLETE EQUIPMENT.

A. Control Unit with internal loudspeaker.
B. Transmitter, Receiver and Power Unit.
C. Hailer Loudspeaker.

1. Power Unit.
2. Drive Unit.
3. Final Stage Unit.
4. Receiver Unit.

CONTENTS.

PAGE

SECTION 5.

OPERATING AND TUNING INSTRUCTIONS.

SECTION 6.

MAINTENANCE, FAULTS AND SPARES.

SECTION 7.

SCHEDULE OF COMPONENT PARTS.

INSTALLING AND OPERATING INSTRUCTIONS FOR TELEGRAPH-TELEPHONE EQUIPMENT

Type CNY.2

INTRODUCTION.

The CNY.2 Telegraph-Telephone Transmitting and Receiving Equipment consists of a comparatively low power transmitter, having continuous frequency coverage over the band 1.5-9 Mc/s, with provision for four " spot " crystal controlled frequencies, and also a receiver with a slightly wider coverage. An additional feature is the provision of a " Hailer " Loudspeaker which can be energized with 10 watts of audio power.

The equipment is suitable for use with a 12 volt or 24 volt Battery or 100/110 and 200/250 volts A.C. 50 c.p.s. mains.

The equipment has been designed primarily for use at sea where limitations of space must be considered. It is equally suitable for use on land as a fixed or mobile station. It can be easily assembled, dismantled and transported, and, when dismantled, consists of only three units, the heaviest of which can be carried comfortably by two men.

The equipment is sprayproof but only the Hailer Loudspeaker is suitable for mounting in the open.

SECTION 1.

BRIEF TECHNICAL DATA

(1) EQUIPMENT.

The Type CNY.2 Transmitter-Receiver-Hailer Equipment consists of :—

(A) Main Unit : containing from left to right :
Power Unit.
Drive Unit.
Final Stage Unit.
Receiver.

(B) Control Unit : containing loudspeaker, and housing the following in a drawer : Microtelephone (Handset), Key, Headphones, Absorption Wavemeter and three spare Vibrators.

(C) Hailer Loudspeaker. A watertight and highly directional unit, complete with a 50-ft. lead and plug.

(D) Interconnecting Cables comprising two screened cables for connecting the Transmitter-Receiver Unit to the Control Unit, and an 8-ft. power supply lead.

The length of Interconnecting Cables will not exceed 25 ft. unless special heavy duty cable is supplied.

(2) TECHNICAL PERFORMANCE.

(A) Transmitter :

Frequency range :	1.5—9 Mc/s.
Master Oscillator (M—O) :	Valve drive over the range of 1.5—9 Mc/s or a choice of 4 crystals anywhere in this band.
Transmission :	By C.W., M.C.W. (1,000 c.p.s. approx.) and Telephony.
Aerial circuit carrier power :	5—8 watts on C.W./M.C.W. and Telephony.
Modulation :	By anode choke method. Depth up to 90%.

Keying :	Up to maximum hand speeds by interrupting magnifier cathode lead. The M—O is not keyed and there is no keying relay.
Reduced power working :	Approximately 1/3 aerial power.

(B) Hailer Loudspeaker :

10 watts of audio power can be delivered to the Hailer Loudspeaker.

(C) Receiver :

Frequency range : 0.4 — 1 Mc/s.
1.5 — 10 Mc/s.
Maximum Output Power : 3.75 watts to loudspeaker.
C.W. and Telephony reception.
Operates Loudspeaker or earpiece of Handset and/or headphones.
Provision for reduced H.T. working to conserve battery consumption.

(D) Power Supply :

Battery, 12 or 24 volts. Maximum Input 115 or 140 watts respectively.
or A.C. Mains 100/110 and 200/250 volts 50 c.p.s. single phase. Maximum Input 140 watts.

(E) Aerial :

Between 30 and 60 feet of single wire as high as possible.

(3) VALVES.

(A) Transmitter :

Master Oscillator	1 VT.60A (Beam Tetrode)
Magnifier	1 VT.60A (Beam Tetrode)
Audio Amplifiers	2 VT.60A (Beam Tetrode)
Aerial Indicator	1 DH.63

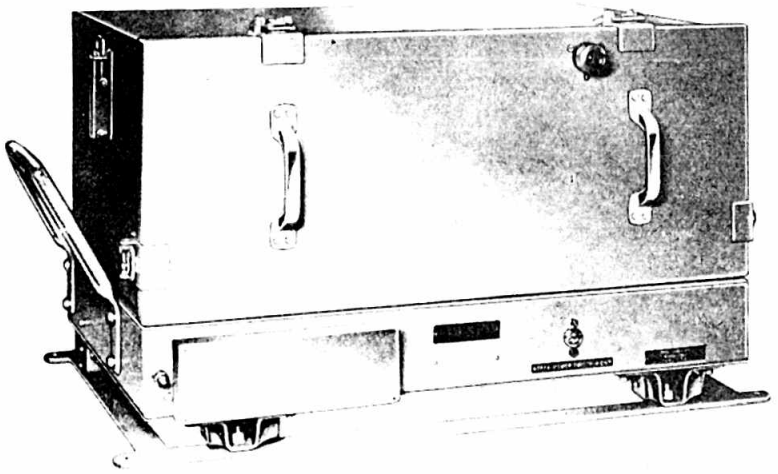
Note : There are certain alternatives of the VT.60A, i.e., the VT.60, 807 and 5B250A. If these are used care must be taken to see that ALL valves used are of the same type. Furthermore, owing to the fact that valves of any one type may take widely different values of filament current, it is necessary to specify that the four valves used should not have filament currents differing by more than 5%.

(B) Receiver :

H.F. Amplifier	1 KTW.61 or 1 KTW.62
Frequency Changer..	1 X.65 or 1 X.66
I.F. Amplifier	1 KTW.61 or 1 KTW.62
2nd Det. L.F. Amplifier and B.F.O. ..	1 DH.63
Output	1 6V6G

(4) SAFETY PRECAUTIONS.

Before any unit is withdrawn from the Main Unit or before the front panel of the Control Unit is removed, the Master Switch on the Main Unit should be set at " OFF." However, once a unit is withdrawn, power is automatically removed from that unit.



TRANSMITTER-RECEIVER UNIT WITH FRONT COVER IN POSITION.

The equipment can be operated with cover in the position shown, or it can be laid on the top of the unit, as shown in the previous illustration.

(5) DIMENSIONS AND WEIGHTS.

The approximate overall dimensions and weights are as follows :

Transmitter-Receiver Unit :
Weight : 110 lbs.
Dimensions : 29½ in. long × 14½ in. high × 15¼ in. deep.

Control Unit (complete) :
Weight : 35 lbs.
Dimensions : 15½ in. long × 13⅞ in. high × 9¾ in. deep.

Interconnecting Cables :
Weight 16 lbs. (for 25 ft. length).

Hailer Loudspeaker :
Weight : 36 lbs.
Dimensions : 30 in. high × 15 in. diam. × 12 in. deep.

When the interconnecting cables are in position the depth of the Transmitter-Receiver Unit is increased by about 5 in. and the length of the Control Unit by about 4½ in.

The length of the Transmitter-Receiver Unit may be reduced, if necessary, to 24½ in. by removing the carrying handles.

SECTION 2.

GENERAL DESCRIPTION

TRANSMITTER-RECEIVER UNIT.

The four units comprising the Transmitter-Receiver Unit slide into the partitioned steel case and are secured by two screws at the bottom front of each unit. Two knobs are fitted to the panel of each unit to facilitate their withdrawal. The case is mounted on a shallow base which in turn is mounted via shock-absorbers, on a frame through which are four holes providing means for fixing down.

A contact strip at the back of the unit engages with a corresponding one at the back of the case, and the connections between these strips are made in the base beneath the case.

Each unit is so made that, should one have to be replaced, a new one can take its place without any mechanical adjustment having to be made.

A lid, fitted with a cork gasket, can be clamped on the front of the case by four catches, thus making the unit sprayproof. The transmitter, after having been set up, can be operated with the lid in position. A special aerial socket is provided in the lid for this purpose. When not in use, the lid can be placed on the top of the case towards the back and fastened down by two catches on the sides of the case. The complete station diagram and a brief summary of the Aerial Circuit tuning instructions are fixed on the inside of the lid.

The whole unit is provided with two strong steel handles which are screwed to the ends of the base. These may be removed, without access to the inside of the base, if space is restricted.

Three sockets on the front of the base are provided for the power supply and control leads and are protected, when not in use, by a hinged sprayproof cover. A colour scheme and interlocking pins ensure that the plugs are placed in the correct sockets. The plugs are clamped to the sockets by locking ring nuts.

The earthbolt is at the left hand end of the base and the aerial terminal is in the top right hand corner of the Final Stage Unit.

A Master Switch for the incoming power supply is situated on the front of the base.

(A) Power Unit.

The conversion between A.C. and D.C. operation is made by transferring a plug inside the unit ; the conversion between 12 and 24 volt D.C. operation involves setting links in *all* the units of the equipment and also changing the type of vibrator and input fuse to suit the input voltage. It must be noted that these alternative types of vibrator and fuse necessary for this conversion are not normally supplied with the equipment, only those suitable for the voltage engraved on the label at the front of each unit being provided.

Spare fuses are carried beneath the deck of this unit.

Reduced Power Working.

By means of the switch on the Power Unit panel the H.T. volts can be reduced from the normal 250 to 175. This is particularly useful when using a battery supply, as it allows considerable saving of power when in the " LOW H.T." position. It is intended to be used mainly for receiver working on " constant watch," but can also be used when transmitting (in which case the aerial power is about 1/3 normal), or for the Hailer Loudspeaker.

Metering.

The various voltages and currents can be measured by a meter on the Power Unit. A switch mounted on the front of the panel provides for selection of the required voltage or current.

Aerial Indicator.

With the meter switch set to " Aerial Indicator," the meter will indicate when the aerial is excited. In this case the meter will read anything up to 4, depending on the frequency. During telegraphy transmission there will be no reading in the " space " condition. On telephony the reading will be nearly constant for all speech input levels.

(B) Drive Unit.

This comprises the Master Oscillator and the Magnifier stage up to and including the anode blocking condenser leading to the aerial circuit.

Four crystals, whose frequencies may lie in any part of the frequency range, can be plugged in beneath the chassis and held in position by rubber straps. Valve drive or control by any one of these crystals may be selected by the CRYSTAL switch. The numbers on the CRYSTAL switch correspond to numbers at the crystal sockets. On valve drive and crystal control the fundamental frequency of the Master Oscillator is used throughout the transmitter frequency range. This range is covered by six separate coils which are selected by the RANGE switch.

The Master Oscillator ranges are as follows :—

Range	Frequency
1	1.5 — 2.0 Mc/s
2	2.0 — 2.7 „
3	2.7 — 3.7 „
4	3.7 — 5.0 „
5	5.0 — 6.8 „
6	6.8 — 9.0 „

The tuning condenser is controlled by a slow motion dial provided with a " quick winding " handle. The dial is engraved in two halves. The upper half carries a logging scale calibrated from 0—10 and three frequency scales for ranges 1, 2 and 3, and the lower half carries the three frequency scales for ranges 4, 5 and 6. Indication is given by the upper and lower cursors respectively. The frequency calibration on this dial is to within 1%. An accurate calibration is not provided since it is intended that required frequencies should be logged before operational use.

To obtain increased accuracy of setting for purposes of logging tune positions, there is a small scale fitted at the top left hand corner, with a pointer driven by means of a silk thread attached to the tuning condenser spindle. The reduction given by this device is 20/1. For one division of the main logging scale this pointer covers one complete revolution of the small scale which is engraved 0—100. The method of reading the logging scale is as follows : If the main scale reads between 5 and 6 and the small scale reads 74, the setting is 574.

The facilities provided by the direct calibration together with the logging scales eliminate the need for cumbersome calibration charts.

Once the Master Oscillator has been set to the required frequency the tuning dial should be clamped by the locking device provided. The Master Oscillator valve is on the left hand side and the Magnifier valve on the right hand side of the unit, looking from the front.

A spare transmitter valve is mounted horizontally in the unit.

(C) Final Stage Unit.

This unit consists of the aerial circuit, Aerial Indicator (central valve), modulator (Audio Frequency Amplifier No. 1) and microphone circuits, and the extra valve (Audio Frequency Amplifier No. 2) connected in parallel with the modulator when the Hailer Loudspeaker is used.

The C.W./M.C.W./Phone switch is also mounted on this unit. A 10-pin socket is provided for either key or microphone, and there is a switch (W/T switch) for use on telegraphy for changing over between " Send " and " Receive."

) **Receiver.**

A superheterodyne circuit with five valves is used. The ganged tuning condenser is controlled by a slow motion drive and the 360 deg. scale is directly calibrated in megacycles. A degree calibration for logging stations is also included. The tuning control may be clamped by means of a locking device if desired.

The additional controls on the panel are the aerial circuit trimmer, range switch, volume control and C.W./Phone switch. A telephone socket giving a listening point for local operation is fitted.

CONTROL UNIT.

This is built into a robust steel case of sprayproof construction.

The unit can be screwed to the bulkhead by means of two metal straps across the back.

An additional U-shaped mounting bracket is provided for use when conditions of severe shock are likely to be encountered.

A door, hinged at the bottom, covers the controls. When it is open it is held horizontally and can form a platform for the key if required.

The panel on which the controls are mounted can be unscrewed and withdrawn on a flexible lead should access be necessary, in which case the Power Switch on the transmitter base must first be set to. " OFF."

Apart from the control switches, the unit comprises the receiver loudspeaker, filament indicator lamps, and a drawer which houses the key, handset, headphones and wavemeter when these are not in use, and the spare vibrators.

The right hand indicator lamp lights when the receiver filaments are " on " and the left hand lamp when the transmitter filaments are " on." When the Control Unit door is open, the amount of light showing can be controlled by a sliding shutter on the bottom of the lamp box. When the door is shut, the light shows through small openings on the top of the unit, thus giving a ready indication.

A socket is provided for headphone reception. When the headphones are in use the loudspeaker is disconnected and the earpiece of the handset is energized. The 10-pin socket is for the key or microphone. The W/T switch operates on telegraphy only.

The Control Unit is connected to the Transmitter-Receiver Unit by two screened cables which plug into the two lower sockets on the right hand side. The upper socket is for the Hailer Loudspeaker output. A colour scheme and interlocking pins ensure that the plugs are placed in the correct sockets. The metal locking rings of the plugs should always be screwed up tightly on the sockets.

Controls.

The main switch has four positions :—

(1) " Off."
(2) " R " — Receiver.
(3) " R & T " — Receiver-Transmitter :
Receiver and Transmitter ready, final control by W/T switch on telegraphy, and by Pressel switch on handset on telephony.
(4) " R & H " — Receiver-Hailer :
Receiver and Hailer ready, final control by Pressel switch on handset.

There are two volume controls, i.e. :—

(A) A three-position control for Receiver loudspeaker, or headphones and earpiece of the handset when these are used at the Control Unit. Position 3 gives maximum volume.
(B) A continuously variable volume control for the Hailer Loudspeaker.

SECTION 3.

TECHNICAL DESCRIPTION

In order to simplify the description reference will be made to the various circuit diagrams and component parts lists to be found at the end of this folder.

In each unit of the equipment the components are numbered up from " 1 " (e.g., C1, C2, etc.).

The Transmitter has two R.F. stages (Master Oscillator and Magnifier) each using one VT.60A or equivalent valve. The M—O and the Magnifier Stage up to and including the anode blocking condenser, is situated in the Drive Unit, while the aerial circuit and the audio-frequency amplifiers are in the Final Stage Unit.

Connections between the Power Unit, Drive Unit, Final Stage Unit and Receiver are numbered from 1—16 on each unit and on the circuit diagrams. Connections between the Main Unit and Control Unit are made by two seven-core screened cables which connect sockets PS2 and PS3 on the Main Unit and PS1 and PS2 respectively on the Control Unit. The screening is used as the earth connection between the two units.

General Method of Control.

The switching in and out of the various stages of the transmitter is done in the cathode leads of the valves concerned by the main switch (S3) in the Control Unit. The operation of the relays (Z1, Z2—Power Unit) which complete the L.T. and H.T. supply circuits, is also controlled by this switch.

General Control Facilities for the Whole Equipment.

A.C./D.C. Power Supply	Changeover plug in Power Unit.
Master Switch for Supply	On front of base of Main Unit.
Off/Rec./Rec. and Transmitter/Receiver and Hailer Selection	At Control Unit only.
Transmitter Tuning	At Transmitter only.
C.W./M.C.W./Phone Control	At Transmitter only.
Telegraphy and Telephony Working	At Main Unit or Control Unit.
Send/Receive Changeover	(A) *Telegraphy* by W/T switch on panel of Final Stage Unit or on Control Unit, at whichever point the key is being used. (B) *Telephony* by Pressel switch on Handset. (C) *Hailer* by Pressel switch on Handset.
Receiver, Output to..	(A) Loudspeaker in Control Unit. (B) Headphones inserted into Receiver Unit (Loudspeaker operative). (C) Headphones inserted into Control Unit (Handset earpiece also energized but Loudspeaker inoperative).
C.W.-Telephony Reception	By C.W./Phone switch on Receiver.
Volume Control	(A) By volume control on Receiver. (B) By Loudspeaker volume control on Control Unit. This controls the Headphones and Handset earpiece when these are used at the Control Unit, or the Loudspeaker.
Hailer Loudspeaker	By Handset at Control Unit *only*, but C.W./M.C.W./Phone switch at the Transmitter must first be set to " Phone."
Full H.T./Low H.T.	By Switch on Power Unit panel.

Note : For correct transmitter working one, but not both, of the two microphone/key sockets (at Transmitter or Control Unit) must be occupied.

Metering.

All the metering is done on a moving coil instrument (M1) in the Power Unit. Suitable shunts are switched into circuit by S2. The following can be read on the meter.

	Multiplication Factor.
Aerial Indicator (mA)	× 1
Magnifier Anode Current (mA)	× 40
„ Grid „ (mA)	× 1
Audio Amplifier No. 1 Anode Current (mA)	× 40
„ „ „ 2 „ „ (mA)	× 40
Master Oscillator Anode Current (mA)	× 10
H.T. Volts	× 100
L.T. Volts	× 10

Note : Since the L.T. volts are measured across the rectifier REC.3 (Power Unit) which is in use only on " R and T " and " R and H," there is no reading of L.T. volts on the " R " position of the Control Unit switch.

Aerial Indicator.

In order to give an indication that the aerial is being energized, an aerial indicating device is incorporated. It consists of a triode (the triode portion of a DH.63 valve, V3, mounted in the Final Stage Unit) whose grid is lightly coupled by C10 and C11 to the transmitter aerial. It derives its H.T. from the main supply through the load resistance (R9), and is biased to cut-off by a voltage obtained between R7 and R8. The filament is in series with a resistance across the L.T. supply. R14 and R15 form the grid-leak. Grid rectification of the R.F. voltage takes place causing anode current to flow. This is measured by the meter and forms the indication.

The device is a non-linear voltage indicator, and covers the wide range of aerial voltages likely to occur on this transmitter with a ratio of indication of about 5/1. The actual value of the meter reading is of no significance and will vary considerably over the frequency band.

On modulation the indication will probably be slightly below that on " C.W." working. In the " space " condition on " C.W." and " M.C.W." working there will, of course, be no indication.

POWER UNIT. (See pages 21, 23 and 25, WE/W.7684/C Sheets 1 to 5).

A label at the front of each unit of the equipment states for what voltage the valve filaments, relays and lamps are wired. For D.C. operation this must correspond to the battery voltage (12 or 24 volt) and for A.C. operation either the 12 or 24 volt connection is suitable, but it must be noted that all units must be wired for the same voltage.

The following internal adjustments must be made for A.C. operation :—

(A) Adjust transformer primary taps to suit supply voltage.
(B) Insert A.C./D.C. plug in Power Unit into " A.C." socket.
(C) Remove D.C. input circuit fuse (F4) and store in holder in front of bracket.

The following internal adjustments must be made for 12 or 24 volt. D.C. operation :—

(A) Insert A.C./D.C. plug in Power Unit into " D.C." socket.
(B) Insert 12 volt or 24 volt vibrator (Z3)* in Power Unit according to supply voltage.
(C) Insert 10 amp. or 7½ amp. fuse (F4)* in Power Unit according to supply voltage.
(D) Adjust 12/24 volt links in *all* units according to battery voltage.
(E) Reverse, if necessary, labels at front of all units according to adjustments made in (D).

*Normally, only one is supplied—either for 12 volt or 24 volt operation.

Drawings illustrating these instructions will be found on page 47 and on a card in the drawer of the Control Unit.

The switch (S1) allows the H.T. volts to be reduced to about 175 volts.

A circuit breaker of the overload type is incorporated in the unit to protect the circuit against damage due to a failure of the vibrator. This device is re-set by means of a push-button on the front panel.

(A) **Alternating Current Mains (A.C.).**

The supply to the transformer (T1) is taken through the main A.C. fuse (F1) which is mounted on the top of the transformer. The appropriate transformer taps are selected by the wander leads which go to the terminal board at the back of the transformer unit.

The transformer supplies (1), the receiver filaments via fuse (F2) and the transmitter filaments via fuse (F3), and the relay (Z2) ; it also supplies the send/receive relay and the Control Unit indicator lamps and (2) H.T. via the selenium rectifiers (REC1) and (REC2) arranged as a bridge rectifier.

The subsequent smoothing circuits consists of C12—15 and L1. Z2 is operated in the " R & T " and " R & H " positions of S3 in the Control Unit.

(B) **Battery (D.C.).**

The operation of the relay (Z1) when S3 (Control Unit) is in the " R," " R & T " positions allows D.C. to pass through the main D.C. input fuse (F4) to the filament, relay and lamp circuits, through smoothing circuits to the vibrator (Z3) and to the transformer. The condenser (C1) and (C2) and resistances (R6) and (R7) across the primary of the transformer are to reduce the sparking at the vibrator contacts.

Adequate smoothing and careful earthing and screening reduce the vibrator noise picked up by the receiver to a minimum.

It should be noted that one side of the D.C. supply is earthed inside the unit (the black lead of input cable), and that, in connecting to the battery, great care should be taken to see that the black lead goes to the earthy side of the battery. If the battery is not earthed then no such precautions are necessary.

DRIVE UNIT (*See page* 29. WE/W.5735/C).

When used as a valve drive this is a shunt-fed Hartley circuit operating on its fundamental frequency over the whole working band of the transmitter. This band is covered by six separate tuning coils (L4—L9) selected by the RANGE switch (S1) which shorts out the unused coils, and tuned by a double-gang condenser (C5). This condenser is shunted by temperature compensating padding condensers (C2) and (C13) mounted above it.

The change-over to crystal control is effected by the CRYSTAL switch (S2). L4—L9 and C2, C13 and C5 are used for the maintaining circuit. The added capacity between anode and grid of the M—O valve (V1) is to give sufficient feedback for satisfactory crystal operation.

The H.T. is derived from the main 250 volt supply through a dropping resistance (R8) and H.F. choke (L2). The circuit is decoupled through C9. The screen is fed from the anode through a stabilizing resistance (R5). There is no cathode bias. The cathode lead is connected to the by-pass condenser (C10) before going out to the Control Unit. R2 is the meter shunt for metering.

The Magnifier valve (V2) is driven from the grid end of the M—O tuned circuit via C4. R10 is the grid leak and R6 the meter shunt for metering the Magnifier Grid Current. The H.T. supply is obtained through the modulation choke (L3) shunted by R9, and an H.F. choke (L1). The circuit is decoupled by C11. The screen is fed from the H.T. through R7 and is connected to the by-pass condenser (C12). The anode current is metered by means of the meter shunt (R1). The cathode lead is connected to the by-pass condenser (C8) before going away to the Control Unit and Final Stage Unit for keying and control purposes. The anode blocking condenser (C6) leads to the aerial circuit in the Final Stage Unit.

FINAL STAGE UNIT (*See page* 33. WE/W.5736/C).

There are two aerial circuits :—

(i) for 1.5 — 3.9 Mc/s.
(ii) for 3.9 — 9.0 Mc/s.

The RANGE Switch (S3) selects the appropriate circuit, i.e., circuit (i) on positions 1—4 and (ii) on position 5.

(i) is a series circuit consisting of a tuning condenser (C1) and padding condensers (C2—C6) and an inductance (L1). The amount of padding capacity in circuit is controlled by positions 1—4 of S3. Adjustment of the coarse coil taps is carried out by Switch B (S1) and the fine coil taps by Switch A (S2).

(ii) This is a tuned circuit made up of C1 and L2. The anode tap is adjusted by switch B (S1) and the aerial coupling tap by switch A (S2).

Modulation.

Anode modulation is used, the valve (A.F. Amplifier No. 1) being V1 and the modulation choke L3 (Drive Unit). The audio input is applied via the microphone transformer (T1). Cathode bias is obtained by R6 in the Final Stage Unit and R7 in the Control Unit. R1 is the meter shunt for cathode metering.

Telephony.

With the C.W./M.C.W./Phone switch (S4) in the " Phone " position the primary of T1 is connected to the key/microphone sockets PS1 in the Final Stage Unit and PS4 in the Control Unit. The microphone is a standard double button type and may be used in either socket.

The polarising voltage is derived from the Control Unit by the cathode current of A.F. Amplifier No. 1 flowing through R7. C1 and C2 are blocking condensers and C3 is a by-pass condenser. For telephony there is no audio input control and the microphone has the full polarising voltage across R7, but on " Hailer " S3 in the Control Unit allows R7 to be used as a potentiometer, thus enabling the polarising voltage to be varied, in which case R7 becomes the " Hailer Volume Control."

Telegraphy.

(A) Modulated Continuous Wave. (M.C.W.).

An oscillation of approximately 1,000 c.p.s. is obtained when S4 is in the M.C.W. position by introducing feedback from the anode of V1 through C7 and R12 to the primary of T1.

(B) Continuous Wave. (C.W.).

On C.W. operation R13 is switched across the secondary of T1 by S4 in order to check any tendency of V1 to oscillate.

Keying.

Keying facilities are provided at the Final Stage and Control Unit and are effected by making and breaking the Magnifier Cathode lead. The Master Oscillator continues to oscillate in the " space " condition and there is no keying relay. On " M.C.W." the back-stop of the key is used to earth the M.C.W. feedback circuit, thus suppressing the audio-frequency oscillation in the " space " condition.

Send/Receive Relay (Z1).

This is situated, together with its associated rectifier (REC.1), in the Final Stage Unit. REC.1 is supplied from the filament circuit.

The relay changes over the aerial and H.T. between the Receiver and Transmitter.

It is controlled on telegraphy by the W/T Switch (S5) on the Final Stage Unit or by S2 on the Control Unit, depending on the location of the key. On telephony it is controlled by the Pressel switch on the Handset. (S5 and S2 are then inoperative.)

Hailer Loudspeaker Circuits.

When the " Hailer " is used, S3 in the Control Unit completes the cathode circuit of the A.F. Amplifier Valve No. 2 (V2 in the Final Stage Unit) and breaks the cathode leads of the R.F. valves. V2 has its anode, screen and grid permanently strapped to the corresponding electrodes of V1, the screens and grids via stabilizing resistances R4, R5, R10, and R11. The cathode resistance of V2 is R6 in the Control Unit. R2 in the Final Stage Unit forms the meter shunt for cathode metering.

The input circuits are as for telephony with the exception that R7 (Control Unit) can now be used as a potentiometer and forms the " Hailer Volume Control."

For Hailer operation the Handset can be used only at the Control Unit.

The audio-frequency output from the Amplifier goes via the blocking condenser (C9, Final Stage) to the Control Unit, where it is switched by S3 before passing to the Hailer transformer (T1) and so out to the Hailer Loudspeaker through socket PS3.

Aerial Circuit Tuning and Purpose of the Wavemeter.

It is possible to tune the aerial circuit to the 2nd harmonic of the M—O frequency, as is the case with any transmitter which covers a wide frequency band, and which does not incorporate elaborate precautions.

The Aerial Circuit Tuning Instructions have been so framed for aerials between the limits specified in Section 4, page 12, that, if they are followed carefully, there should be no chance of tuning to any frequency other than the fundamental.

The wavemeter provided with the equipment may be used to check the radiated frequency if there should be any doubt. For this purpose the necessary coupling may be obtained by placing the wavemeter coil through the 3 in. loop in the aerial lead.

The wavemeter is of the neon absorption type and is normally housed, when not in use, in the drawer of the Control Unit. It consists of a tapped coil, a variable condenser, and a neon tube of the " button " type.

The wavemeter has three ranges which are selected by inserting a small plug in one of three sockets.

The dial of the wavemeter is calibrated directly in frequency (Mc/s) and has the following ranges :

Range	Frequency (Mc/s)
1	1.5 — 2.8
2	2.8 — 5.5
3	5.5 — 9.0

RECEIVER (*See page* 37. WE/W.5737/C).

One stage of amplification at signal frequency incorporating two tuned circuits is used. The aerial circuit is provided with a trimmer which enables accurate ganging to be obtained with aerials of widely varying characteristics.

A triode hexode type frequency changer is used, all three signal frequency circuits being tuned by means of ganged condensers.

In order to keep the radiation from the oscillator within permissible limits, the aerial circuit section is completely insulated from the two-gang assembly tuning the mixer input and oscillator circuits.

The output from the frequency changer at 1.3 Mc/s is fed into an intermediate frequency amplifier comprising four tuned circuits and one amplifying stage. The use of the high value of intermediate frequency, while providing adequate adjacent channel selectivity, enables good second channel rejection to be maintained at the highest signal frequencies.

Dust iron cored inductances are used throughout the signal and intermediate frequency circuits.

A double diode triode valve is used to provide detection, automatic volume control, a stage of audio frequency amplification and the beat frequency oscillator for C.W. reception. Filter circuits are included in order to reduce the harmonics of the beat frequency oscillator as far as possible.

Automatic volume control is applied to both the signal and intermediate frequency amplifiers and is operative only on telephony. The manual volume control operates at low frequency on telephony and controls the gain of the signal and intermediate frequency amplifier valves on C.W. by variation of grid bias.

The audio frequency output from the double diode triode is fed to the grid of the output tetrode via a transformer. The output arrangements include matching at 4 ohms for loudspeaker operation and at 600 ohms for headphones for monitoring.

SECTION 4.

INSTALLING INSTRUCTIONS

EQUIPMENT.

Fix the Transmitter-Receiver Unit firmly by screws through the four holes provided in the fixing frame, using this as a template. Screw the Control Unit, together with its shock absorbing mounting, to the bulkhead or to a shelf.

Each unit should be protected from spray as far as possible.

There are four interconnecting cables :

(1) One 8 ft. power supply lead.
(2) One 50 ft. lead to the Hailer Loudspeaker on deck.
(3) Two screened cables connecting the Main Unit to the Control Unit.

The power supply lead should be inserted into the left hand socket on the Main Unit base, and the two screened leads into the two adjacent sockets. At the Control Unit the Hailer lead plug should be inserted into the upper socket and the screened leads into the lower sockets. A colour scheme on the plugs and sockets identifies the plugs and their respective sockets. Interlocking pins are provided as an extra precaution against wrong connections. The metal rings on the plugs should be screwed tightly on to the sockets because the cable screening is used to earth the Control Unit.

All these leads should be run in such a way as to avoid being damaged.

The Hailer Loudspeaker should be fitted according to local requirements.

Insert the valves, crystals and vibrator if they are not already in position.

Note : When placing a vibrator in its socket the small " pip " on the surface of the holder must come between the two large pins of the vibrator.

The slide of the key should be screwed down in some convenient position. A similar base is already mounted on the platform of the Control Unit.

AERIAL AND EARTH.

The kind of aerial will naturally be very limited on certain types of craft, so the recommendations can only be approximate. However, any aerials of lengths between 30 and 60 feet of single wire of size 7/22, as high as possible and as remote as possible from the superstructure, will be satisfactory.

The lead to the aerial terminal plug from the aerial lead-in insulator or trunk terminal insulator should be of flexible H.T. cable.

A loop, 3 in. in diameter and consisting of three turns, should be made in the aerial about 12 in. from the aerial socket on the set. The loop may be kept in shape by binding the turns together with adhesive tape. The purpose of this loop is to provide coupling for the wavemeter.

The Earth lead should also be of 7/22 wire and should be taken from the earth bolt on the left hand end of the base of the Main Unit and connected, independently of all other earth wires, to an earth bolt in the nearest earth plate which should be at least 8 sq. ft. The length of the earth lead should be as short as possible.

CONNECTION TO POWER SUPPLY.

For method of conversion between A.C. and D.C. operation or between 12 and 24 volt D.C. operation see " Power Unit " on page 8.

(A) To Battery.

1. A label on each unit states the battery voltage for which the unit is suitable.
2. There is no necessity to observe a definite polarity when connecting to the battery.
3. If one terminal of the battery is earthed the *black* lead from the set must be connected to it.
4. If the voltage drop in the power supply is excessive a 14 volt battery should replace the 12 volt battery.

(B) To A.C. supply.

It is necessary to provide the A.C. supply from a switch and fuse box fitted with a 2 amp. fuse. It is also very important to see that the input tap on the transformer (T1), in the Power Unit is set correctly for the particular supply voltage.

SECTION 5.

OPERATING AND TUNING INSTRUCTIONS

For General Control Facilities, see page 7.

OPERATION OF EQUIPMENT.

It is assumed that the interconnecting cables, power supply, aerial and earth have been connected as described in Section 4, page 12.

(1) See that the A.C./D.C. 10-pin plug in the Power Unit is in the correct socket.
(2) Set Power Switch on base of Transmitter-Receiver Unit to " ON " position.
(3) Turn Main Switch on Control Unit to the service required.

(A) **Receiver.**
(1) Set Main Switch on Control Unit to " R."
(2) Plug phones in at Receiver.
(3) Set Receiver to required Range.
(4) Set to " C.W." or " Phone " as required.
(5) Tune the wanted signal.
(6) Adjust aerial trimmer for optimum sensitivity.
(7) Adjust volume.

(B) **Receiver-Transmitter.**
Note 1 : The following Instructions for Transmission are for use after the Transmitter has been tuned—for Tuning Instructions see page 14.
Note 2 : Telegraphy and Telephony transmission can be carried out at the Control Unit or at the Transmitter as required. The following instructions apply in both cases.
Note 3 : IMPORTANT : When the set is being operated from the Control Unit, the key/microphone socket at the Transmitter must not be occupied, and vice versa.

Telegraphy.
(1) Set Main Switch on Control Unit to " R & T."
(2) Set C.W./M.C.W./Phone switch to " C.W." or " M.C.W." as required.
(3) Insert Key plug.
(4) Set W/T switch to " Send " for transmit and to " Receive " for receive.

The Transmitter is now ready for keying.

Telephony.
(1) Set Main Switch on Control Unit to " R & T."
(2) Set C.W./M.C.W./Phone switch to " Phone."
(3) Insert Handset plug.
(4) Press the switch on the Handset to transmit and release it to receive.

If the meter switch is set to " Aerial Indicator," the operator will be able to check whether the aerial is being excited or not. When the transmitter is radiating, the meter may read anything up to 4, depending on the frequency being used. There will be no meter reading on " space " condition, hence the aerial indicator gives a check of the telegraphy transmission. On telephony the indicator will show an approximately steady reading when the aerial is being excited.

(C) **Receiver/Hailer.**
(1) Remove key or Handset plug from Final Stage socket.
(2) Set Main Switch on Control Unit to " R & H."
(3) Set C.W./M.C.W./Phone switch to " Phone."
(4) Insert Handset plug into socket at Control Unit.
Note : When the Hailer Loudspeaker is being used the Handset must not be plugged into the Final Stage socket.

(5) Press Handset switch for Hailer and release for Receiver.
(6) Adjust Hailer volume by control on Control Unit.

If the microphone and hailer loudspeaker are too close, a howl may be set up. Direct the microphone so that the effect is a minimum and reduce the hailer volume control until it ceases.

TUNING ADJUSTMENTS.

Note (i) *: All tuning should be done with the C.W./M.C.W./Phone switch at " C.W." and the particular service required should be selected after tuning.*

Note (ii) *: All settings should be logged for future use.*

1. **Master Oscillator.**

(1) See that the A.C./D.C. 10-pin plug in the Power Unit is in the correct socket.
(2) Set Power Switch on transmitter base to " ON " position.
(3) Insert key plug in socket on Final Stage Unit.
(4) Set Main Switch on Control Unit to " R & T " and wait 30 seconds for the valves to warm up.
(5) Set W/T Switch to " Send " position.
(6) Follow references (A) or (B) below for Valve Drive or Crystal Control respectively.

(A) Valve Drive.

(1) Set CRYSTAL switch to position " L."
(2) Set RANGE switch to the appropriate range.
(3) Set main tuning dial and pointer to the previously logged position for the required frequency. If no logged positions are available then the tuning dial can be set to the engraved calibration which will give a set-up accuracy of within 1 per cent.

Note : There will be no indication of Magnifier Grid Current while the key is not pressed.

(B) Crystal Drive.

(1) Set CRYSTAL switch to the required crystal.
(2) Set RANGE switch to the appropriate range.
(3) Set the meter switch to " Mag. Grid."
(4) Press the key and rotate the main tuning dial until the meter shows peak deflection. This will occur when the dial indicates a frequency approximately the same as the crystal frequency. The RANGE switch may have to be increased by one position before any deflection occurs. The dial calibration does not hold for crystal working.

Note : When tuning in a counter-clockwise direction the meter reading will rise sharply from zero to a peak value and then fall gradually to zero again. (When tuning in a clockwise direction the reverse occurs.)

(5) Adjust the main tuning dial until the meter reads approximately 80% of its peak deflection (on the side of the peak which shows the gradual decrease in meter reading). It is possible that the RANGE switch may have to be increased by one position before this is possible.

Note : The key should be pressed for as short a time as possible, since the aerial circuit will not be in tune and consequently the Magnifier Valve would become overheated.

(6) The position of the tuning dial is not critical and, when found, should be recorded for future operation of that crystal.

2. **Aerial Circuit.**

Note (i) *: Aerial Circuit tuning must always be done on " Full H.T." and with the C.W./M.C.W./Phone switch in the " C.W." position.*

Note (ii) *: All settings should be logged for future use.*

(A) **Frequency 1.5 to 3.9 Mc/s.**

1. Set RANGE switch to correct range, thus :—

Frequency Mc/s.	Range
1.5 — 1.9	1
1.9 — 2.8	2
2.8 — 3.4	3
3.4 — 3.9	4

These ranges depend upon the aerial used and are average values.

2. Set switch " B " according to the range in use.

	Range	B Tap
This initial setting for switch " B " is important as a guard against possible 2nd harmonic tuning.	1	2
	2	5
	3	7
	4	8

3. Set Tuning condenser to 100.
4. Set switch " A " to 1.
5. Set meter switch to " Mag. Anode."
6. Press the key and rotate switch " A " until a pronounced dip occurs in the meter deflection.

Note : Ignore any slight dip which occurs when switch " A " is held between any two positions.

7. If no dip occurs increase switch " B " by one or more taps and rotate switch " A " after each increase until the dip occurs.

Note : If, when using a battery supply, the battery volts are allowed to become too low, this dip will be much less pronounced.

8. Adjust the tuning condenser until the meter deflection shows the bottom of this dip. Should this be outside the range of the condenser when the condenser is at 100, switch " A " should be increased tap by tap until the bottom of the dip can be tuned by the condenser.
   Should the bottom of the dip be beyond the zero end of the condenser, switch " A " should be decreased.

   The circuit is now in tune but the valve is probably incorrectly loaded.

Note : Never keep the key down for longer than is necessary when the circuit is out of tune.

9 The valve is correctly loaded when, at the bottom of the dip, the meter reads between 1.25 and 1.5.

To increase the meter reading to between 1.25 and 1.5, increase " A " tap by tap, retuning the condenser each time, until

(A) the meter dip reads between 1.25 and 1.5—Tuning is complete.
or (B) a further increase in " A " would bring the dip beyond the condenser scale—Tuning is complete.
or (C) " A " has reached " 10 " and still the meter reads low. Then increase " B " by one tap, turn " A " back to " 1 " or " 2 " and retune with the condenser. Continue to increase " A " until (A) or (B) occurs.

To decrease the meter reading to between 1.25 and 1.5, decrease " A " tap by tap, retuning the condenser each time, until

(A) the meter dip reads between 1.25 and 1.5—Tuning is complete.
or (B) a further decrease in " A " would bring the dip beyond the condenser scale —Tuning is complete.
or (C) " A " has reached " 1 " and still the meter reads high. Then decrease " B " by one tap, turn " A " to " 9 " or " 10 " and retune with the condenser. Continue to decrease " A " until (A) or (B) occurs.

Note : 1. *If the battery volts are low, a loading as high as* 1.25 *will not be possible. At some frequencies a loading as high as* 1.25 *may not be possible even when the battery volts are normal.*

2. *A wavemeter has been provided as a means of checking that an harmonic of the M—O frequency has not been tuned. See Operating Instructions, page* 16.

(B) **Frequency 3.9 to 9 Mc/s.**

1. Set RANGE switch to position 5.
2. Set switch " B " according to the frequency.

	Freq. Mc/s.	B Tap
This initial setting for switch " B " is important as a guard against possible 2nd harmonic tuning.	3.9 — 5.0	3
	5.0 — 6.0	6
	6.0 — 7.0	8
	7.0 — 8.0	9
	8.0 — 9.0	10

3. Set Tuning Condenser to 100.
4. Set switch " A " to 1.
5. Set meter switch to " Mag. Anode."
6. Press the key and tune condenser to give a pronounced dip in the meter reading. Tune to the bottom of this dip.

Note : Never keep the key down for longer than is necessary when the circuit is out of tune.

7. The circuit is now in tune but the Magnifier valve is almost certain to be underloaded. The valve is correctly loaded when the meter dip reads between 1.25 and 1.5. To increase the loading to between 1.25 and 1.5, increase " A " tap by tap, keeping the condenser in tune, until

   (A) the meter dip reads between 1.25 and 1.5—Tuning is complete.

   or (B) a further increase in " A " would bring the dip beyond " 0 " or " 100 " on the condenser scale. Then decrease " B " by one tap if the dip approaches " 0 " or increase by one tap if it approaches " 100." Continue to increase " A."

   or (C) " A " reads " 10." Then increase " B " tap by tap, keeping the condenser in tune, until

      (D) the meter dip reads between 1.25 and 1.5—Tuning is complete.

      or (E) a further increase in " B " would bring the dip beyond the condenser scale. In this case the meter may still read under 1.25 but no further loading is possible.

Note : 1. *If the battery volts are low, a loading as high as* 1.25 *will not be possible. At some frequencies a loading as high as* 1.25 *will not be possible, even when the battery volts are normal.*

2. *A wavemeter is provided for checking that a harmonic of the M—O frequency has not been tuned.*

OPERATION OF WAVEMETER.

In order to obtain the necessary coupling between the aerial and the wavemeter a loop has been provided in the aerial lead. To check frequency proceed as follows :—

(1) After tuning the transmitter as previously described switch to the " M.C.W. key down " condition.
(2) Insert the tube of the wavemeter into the loop in the aerial lead as far as the band on the tube. This will give the maximum coupling condition.
(3) Select the appropriate range and rotate the wavemeter dial until the neon tube glows.
(4) Read the frequency directly from the wavemeter dial. This should indicate approximately the same frequency as that to which the Drive Unit scale is set.

It must be appreciated that the purpose of the wavemeter is only to check that the aerial circuit of the transmitter is not tuned to a harmonic of the M—O frequency. The design and calibration of this neon tube wavemeter does not permit of it being used to check the calibration of the Master Oscillator.

SECTION 6.

MAINTENANCE, FAULTS AND SPARES

Maintenance.

In general, little trouble is likely to be experienced with the small number of mechanical moving parts, but periodical inspection should be carried out and accumulations of dust and dirt removed.

The following should have special attention :—

(1) Relay contacts (in the Power Unit and the Final Stage Unit) should be kept clean by lightly drawing a folded piece of fine emery cloth between the contacts.

(2) The pins of the 10-pin plugs (in Power Unit and on key and microphone leads) should be opened up periodically to ensure good contact.

(3) The crystal pins should be opened up when necessary, and the crystals should always be held in position by the rubber straps provided.

Faults.

The more likely faults are tabulated below with corresponding symptoms and remedies :—

Symptom.	*Possible Fault.*	*Remedy.*
No Transmitter filament volts.		
(A) On A.C. working.	(A) Main A.C. input fuse or Transmitter Filament fuse blown.	(A) Replace fuse.
(B) On D.C. working.	(B) Main D.C. input fuse or Transmitter Filament fuse blown.	(B) Replace fuse.
No H.T. volts.		
(A) On A.C. working.	(A) Main A.C. input fuse blown.	(A) Replace fuse.
(B) On D.C. working.	(B) 1. Main D.C. input fuse or 2. Vibrator faulty.	(B) 1. Replace fuse. 2. Replace vibrator.
Flickering or low H.T. Volts on D.C. working.	(1) Battery volts low. (2) Faulty vibrator.	(1) Recharge battery. (2) Replace vibrator.
No Receiver Output.	(1) Main fuse blown. (2) Receiver Filament fuse blown. (3) H.T. or aerial not connected to receiver.	(1) Replace fuse. (2) Replace fuse. (3) Readjust Send/Receive relay contacts.
No M.O. anode current (H.T. volts normal).	(1) Key or microphone plug not making contact in socket. (2) No H.T. on Transmitter.	(1) Open the pins on the plug. (2) Readjust Send/Receive relay contacts.
No Magnifier grid current on crystal operation.	(1) Crystal faulty. (2) Poor contact between crystal pins and holder.	(1) Replace crystal. (2) Open the pins of the crystal holder.
No Magnifier anode current on key-down.	Key plug not making contact in socket.	Open the pins of the plug.
Impossible to tune Final Stage on Range 1—4.	Aerial or earth disconnected.	Check continuity of aerial and earth system.
Impossible to increase the loading on the Magnifier valve by switch A on Range 5.	Aerial or earth disconnected.	Check continuity of aerial and earth system.

Symptom.	*Possible Fault.*	*Remedy.*
Sudden excessive magnifier anode current.	Aerial has become earthed or of low resistance.	Check aerial throughout for possible earth and low resistance of insulators, deposit of dirt, salt, etc.
No output from Hailer Loudspeaker (H.T. and A.F. Amplifier anode currents normal).	Microphone plug not making contact in socket.	Open the pins.
Control Unit lamp not lit.	(1) Lamp blown. (2) Corresponding fuse blown, either Receiver Filament or Transmitter Filament fuse.	(1) Replace lamp*. (2) Replace fuse.
Low anode feed on any valve (when H.T. and L.T. volts are normal).	Faulty valve.	Replace valve.

Note : * *In order to replace a lamp, the lamp box must be taken off by removing the two screws in the centre.*

When inserting a vibrator into its holder the small " pip " on the surface of the holder must come between the two large pins of the vibrator. The vibrator should be lightly tapped before inserting in its holder to remove any dust which may have collected on the contacts.

A vibrator which has failed, due to the contacts partially welding together, can be restored by adopting the following procedure. The vibrator can should be opened by inserting a penknife under the bottom lip and carefully prizing back the metal away from the insulated base. The vibrator stack can then be withdrawn from the can, the contacts gently pulled apart and the contact surfaces very carefully filed flat with a thin magneto file. The vibrator should then be checked for correct working by noting that no sparking, except for an occasional " dust " spark, occurs between the contacts and that a steady D.C. output is obtained from the power unit.

In *no* case must a vibrator be opened unless there is definite proof that it is faulty. Care must be taken to ensure that a fault on the set is definitely due to the vibrator by first checking with one of the spare vibrators supplied and carried in the Control Unit drawer.

Should it be necessary to remove any component from the set, great care should be taken when replacing it not to alter the run of the wiring in any way.

SPARES

All correspondence with the manufacturer regarding spares or complaints should state the Drawing Number and Serial Number of the unit concerned. (These numbers are to be found on the front panel of each unit).

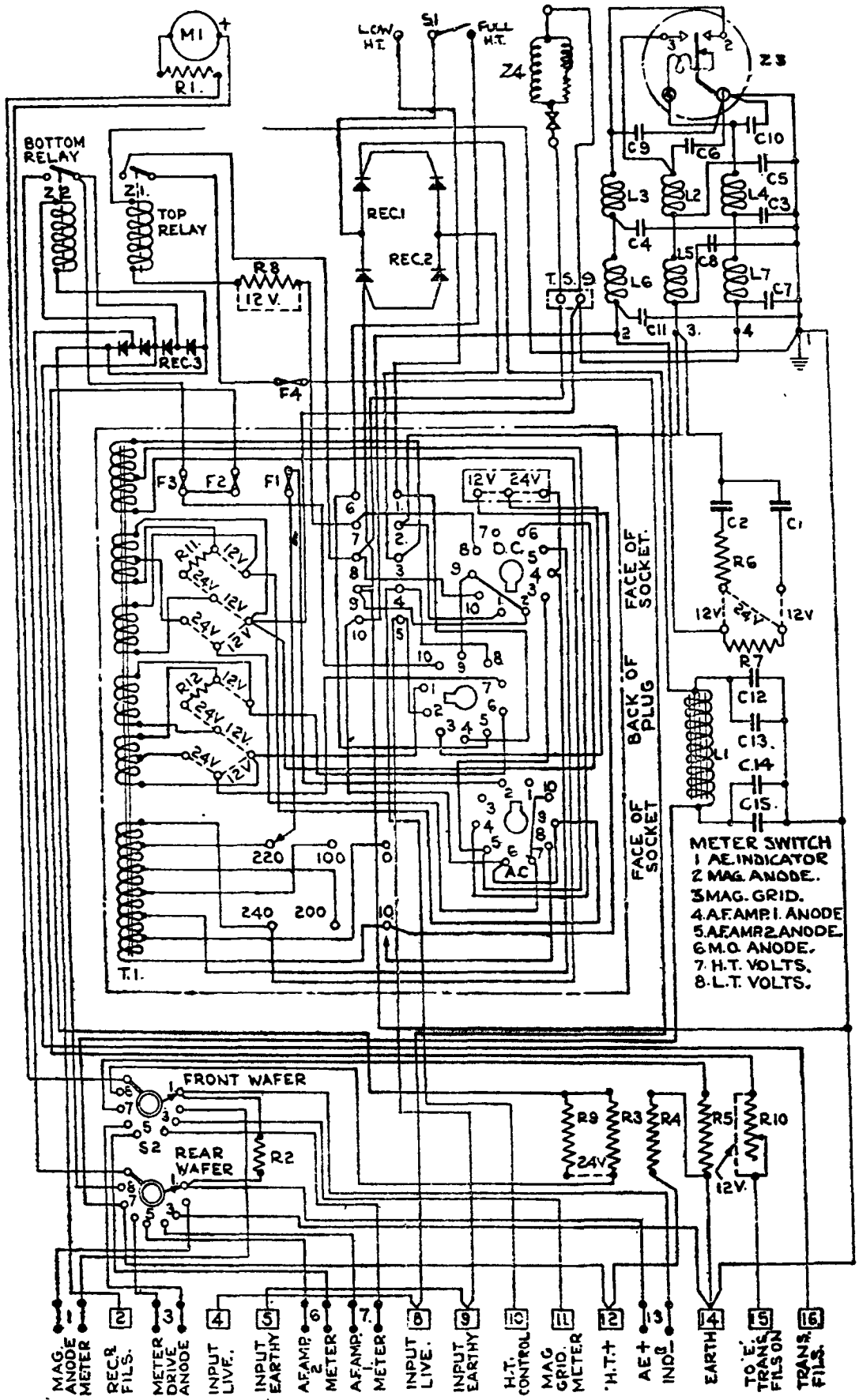
A full list of component parts is given in Section 7, pages 19 to 41.

SCHEDULE OF COMPONENT PARTS

POWER UNIT.

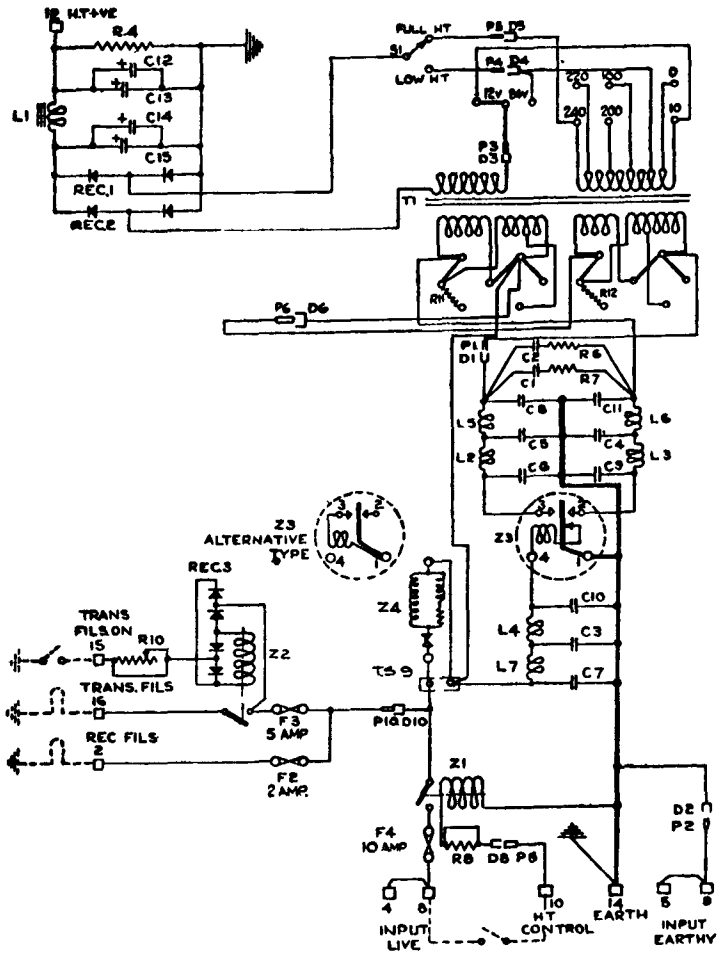
Ref.	*Description.*	*Nominal Value.*	*Drawing No.*
CONDENSERS.			
C1	Primary Buffer	4 μF. 100 v. D.C. Wkg.	WIS.3025 Sh. 1
C2	Primary Buffer	Ditto	
C3	Vibrator Circuit Filter	.01 μF ±15% 750 v. D.C. Wkg.	WIS.1603 Ref. 12
C4	Vibrator Circuit Filter	Ditto	
C5	Vibrator Circuit Filter	Ditto	
C6	Vibrator Circuit Filter	.5 μF 50 50 v. D.C. Wkg.	WIS.2787 Ref. 15
C7	Vibrator Circuit Filter	Ditto	
C8	Vibrator Circuit Filter	Ditto	
C9	Vibrator Circuit Filter	Ditto	
C10	Vibrator Circuit Filter	Ditto	
C11	Vibrator Circuit Filter	Ditto	
C12	H.T. Smoothing	8 μF Electrolytic 500 v. Wkg. 600 v. Limiting	WIS.3299 Ref. 2
C13	H.T. Smoothing	Ditto	
C14	H.T. Smoothing	Ditto	
C15	H.T. Smoothing	Ditto	
FUSES.			
F1	A.C. Input	2 amp.	WIS.2947 Sh. 1, Ref. 9
F2	Receiver Filaments	Ditto	
F3	Transmitter Filaments	5 amp.	WIS.2947 Sh. 1, Ref. 11
F4	D.C. Input { 24 volt	7½ amp.	WIS.3117 Sh. 1, Ref. 1
	{ 12 volt	10 amp.	WIS.3117 Sh. 1, Ref. 2
F4A	Fuse Holder for F1 to F4		WIS.1952
INDUCTANCES AND CHOKES.			
L1	Choke H.T. Smoothing	4.5 Hy. 200 m/A	WSK.11981 Ed. A
L2	Choke, Vibrator Circuit Filter	2.37μH	WDW.680 Ed. A
L3	Choke, Vibrator Circuit Filter	Ditto	
L4	Choke, Vibrator Circuit Filter	Ditto	
L5	Choke, Vibrator Circuit Filter	60μH ± 5%	Former P.22539 Wound to WDW.215 Ed. F
L6	Choke, Vibrator Circuit Filter	Ditto	
L7	Choke, Vibrator Circuit Filter	1,100μH ± 10%	Former WSK.12594 Ed. A WDW.681 Ed. A
METERS.			
M1	Volts, m/Amps., and Ae Indicator	0—5 mA F.S.D. D.C. M.C.	WIS.1867 Sh. 4
PLUGS.			
P1	A.C./D.C. Selection	10-point Plug	WIS.171

Ref.	*Description.*	*Nominal Value.*	*Drawing No.*
PLUG-SOCKETS.			
PS1	A.C. Selection	10-point Socket	WIS.794
PS2	D.C. Selection	Ditto	
RECTIFIERS.			
REC1	H.T. Supply	Half Wave Unit	WIS.2360 Ref. 15
REC2	H.T. Supply	Ditto	
REC3	Trans. Fil. Volts and Trans. Fil. Relay Supply.	Bridge Unit	WIS.2971 Ref. 4
RESISTANCES.			
R1	Meter Series Resistance	150 ohms ± 5% 2 watt	WIS.2630 Ref. 2
R2	Meter Shunt (Ae Indicator)	3,300 ohms ± 10% ½ watt	WIS.2630 Ref. 7
R3	Meter Series (L.T. Volts)	8,200 ohms ± 5% 2 watt	WIS.2630 Ref. 2
R4	Condenser Discharge	100,000 ohms ± 5% 2 watt	WIS.2630 Ref. 2
R5	Meter Series (H.T. Volts)	Ditto	
R6	Primary Buffer	4 ohms ± 10% ½ watt	WIS.2630 Ref. 2
R7	Primary Buffer	Ditto	
R8	Relay Series	150 ohms ± 10% 2 watt	WIS.2630 Ref. 2
R9	Meter Series	13,000 ohms ± 5% ½ watt	WIS.2630 Ref. 7
R10	Rectifier Series	250 ohms ± 5%	WIS.3331/C Sh. 1, Ref. 1
R11	Limiting	0.35 ohms ± 5% 2 watt	W.8386/C Sh. 1, Ed. A
R12	Limiting	Ditto	
SWITCHES.			
S1	H.T. Low/Full	250 v. D.P.C/O 2A.	WIS.3217/C Sh. 1, Ref. 1
S2	Meter Switch	8 Position 2 Wafer	WIS.1197/C Sh. 280
TRANSFORMER.			
T1	Transformer		W.8030 Sh. 1 Ed. A
TERMINAL AND TERMINAL STRIPS.			
TS1	Chassis Contact Strip	16 Pairs of Tags	W.7893/C Ed. A
TS2	Resistance Mounting	For 2 watt Resistance	Sk. 48937 Ref. 2
TS3	Resistance Mounting	For 2 watt Resistance	Ditto
TS4	Vibrator Smoothing		W.8060/C Ed. A
TS5	Vibrator Smoothing		Ditto
TS6	Primary Buffer Circuit		W.7991/C Ed. A
TS7	Transformer Primary		W.8063/C Ed. A
TS8	Transformer Secondary		W.8062/C Ed. A
TS9	Overload Trip Circuit		W.CP.723
RELAYS.			
Z1	D.C. Input	12 v. D.C. Coil	WIS.1829 Ref. 78
Z2	Transmitter Filaments	Ditto	
Z3	Vibrator	12 v. D.C. Supply	WIS.2497 Ref. 4
		24 v. D.C. Supply	WIS.2497 Ref. 5
Z3A	Holder for Z3	4-pin American	WIS.2532
Z3B	Clip for Z3		WIS.2731
Z4	Overload Trip		W.9785 Sh. 1 Ed. A



WE/W.7684/C Sh. 1

DIAGRAM OF CONNECTIONS. POWER UNIT.

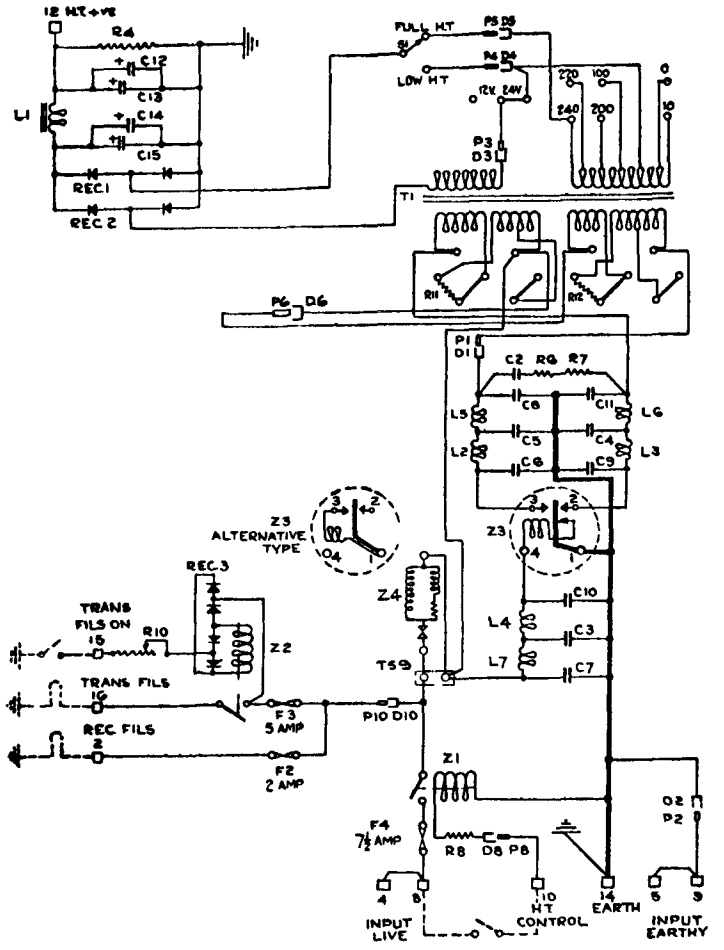


NOTES

'P' REFERS TO 10 PIN PLUG & THE SUFFIX Nº REFERS TO THE PARTICULAR PIN
'D' REFERS TO THE 10 POINT DC SOCKET & THE SUFFIX Nº REFERS TO THE PARTICULAR SOCKET POINT
THE NUMBERED SQUARES THUS □15 REFER TO THE CHASSIS CONTACT STRIP.

WE/W.7684/C Sh. 2

12 VOLTS SUPPLY.



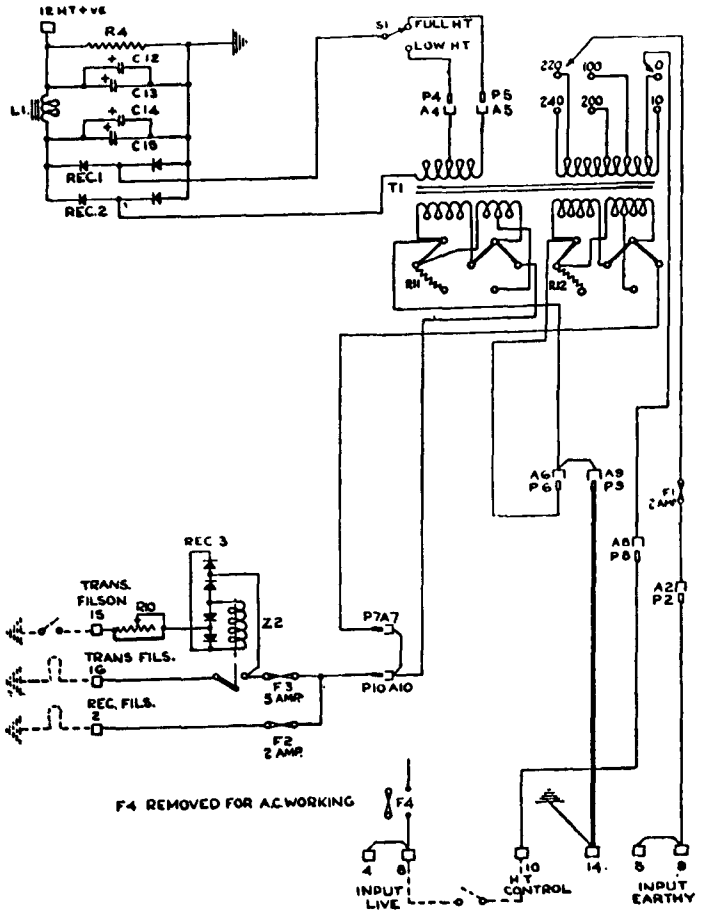
NOTE.-

'P' REFERS TO 10 PIN PLUG & THE SUFFIX Nº REFERS TO THE PARTICULAR PIN
'D' REFERS TO THE 10 POINT DC. SOCKET & THE SUFFIX Nº REFERS TO THE PARTICULAR SOCKET POINT
THE NUMBERED SQUARES THUS □15 REFER TO THE CHASSIS CONTACT STRIP.

WE/W.7684/C Sh. 1

24 VOLTS SUPPLY.

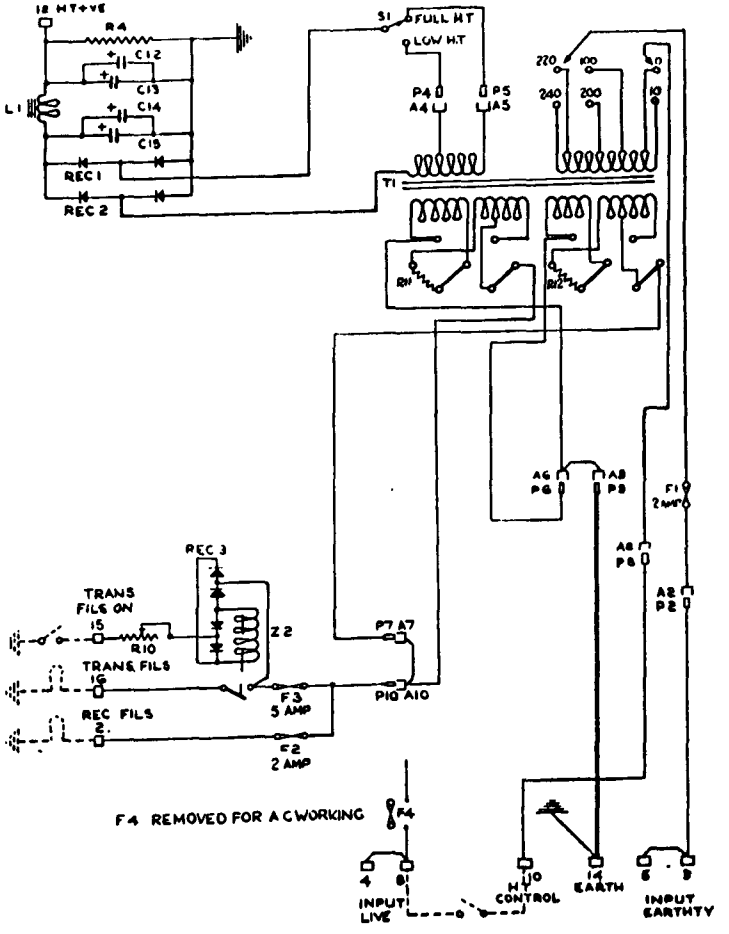
SIMPLIFIED DIAGRAM OF CONNECTIONS, POWER UNIT D.C. SUPPLY.



NOTE:-
'P' REFERS TO 10 PIN PLUG & THE SUFFIX Nº REFERS TO THE PARTICULAR PIN
'A' REFERS TO THE 10 POINT A.C. SOCKET & THE SUFFIX Nº REFERS TO THE PARTICULAR SOCKET POINT.
THE NUMBERED SQUARES THUS □15 REFER TO THE CHASSIS CONTACT STRIP.

WE/W.7684/C Sh. 4

FILAMENTS CONNECTED FOR 12 VOLTS.



NOTE:-
'P' REFERS TO 10 PIN PLUG & THE SUFFIX Nº REFERS TO THE PARTICULAR PIN.
'A' REFERS TO THE 10 POINT A.C. SOCKET & THE SUFFIX Nº REFERS TO THE PARTICULAR SOCKET POINT.
THE NUMBERED SQUARES THUS □15 REFER TO THE CHASSIS CONTACT STRIP.

WE/W.7684/C Sh. 5

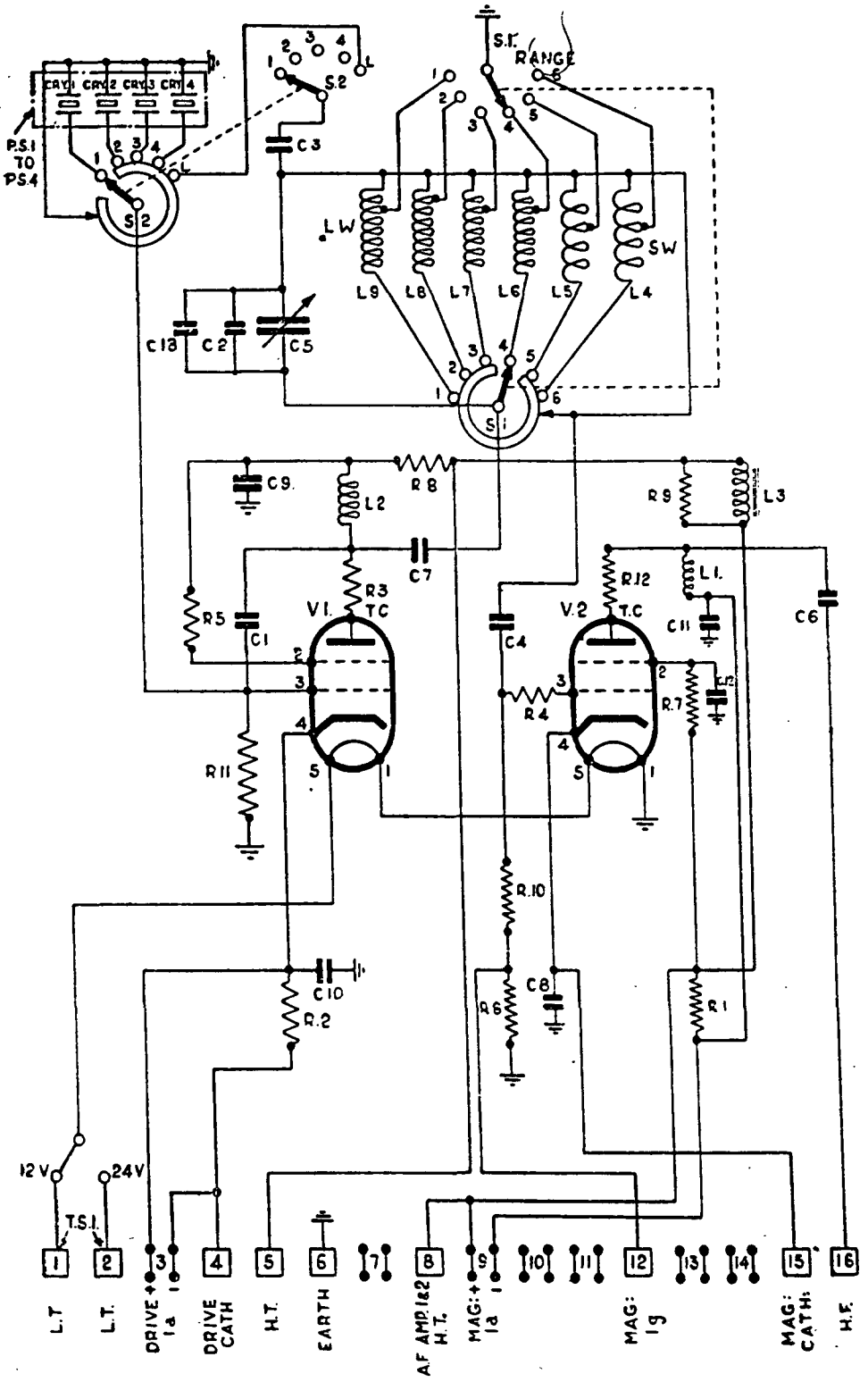
FILAMENTS CONNECTED FOR 24 VOLTS.

SIMPLIFIED DIAGRAM OF CONNECTIONS, POWER UNIT A.C. SUPPLY.

DRIVE UNIT.

Ref.	*Description.*	*Nominal Value.*	*Drawing No.*
CONDENSERS.			
C1	M.O. Anode Grid Feedback	2.5 μμF ± 20%	WIS.2632 Ref. 1
C2	M.O. Padding	40 μμF ± 2.1/2% 500 v. D.C. Wkg.	WIS.1784 Type N608K
C3	M.O. Grid	0.00015 μF ± 15% 750 v. D.C. Wkg.	WIS.1603 Ref. 11
C4	Coupling to Mag. Grid	Ditto	
C5	M.O. Tuning	Var. Air. Two Gang 0.000196 μF. Total	W.7698/C Ref. 1
C6	Mag. Anode Blocking	0.0015 μF ± 15% 750 v. D.C. Wkg.	WIS.1603 Ref. 10
C7	M.O. Anode Blocking	Ditto	
C8	Mag. Cathode By-pass	0.01 μF ± 15% 750 v. D.C. Wkg.	WIS.1603 Ref. 12
C9	M.O. Anode H.F. By-pass	Ditto	Ditto
C10	M.O. Cathode By-pass	Ditto	Ditto
C11	Mag. Anode H.F. By-pass	Ditto	Ditto
C12	Mag. Screen Hold-Down	Ditto	Ditto
C13	M.O. Padding	20 μμF ± 2½%	WIS.1784 Type P120L.
CRYSTALS.			
CRY.1	Crystal Holder Only	2-pin Plug Type	WSK.12135 Ed. A
CRY.2	Crystal Holder Only	Ditto	Ditto
CRY.3	Crystal Holder Only	Ditto	Ditto
CRY.4	Crystal Holder Only	Ditto	Ditto
INDUCTANCES AND CHOKES.			
L1	Mag. Anode H.F. Choke	1.5 mH ± 5%	WIS.1055
L2	M.O. Anode H.F. Choke	Ditto	
L3	Speech Choke	4.5 Hy 200 mA D.C.	WSK.11981 Sh. 1 Ed. A
L4	Tuning Coil	Range 6	WSK.12174 Ed. H
L5	Tuning Coil	Range 5	WSK.12174 Ed. G
L6	Tuning Coil	Range 4	WSK.12174 Ed. E
L7	Tuning Coil	Range 3	WSK.12174 Ed. D
L8	Tuning Coil	Range 2	WSK.12174 Ed. B
L9	Tuning Coil	Range 1	WSK.12174 Ed. A
PLUG SOCKETS.			
PS.1	Crystal Socket		W.7703/C Ed. A
PS.2	Crystal Socket		Ditto
PS.3	Crystal Socket		Ditto
PS.4	Crystal Socket		Ditto
RESISTANCES.			
R1	Mag. Feed Metering	4 ohms ± 2% 1/4 watt	Marconi Type 876
R2	M.O. Feed Metering	16 ohms ± 10% 1/2 watt	WIS.1833 Ref. 9
R3	M.O. Anode Stabiliser	50 ohms ± 10% 1/2 watt	WIS.1833 Ref. 1
R4	Mag. Grid Stabiliser	Ditto	Ditto
R5	M.O. Screen	150 ohms ± 10% 2 watt	WIS.2630 Ref. 2
R6	Mag. Grid Metering	3,300 ohms ± 10% 2 watt	Ditto

Ref.	*Description.*	*Nominal Value.*	*Drawing No.*
R7	Mag. Screen	3,300 ohms ± 10% 2 watt	WIS.2630 Sh. 1 Ref. 2
R8	M.O. Anode Dropping	3,200 ohms ± 10% 30 watt	WIS.2737 Ref. 1
R9	Speech Choke Shunt	10,000 ohms ± 10% 30 watt	Ditto
R10	Mag. Grid Leak	20,000 ohms ± 5% 2 watt	WIS.2630 Ref. 2
R11	M.O. Grid Leak	30,000 ohms ± 5% 2 watt	Ditto
R12	Mag. Anode Stabiliser	150 ohms ± 10% 2 watt	Ditto
SWITCHES.			
S1	Range (M.O.)	6 Positions 2 Wafers	WIS.1197 Sh. 191
S2	Crystal	5 Positions 2 Wafers	WIS.1197 Sh. 179
TERMINALS AND TERMINAL STRIPS.			
TS1	Chassis Contact Strip	16 Pairs of Tags	W.7893/C Ed. A
VALVES AND VALVE HOLDERS.			
V1	M.O.		Type VT.60A
V2	Magnifier		Ditto
	Valve Holder for V1	5-pin American	WIS.2454
	Valve Holder for V2	Ditto	Ditto
	Valve Tensioners		WIS.3327/C Sh. 1 Ref. 1



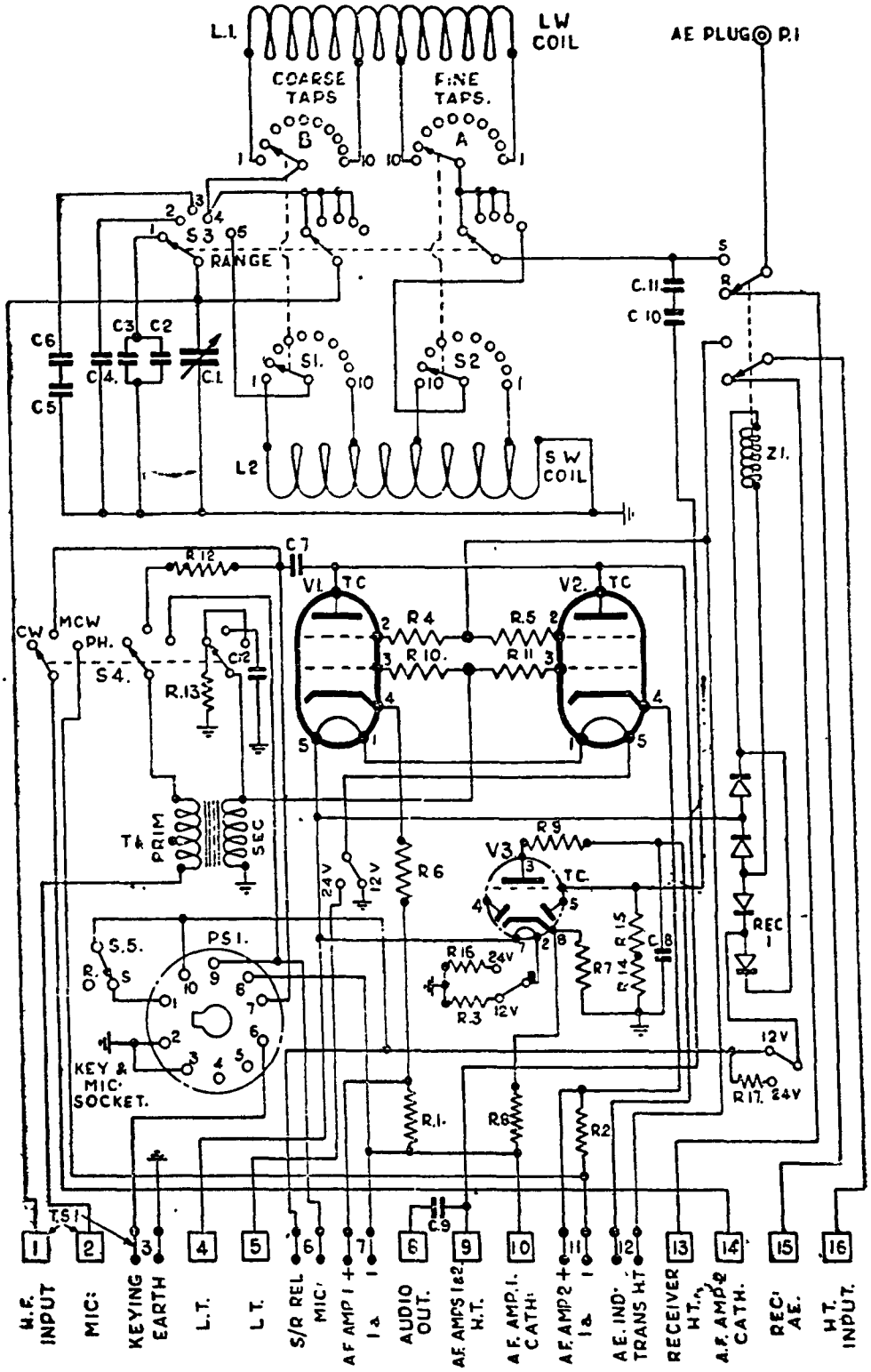
WE/W.5735/C Sh. 2

DIAGRAM OF CONNECTIONS. DRIVE UNIT.

FINAL STAGE UNIT.

	Description.	*Nominal Value.*	*Drawing No.*
CONDENSERS.			
C1	Aerial Tuning	Var. Air. Two Gang 0.000196 μF Total	WIS.2700
C2	Ae. Tuning Padder	0.00015 μF ± 15% 750 v. D.C. Wkg.	WIS.1603 Ref. 11
C3	Ae. Tuning Padder	Ditto	Ditto
C4	Ae. Tuning Padder	Ditto	Ditto
C5	Ae. Tuning Padder	Ditto	Ditto
C6	Ae. Tuning Padder	Ditto	Ditto
C7	M.C.W. Note Oscillator	0.0015 μF ± 15% 750 v. D.C. Wkg.	WIS.1603 Ref. 10
C8	Ae. Indicator H.F. By-pass	Ditto	WIS.1603 Ref. 10
C9	Hailer Coupling	1 μF ± 15% 400 v. D.C. Wkg.	WIS.2701
C10	Ae. Indicator Coupling	5 μμF ± 10% 500 v. D.C. Wkg.	WIS.1784 Type P.120K
C11	Ae. Indicator Coupling	Ditto	Ditto
C12	Note Oscillator Tuning	0.0003μF ± 15% 750 v. A.C. Test	WIS.2442
INDUCTANCES AND CHOKES.			
L1	Aerial (Long Wave)		WSK.12156 Ed. A
L2	Aerial (Short Wave)		WSK.12155 Ed. A
PLUGS.			
P1	Aerial Plug (Shrouded)	Single Point	WSK.12241 Ed. A
PLUG SOCKETS.			
PS1	Mic. and Key	10 Point	WIS.794
RECTIFIER.			
REC.1	Relay Supply		WIS.2971 Ref. 5
RESISTANCES.			
R1	A.F. Amp. No. 1 Meter Shunt	4 ohms ± 2% 1/4 watt	Marconi Type 876
R2	A.F. Amp. No. 2 Meter Shunt	Ditto	Ditto
R3	V3 Fil. Dropping	18 ohms ± 10% 30 watt	WIS.2737 Ref. 1
R4	A.F. Amp. No. 1 G2 Stabiliser	47 ohms ± 10% 1/2 watt	WIS.2630 Ref. 7
R5	A.F. Amp. No. 2 G2 Stabiliser	Ditto	Ditto
R6	A.F. Amp. No. 1 Cathode	47 ohms ± 10% 2 watt	WIS.2630 Ref. 2
R7	V3 Cathode Bias	3,300 ohms ± 10% 2 watt	Ditto
R8	V3 Cathode Bias	Ditto	Ditto
R9	V3 Anode Dropping	10,000 ohms ± 10% 2 watt	Ditto
R10	A.F. Amp. No. 1 G1 Stabiliser	Ditto	Ditto
R11	A.F. Amp. No. 2 G1 Stabiliser	Ditto	
R12	M.C.W. Note Oscillator	100,000 ohms ± 20% ½ watt	WIS.2630 Ref. 7

Ref.	*Description.*	*Nominal Value.*	*Drawing .:*
R13	Mic. Transf. Loading	100,000 ohms ± 20% ½ watt	WIS.2630 Ref. 7
R14	V3 Grid Leak	220,000 ohms ± 10% 2 watt	WIS.2630 Ref. 2
R15	V3 Grid Leak	Ditto	Ditto
R16	V3 Filament Series	60 ohms ± 10% 12 watt	WIS.2606 Ref. 2
R17	Z1 Relay Series	Ditto	Ditto
SWITCHES.			
S1	Aerial Taps (Coarse)	10 Positions 2 Wafers	WIS.1197/C Sh. 279
S2	Aerial Taps (Fine)	Ditto	Ditto
S3	Range	5 Positions 3 Wafers	WIS.1197 Sh. 216
S4	C.W., M.C.W. and Phone	3 Positions 2 Wafers	WIS.1197 Sh. 192
S5	W/T Switch (S/R)		IS.52 Ref. 3A
TRANSFORMER.			
T1	Microphone		WIS.71 Ed. B
TERMINALS AND TERMINAL STRIPS.			
TS.1	Chassis Contact Strip	16 Pairs of Tags	W.7893/C Ed. A
VALVES AND VALVEHOLDERS.			
V1	A.F. Amp. No. 1		Type VT.60A
V2	A.F. Amp. No. 2		Type VT.60A
V3	Aerial Indicator		Type DH.63
	Valveholder for V1	5-pin American	WIS.2454
	Valveholder for V2	Ditto	Ditto
	Valveholder for V3	8-pin International Octal	WIS.1894
	Valve Tensioners for V1 and V2		WIS.3327/C Sh. 1 Ref. 1
RELAYS.			
Z1	Send-Receive		WSK.2110 PS.8320/AW



WE/W.5736/C Sh. 2

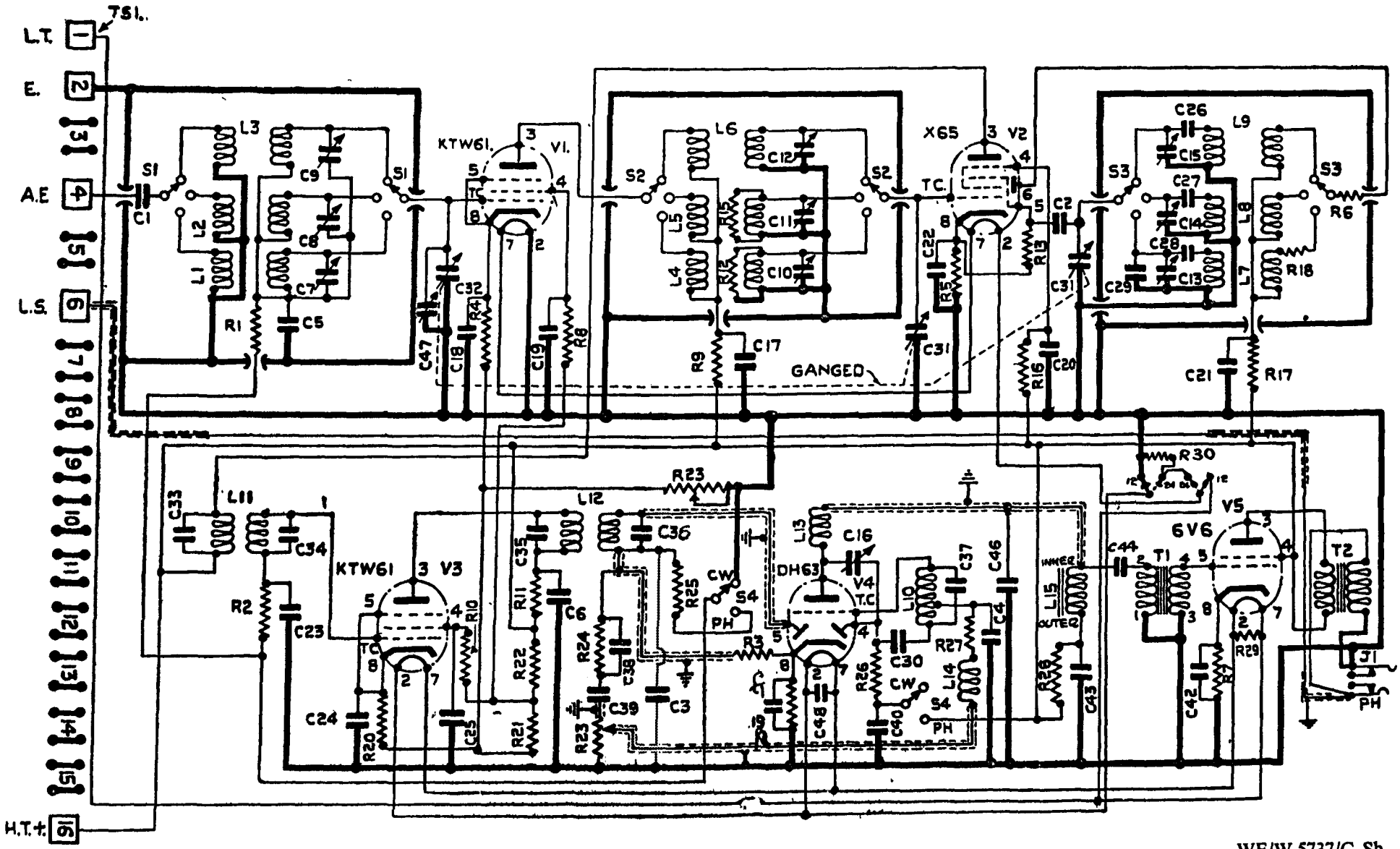
DIAGRAM OF CONNECTIONS. FINAL STAGE UNIT.

RECEIVER UNIT.

Ref.	*Description.*	*Nominal Value.*	*Drawing No.*
CONDENSERS.			
C1	Aerial Coupling	100 $\mu\mu$F ± 20% 350 v. D.C. Wkg.	WIS.2442
C2	1st Osc. Grid Condenser	Ditto	Ditto
C3	Diode Load By-pass	Ditto	Ditto
C4	B.F.O. Hold-Down	Ditto	Ditto
C5	H.F. Grid Decoupling	0.1 μF 350 v. D.C. Wkg.	WIS.2706 Sh. 1
C6	I.F. Anode Decoupling	Ditto	Ditto
C7	Range 1 Aerial Ind. Trimmer	4—21 $\mu\mu$F	WSK.13175/A Ref. 5
C8	Range 2 Aerial Ind. Trimmer	Ditto	Ditto
C9	Range 3 Aerial Ind. Trimmer	Ditto	Ditto
C10	Range 1 Det. Ind. Trimmer	Ditto	Ditto
C11	Range 2 Det. Ind. Trimmer	Ditto	Ditto
C12	Range 3 Det. Ind. Trimmer	Ditto	Ditto
C13	Range 1 Osc. Ind. Trimmer	Ditto	Ditto
C14	Range 2 Osc. Ind. Trimmer	Ditto	Ditto
C15	Range 3 Osc. Ind. Trimmer	Ditto	Ditto
C16	B.F.O. React. Control	Ditto	Ditto
C17	H.F. Anode Decoupling	0.1 + 0.1 + 0.1 μF ± 15% 250 v. D.C. Wkg.	WIS.2708 Ref. 2
C18	H.F. Cathode By-pass		
C19	H.F. Screen Decoupling		
C20	Mixer Screen Decoupling	Ditto	Ditto
C21	1st Osc. Anode Decoupling		
C22	Mixer Cathode By-pass		
C23	I.F. Grid Decoupling	Ditto	Ditto
C24	I.F. Cathode By-pass		
C25	I.F. Screen Decoupling		
C26	Range 3 Osc. Tracker	1,500 $\mu\mu$F ± 2% 350 v. D.C. Wkg.	WIS.1565 Ref. 23
C27	Range 2 Osc. Tracker	600 $\mu\mu$F ± 2% 250 v. D.C. Wkg.	WIS.185 Ref. 5
C28	Range 1 Osc. Tracker	200 $\mu\mu$F ± 2% 250 v. D.C. Wkg.	WIS.185 Ref. 10
~~C29~~	Range 1 Osc. Tuning	30 $\mu\mu$F ± 15%	WIS.1068
C30	B.F.O. Reactor Cond.	Ditto	Ditto
C31	1st Det. and Oscillator Tuning	2 Gang Var. Air. 487 $\mu\mu$F Sweep	WIS.2829 Ref. 1
C32	Aerial Tuning	Single Gang Var. Air. 487 $\mu\mu$F Sweep	WIS.2828 Ref. 1
C33	I.F. Tuning	200 $\mu\mu$F ± 2% 350 v. D.C. Wkg.	WIS.2738 Ref. 1
C34	I.F. Tuning	Ditto	Ditto
C35	I.F. Tuning	Ditto	Ditto
C36	I.F. Tuning	Ditto	Ditto
C37	B.F.O. Tuning	200 $\mu\mu$F ± 2% 350 v. D.C. Wkg.	WIS.2738 Ref. 1
C38	L.F. Corrector	300 $\mu\mu$F ± 15% 350 v. D.C. Wkg.	WIS.2442

Ref.	*Description.*	*Nominal Value.*	*Drawing No.*
C39	Audio Coupling	0.01 μF 350 v. D.C. Wkg.	W.5990/A Ref. 2
C40	Diode Decoupling	Ditto	WSK.13179/A Re
C41	2nd Det. Cathode By-pass	25 μF 25 v. D.C. Wkg.	WIS.2569 Ref. 5
C42	Output Cathode By-pass	Ditto	WIS.2569 Ref. 5
C43	2nd Det. Anode Decoupling	0.5 μF 350 v. D.C. Wkg.	WIS.2787 Ref. 18
C44	Audio Coupling	2,000 $\mu\mu$F $\pm$ 2% 350 v. D.C. Wkg.	WIS.1565 Ref. 4
C46	B.F.O. H.F. Decoupling	2,000 $\mu\mu$F $\pm$ 20% 350 v. D.C. Wkg.	WIS.2738 Ref. 3
C47	Aerial Trimmer	25 $\mu\mu$F Var. Air.	WIS.993 Ref. 10
C48	2nd Det. Fil. By-pass	0.1 μF 350 v. D.C. Wkg.	WIS.2787 Ref. 6
RESISTANCES.			
R1	H.F. Grid Decoupling	1 megohm $\pm$ 20% 1/3 watt	WIS.2630 Ref. 7
R2	I.F. Grid Decoupling	Ditto	Ditto
R3	Diode Load	Ditto	Ditto
R4	H.F. Cathode	330 ohm $\pm$ 20% 1/3 watt	Ditto
R5	Mixer Cathode	Ditto	Ditto
R6	1st Osc. Equalising	Ditto	Ditto
R7	Output Cathode	Ditto	Ditto
R8	H.F. Screen	2,200 ohm $\pm$ 20% 1/3 watt	Ditto
R9	H.F. Anode	Ditto	Ditto
R10	I.F. Screen	2,200 ohms $\pm$ 20% 1/3 watt	Ditto
R11	I.F. Anode	Ditto	Ditto
R12	Range I, Det. Damping	100,000 ohms $\pm$ 20% 1/3 watt	Ditto
R13	1st Osc. Grid Leak	47,000 ohms $\pm$ 20% 1/3 watt	Ditto
R15	Range II, Det. Damping	22,000 ohms $\pm$ 20% 1/3 watt	Ditto
R16	Mixer Screen	33,000 ohms $\pm$ 20% 1/3 watt	Ditto
R17	1st Osc. Anode	Ditto	Ditto
R18	1st Osc. Equalising	1,000 ohms $\pm$ 20% 1/3 watt	Ditto
R19	2nd Det. Cathode	Ditto	Ditto
R20	I.F. Cathode	330 ohms $\pm$ 20% 1/3 watt	Ditto
R21	I.F. Screen Potent	10,000 ohms $\pm$ 20% 1 watt	WIS.2630 Ref. 3
R22	I.F. Screen Potent	22,000 ohms $\pm$ 20% 2 watt	Ditto

Ref.	*Description.*	*Nominal Value.*	*Drawing No.*
R23	Volume Control	Potentiometer 2 Gang 1 megohm Log and 2,000 ohms Linear	WIS.2599 Ref. 3
R24	Audio Load	470,000 ohms ± 20% 1/3 watt	WIS.2630 Ref. 7
R25	Diode Load	Ditto	Ditto
R26	Diode Load	1 megohm ± 20% 1/3 watt	Ditto
R27	2nd Det. Leak	10,000 ohms ± 20% 1/3 watt	Ditto
R28	2nd Det. Anode	Ditto	Ditto
R29	Fil. Dropping	40 ohms ± 5% 6 watt	WIS.2606 Ref. 1
R30	L.T. Volt Dropping	40 ohms ± 15% 6 watt	WIS.2606 Ref. 1
INDUCTANCES AND CHOKES.			
L1	Tuning Coil (Ae)	Range 1	WQ.4330 Sh. 1 Ref. 6
L2	Tuning Coil (Ae)	Range 2	WQ.4330 Sh. 1 Ref. 8
L3	Tuning Coil (Ae)	Range 3	WQ.4330 Sh. 1 Ref. 7
L4	Tuning Coil (Det)	Range 1	WQ.4330 Sh. 1 Ref. 6
L5	Tuning Coil (Det)	Range 2	WQ.4330 Sh. 1 Ref. 5
L6	Tuning Coil (Det)	Range 3	WQ.4330 Sh. 1 Ref. 4
L7	Tuning Coil (Osc)	Range 1	WQ.4330 Sh. 1 Ref. 3
L8	Tuning Coil (Osc)	Range 2	WQ.4330 Sh. 1 Ref. 2
L9	Tuning Coil (Osc)	Range 3	WQ.4330 Sh. 1 Ref. 1
L10	Tuning Coil (B.F.O.)		W.5990/A Refs. 9 & 10
L11	Inter Frequency 1st		WQ.3582 Ref. 7
L12	Inter Frequency 2nd		WQ.3582 Ref. 8
L13	Choke H.F.		W.5990/A Ref. 8
L14	Choke H.F.		Ditto
L15	Choke L.F.	30 Hy at 2 mA	WIS.204 Ed. H
TRANSFORMERS.			
T1	Intervalve		WIS.2718 Ref. 1
T2	Output		WIS.2830 Sh. 1
SWITCHES.			
S1	Wafer (Ae Circuit)		WIS.1197 Sh. 218
S2	Wafer (Det. Circuit)		Ditto
S3	Wafer (Osc. Circuit)		Ditto
S4	Wafer C.W./Phone		WIS.1197 Sh. 219
VALVES AND VALVEHOLDERS.			
V1	H.F.		Type KTW.61
V2	Mixer		Type X.65
V3	I.F.		Type KTW.61
V4	2nd Det—B.F.O.		Type DH.63
V5	Output		Type 6.V.6
	Valve Holder for V1 to V5	8-pin International Octal	WIS.1894
JACKS.			
J1	Phones	Jack 5 point	IS.212
TERMINALS AND TERMINAL STRIPS.			
TS.1	Chassis Contact Strip	16 Pairs of Tags	W.7893/C Ed. A



WE/W.5737/C Sh.

DIAGRAM OF CONN ECTIONS. RECEIVER UNIT.

CONTROL UNIT.

Ref.	*Description.*	*Nominal Value.*	*Drawing No.*
CONDENSERS.			
C1	Microphone Supply	25 μF	WIS.2569 Ref. 1
C2	Microphone Supply	Ditto	Ditto
C3	A.F. Amp. No. 1 Cathode	250 μF	WIS.2981
JACKS.			
J1	Phones	Jack 5 Point	IS.212
LOUDSPEAKER.			
LS1	For Receiver		WIS.2745
PILOT LAMPS.			
PL1	Transmitter Fils.	12 to 16 v. 0.2 amps. M.E.S.	WIS.3181/C Sh. 1 Ref.6
PL2	Receiver Fils.	Ditto	Ditto
	Holder for PL.1		WIS.3282/C Sh. 1 Ref. 2
	Holder for PL.2		Ditto
PLUG SOCKETS.			
PS1	Inter-Conn. Socket (Red)	7-pin	WSK.836 Ed. J
PS2	Inter-Conn. Socket (Blue)	7-pin	WSK.836 Ed. K
PS3	Hailer Socket (Green)	7-pin	WSK.836 Ed. M
PS4	Key and Mic.	10-pin	WIS.794
RESISTANCES.			
R1	L/S Vol. Control	2 ohms ± 10% 6 watt	WIS.2606 Ref. 1
R2	L/S Vol. Control	Ditto	
R3	Phones Loading	4 ohms ± 10% 6 watt	WIS.2606 Ref. 1
R4	L/S Vol. Control	Ditto	Ditto
R5	L/S Vol. Control	Ditto	Ditto
R6	A/F Amp. No. 2 Bias	150 ohms ± 10% 2 watt	WIS.2630 Ref. 2
R7	Hailer Vol. Control	Potentiometer 200 ohms ± 7.1/2% 4 watt	WIS.2262 Ref. 3
R8	Trans. Fil. Series	60 ohms ± 10% 12 watt	WIS.2606 Ref. 2
R9	Receiver Fil. Series	Ditto	Ditto
SWITCHES.			
S1	L.S. Vol. Control	3 Position 1 Wafer	WIS.1197 Sh. 194
S2	Send/Rec. Switch		IS.52/3
S3	Main Service Switch	10 Pole 4 Position	WIS.2452 Sh. 2
TRANSFORMERS.			
T1	Hailer L/S		WSK.12639 Ed. A

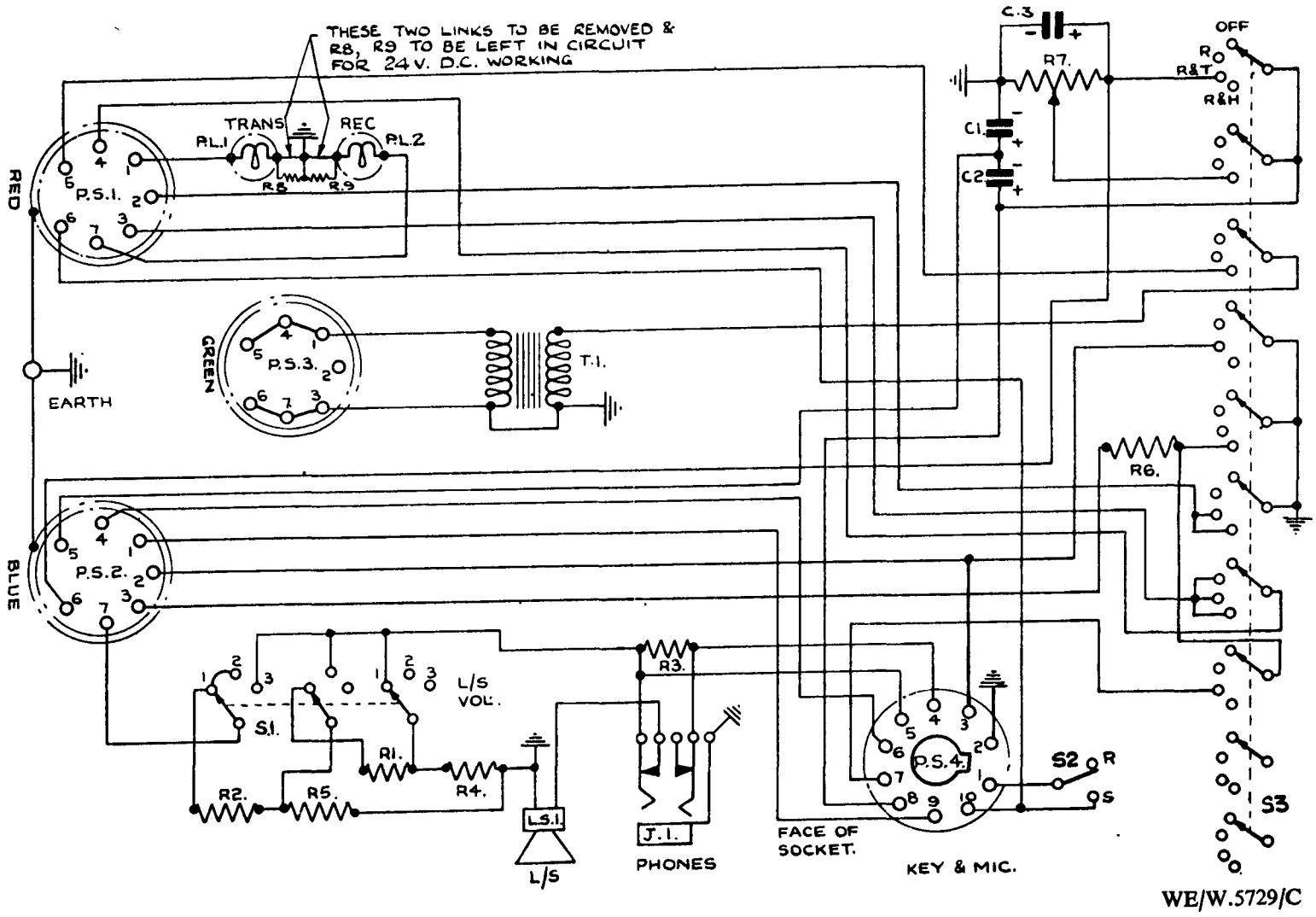


DIAGRAM OF CONNECTIONS. CONTROL UNIT.

MOUNTING TRAY.

escription.	*Nominal Value.*	*Drawing No.*
s.		
›ly Socket (Yellow)	7-pin	WSK.836 Ed. L
..r-Conn. Socket (Red)	7-pin	WSK.836 Ed. J
Inter-Conn. Socket (Blue)	7-pin	WSK.836 Ed. K
SWITCHES.		
S1 Power Supply	250 v. 15 Amp. D.P. on/off	WIS.2819
TMINALS AND TERMINAL STRIPS.		
Base Contact Strip (Power)	16 Pairs of Tags	WIS.2682
Base Contact Strip (Drive)	Ditto	Ditto
Base Contact Strip (Final ST)	Ditto	Ditto
Base Contact Strip (Rec.)	Ditto	Ditto

ACCESSORIES.

Description.		*Drawing No.*
RSE KEY.	Complete Assembly.	WSK.13472 Ed. A
Key, complete with Fixing Plate		WIS.2884 Sh. 1 Ref. 1
Lead and Plug		WSK.4384 Ed. F Sh. 3
Sleeve		WIS.2627 Ref. 4 Sh. 1
MICROPHONE HANDSET.	Complete Assembly.	WSK.14023 Ed. A
Microphone		WIS.2963 Ref. 1
Plug		WIS.171
HEADPHONES.	Complete Assembly.	WSK.12489 Ed. A
Telephone, 60 ohms per earpiece		WIS.2297
Telephone Lead		WSK.12488
Plug, 2 point		WIS.121
HAILER LOUDSPEAKER.	Complete Assembly.	WSK.12593 Ed. A
Hailer with Lead		WIS.2757
Plug (7 pin) with Green Ring		WSK.835 Ed. AH Sh. 4
R (1.5-9 mc/s)	Complete Assembly.	W.6103 Ed. A
Condenser		WSK.14374 Sh. 1
Neon Lamp		WIS.2729
Cursor		7/W.6103/C
Coil		W.6369 Ed. A
Coil Cover		WSK.14369 Ed. A
Coil Holder		WIS.2059
L PLUG.	Complete Assembly.	WSK.12481 Sh. 1 Ed. A
NECTING CABLES.		
7 Core Red	Length to suit Installation	W.5835
7 Core Blue	Ditto	W.5835
2 Core Mains		W.5835 Ed. C

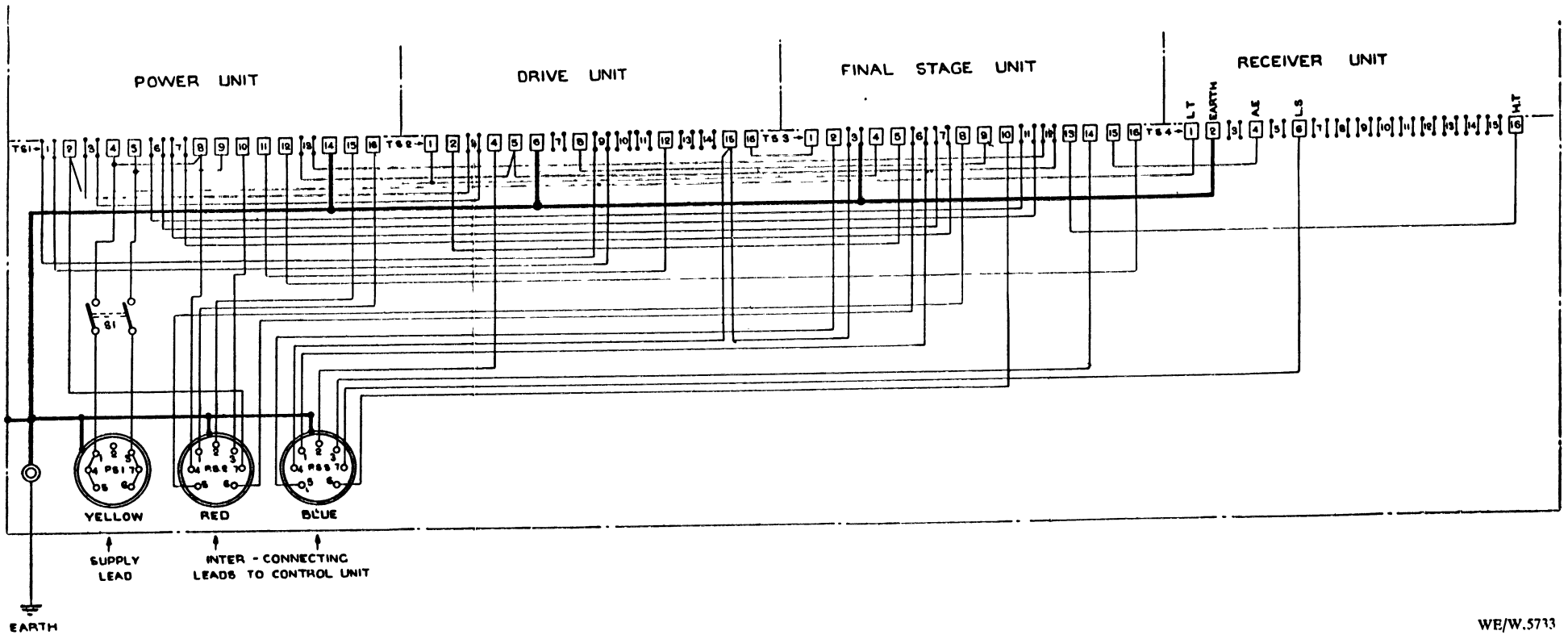
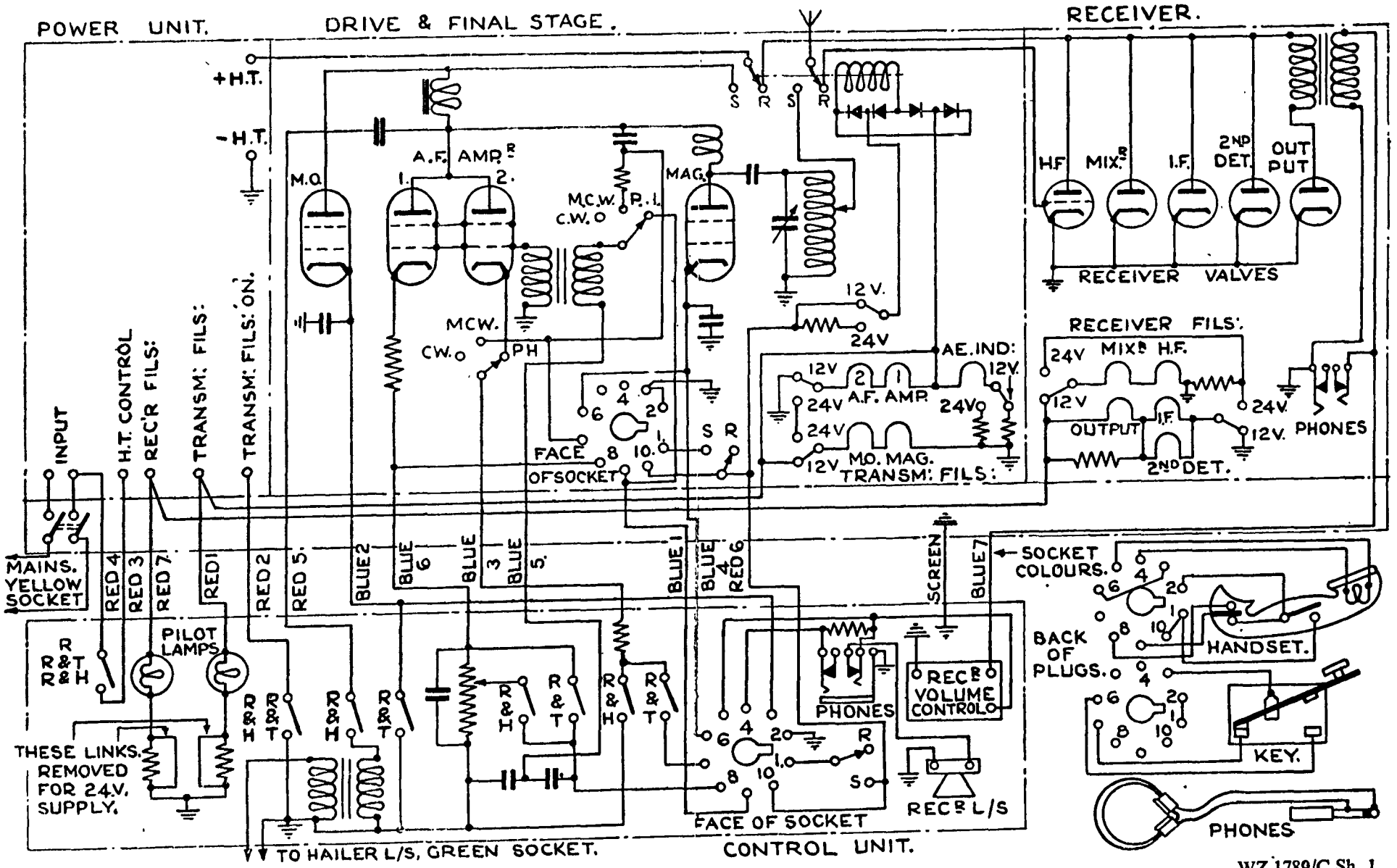
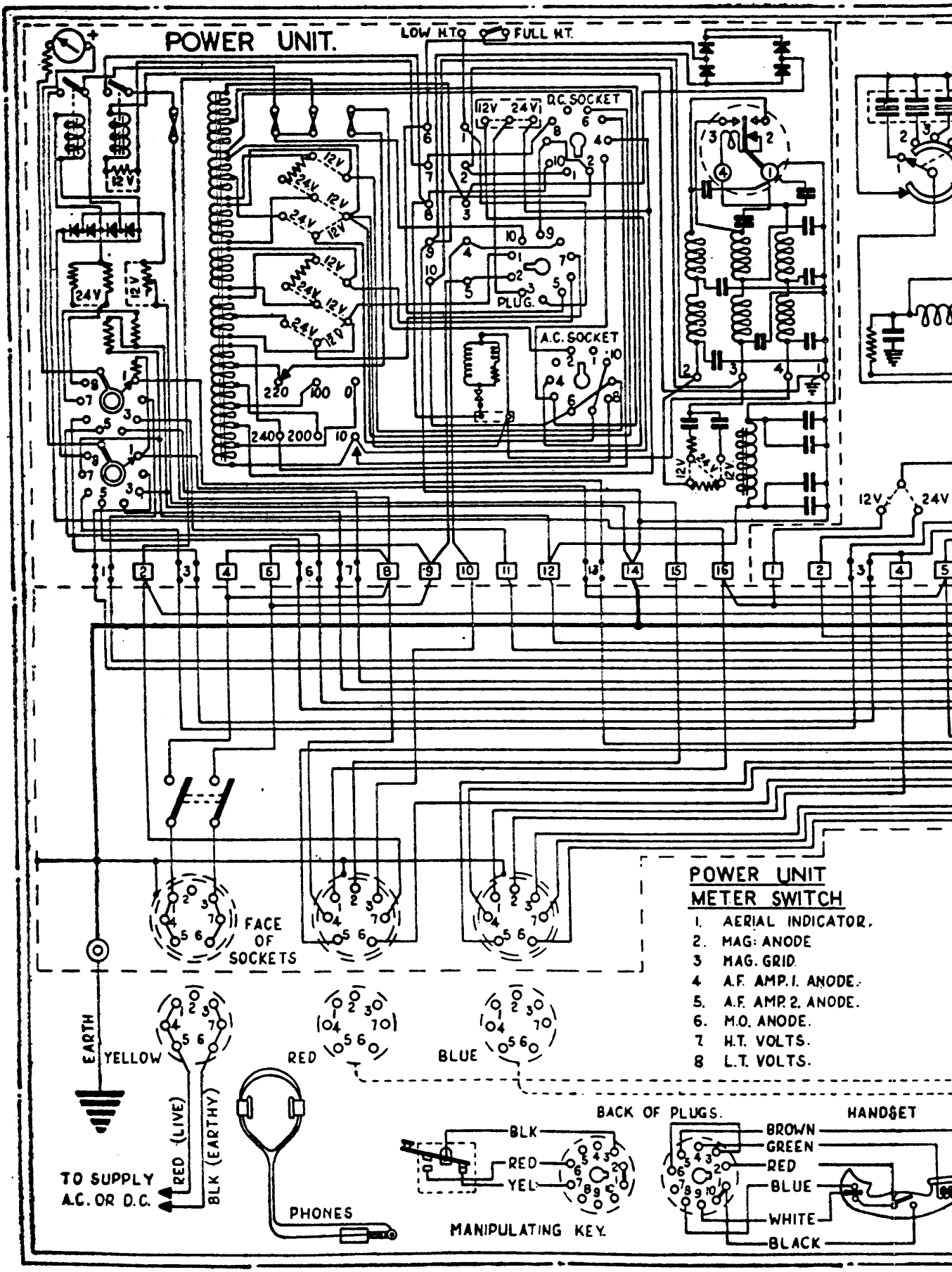


DIAGRAM OF CONNECTIONS. MOUNTING TRAY.



WZ.1789/C Sh. 1

DIAGRAM OF CONTROL CIRCUITS OF THE EQUIPMENT.


POWER UNIT.
LOW H.T.
FULL H.T.
D.C. SOCKET
A.C. SOCKET
PLUG.
12V
24V
220
100
0
240
200
10
FACE OF SOCKETS
EARTH
YELLOW
RED
BLUE
RED (LIVE)
BLK (EARTHY)
TO SUPPLY A.C. OR D.C.
PHONES
BACK OF PLUGS.
BLK
RED
YEL
MANIPULATING KEY.
HANDSET
BROWN
GREEN
RED
BLUE
WHITE
BLACK
POWER UNIT
METER SWITCH
1. AERIAL INDICATOR.
2. MAG: ANODE
3 MAG. GRID
4 A.F. AMP. 1. ANODE.
5. A.F. AMP. 2. ANODE.
6. M.O. ANODE.
7 H.T. VOLTS.
8 L.T. VOLTS.

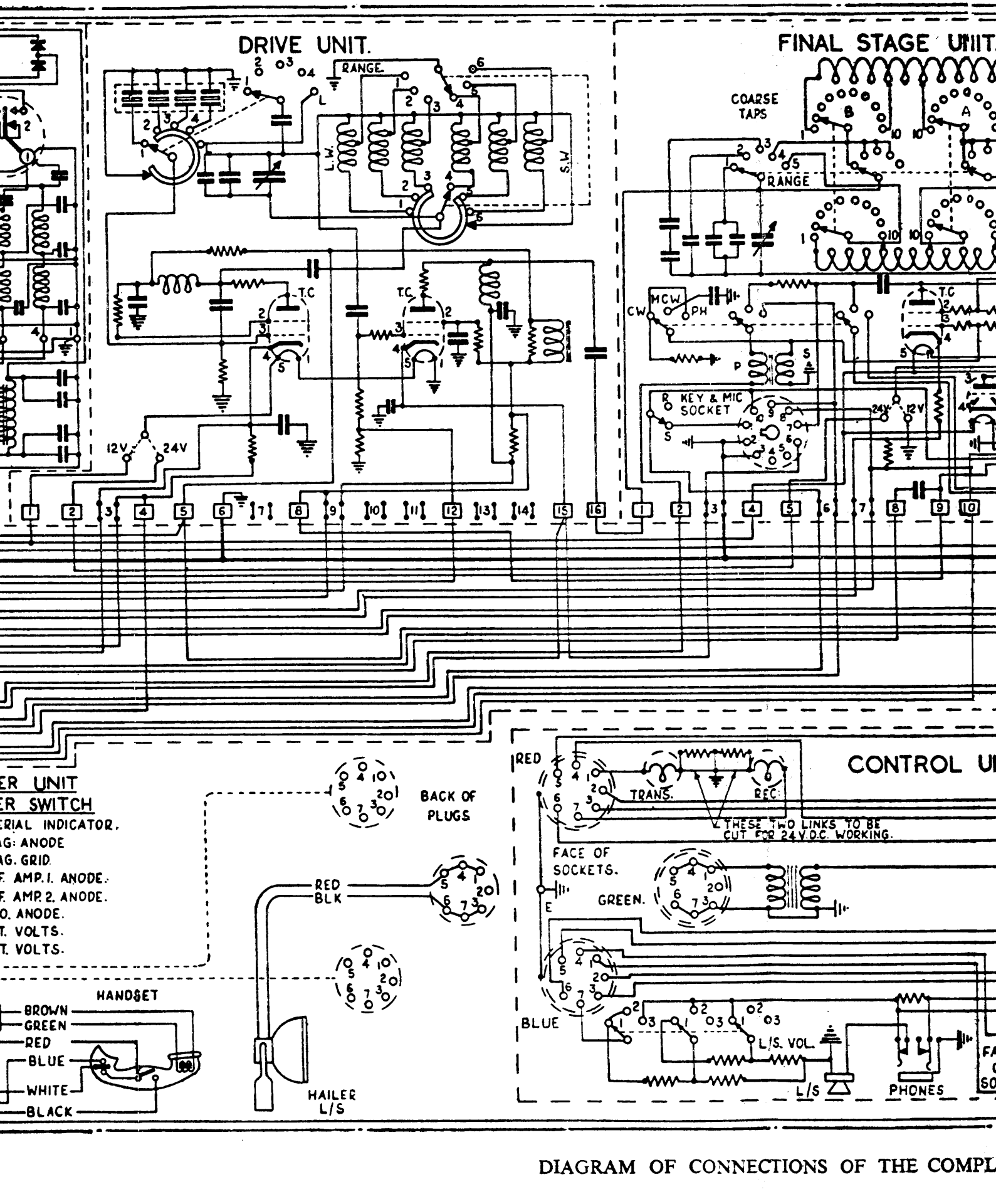
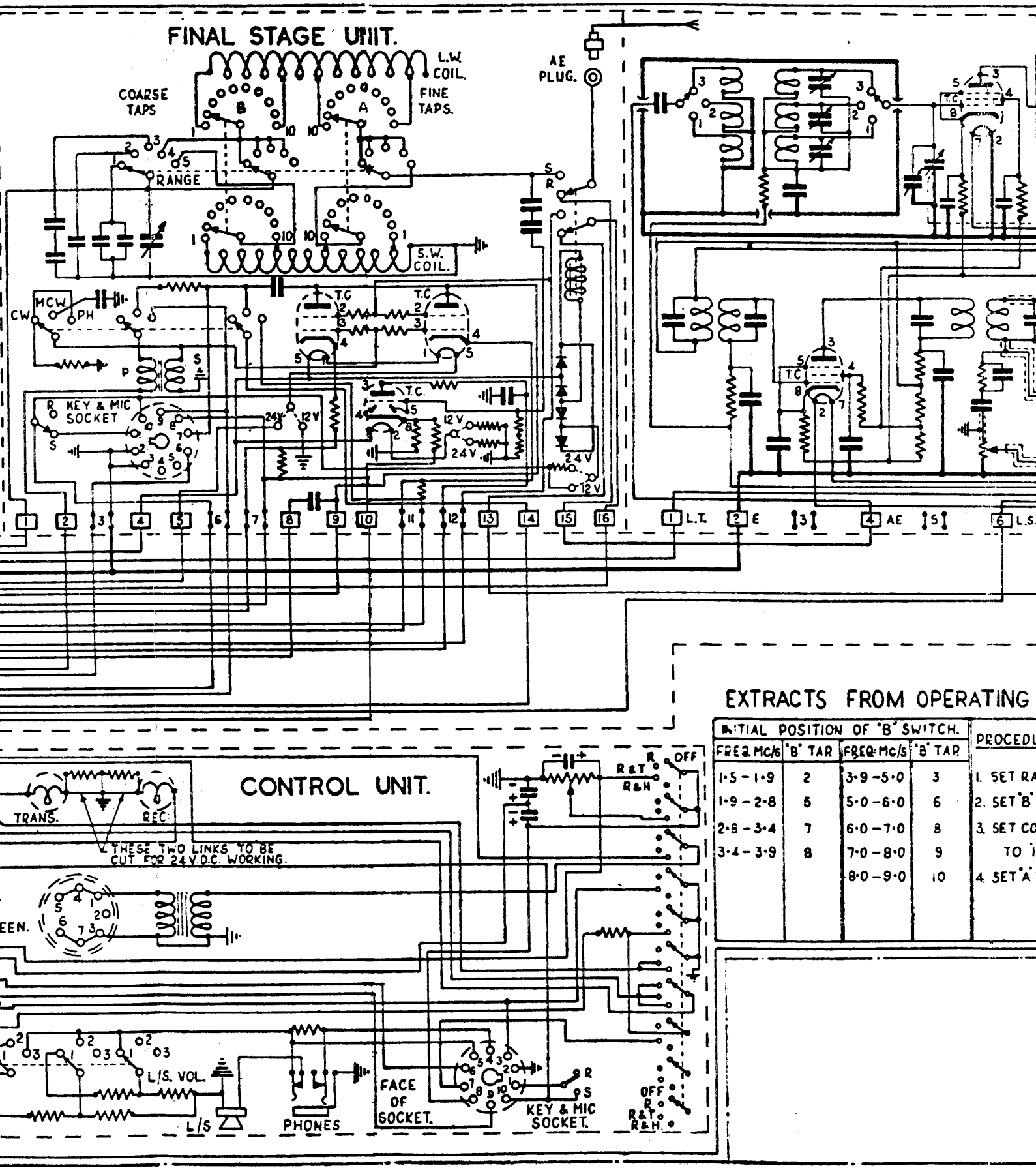


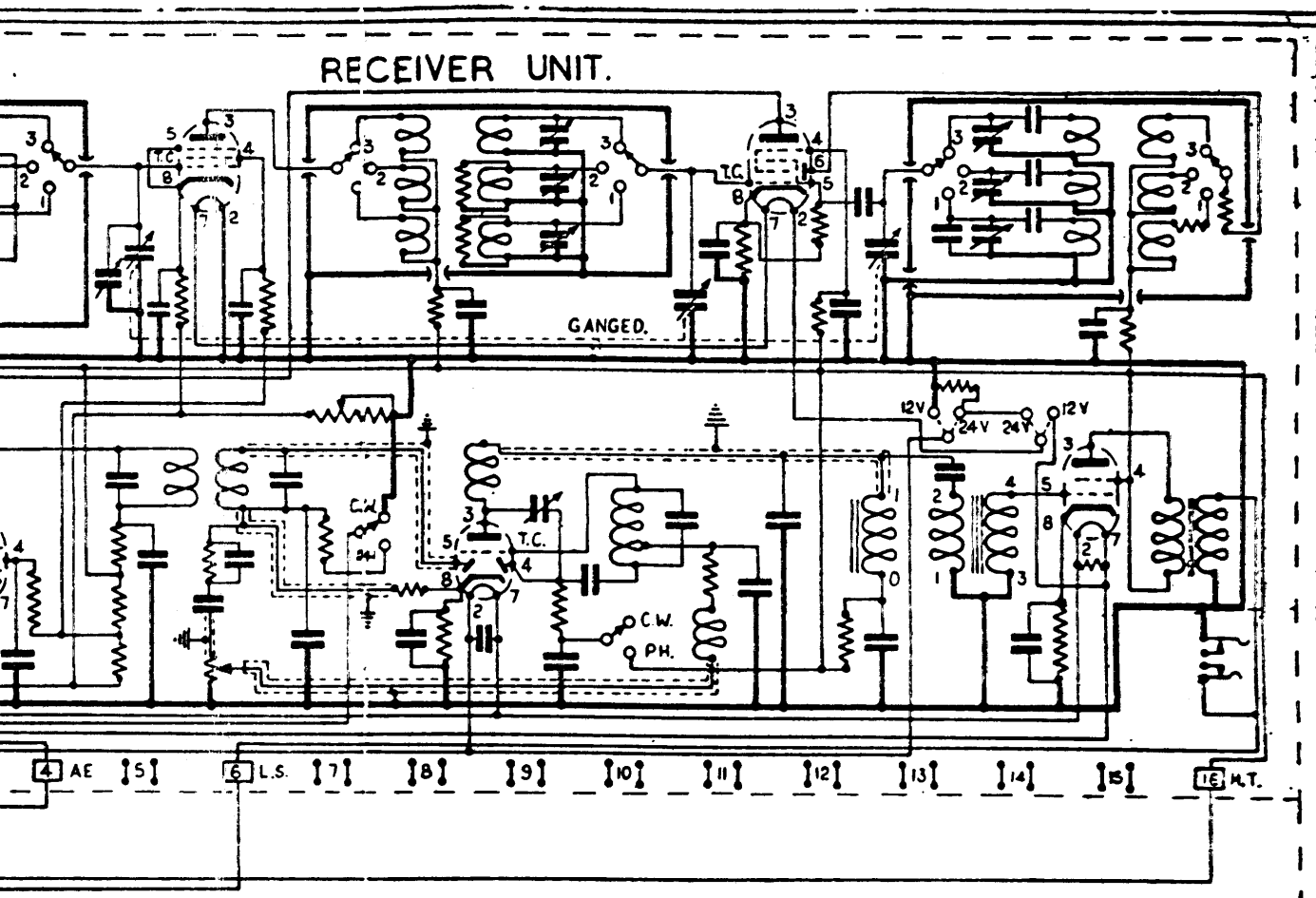
DIAGRAM OF CONNECTIONS OF THE COMPL



EXTRACTS FROM OPERATING

INITIAL POSITION OF "B" SWITCH.				PROCEDU
FREQ. Mc/s	"B" TAR	FREQ. Mc/s	"B" TAR	
1·5 – 1·9	2	3·9 – 5·0	3	1. SET RA
1·9 – 2·8	5	5·0 – 6·0	6	2. SET "B"
2·8 – 3·4	7	6·0 – 7·0	8	3. SET CO
3·4 – 3·9	8	7·0 – 8·0	9	TO
		8·0 – 9·0	10	4. SET "A

M OF CONNECTIONS OF THE COMPLETE EQUIPMENT.



FROM OPERATING INSTRUCTIONS FOR C.N.Y.2. RELATING TO TUNING OF AERIAL CIRCUIT.

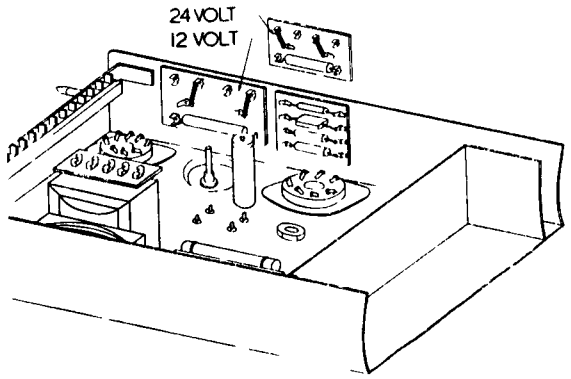
N OF "B" SWITCH.		PROCEDURE.
FREQ: Mc/s	"B" TAP	
3·9 – 5·0	3	1. SET RANGE
5·0 – 6·0	6	2. SET "B" TAP
6·0 – 7·0	8	3. SET CONDR TO "100"
7·0 – 8·0	9	
8·0 – 9·0	10	4. SET "A" TO "1"

1·5 TO 3·9 MC/S

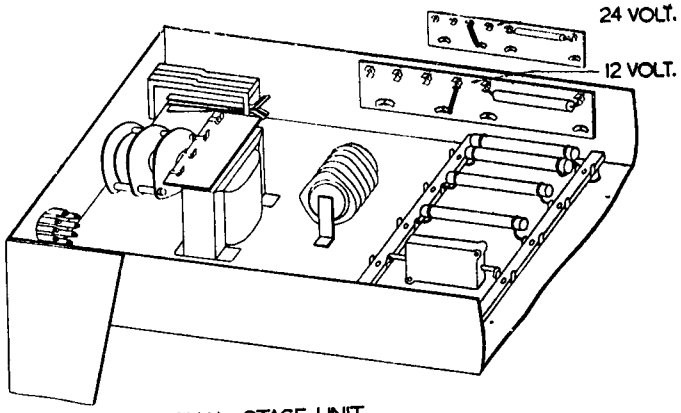
5. ROTATE "A" FOR DIP ON "MAG: ANODE" IF NO DIP INCREASE "B" & REPEAT
6. ADJUST CONDENSER FOR MINIMUM ON METER
   IF THIS COMES BEYOND "0" ON CONDR DECREASE "A", OR IF BEYOND "100" INCREASE "A", UNTIL MINIMUM CAN BE TUNED
7. LOAD UP TO 1·25 ON METER THUS:-
   (i) TO INCR: TO 1·25 — INCR: "A" TAP BY TAP, KEEPING CONDR IN TUNE, UNTIL
   a) METER DIP READS 1·25 — TUNING COMPLETE.
   OR b) A FURTHER CHANGE IN "A" WOULD BRING DIP BEYOND CONDR SCALE — TUNING COMPLETE
   OR c) "A" REACHES "10" THEN INCR: "B" ONE TAP, TURN "A" TO "1" OR "2" & RE-TUNE CONDR CONTINUE TO INCR: "A" UNTIL (a) OR (b) OCCURS
   (ii) TO DECR: TO 1·25 — DECR "A" TAP BY TAP, KEEPING CONDR IN TUNE, UNTIL (a) OR (b) OCCURS.
   OR d) "A" REACHES "1" THEN DECR: "B" ONE TAP, TURN "A" TO 9 OR 10 & RE-TUNE CONDR. CONTINUE TO DECR: "A" UNTIL (a) OR (b) OCCURS.

3·9 TO 9·0 MC/S

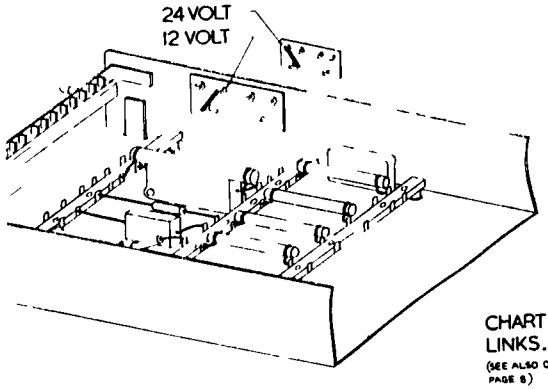
5. ADJUST CONDR FOR MINIMUM ON "MAG: ANODE"
6. LOAD UP TO 1·25 ON METER THUS:-
   INCR: "A" TAP BY TAP, KEEPING CONDR IN TUNE, UNTIL
   (a) METER DIP READS 1·25 — TUNING COMPLETE
   OR (b) A FURTHER INCR: IN "A" WOULD BRING DIP BEYOND "0" OR "100" ON CONDR SCALE. THEN DECR: OR INCR: "B" ACCORDINGLY BY ONE TAP & CONTINUE TO INCR: "A"
   OR (c) "A" REACHES "10" THEN INCR: "B" TAP BY TAP, KEEPING CONDR IN TUNE, UNTIL
   (d) METER DIP READS 1·25 — TUNING COMPLETE
   OR (e) A FURTHER INCR: IN "B" WOULD BRING DIP BEYOND CONDR SCALE.—TUNING COMPLETE



RECEIVER UNIT

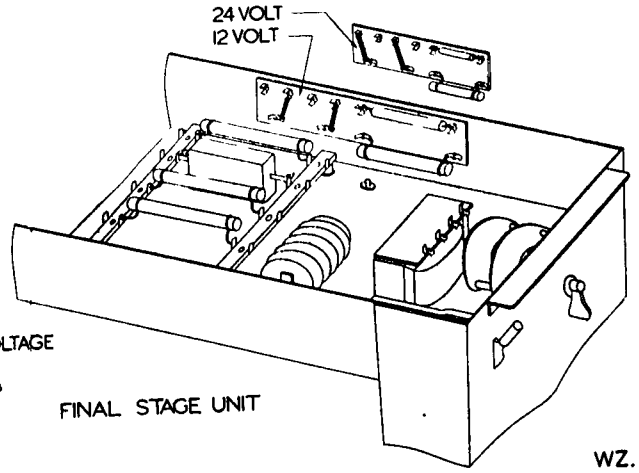


FINAL STAGE UNIT



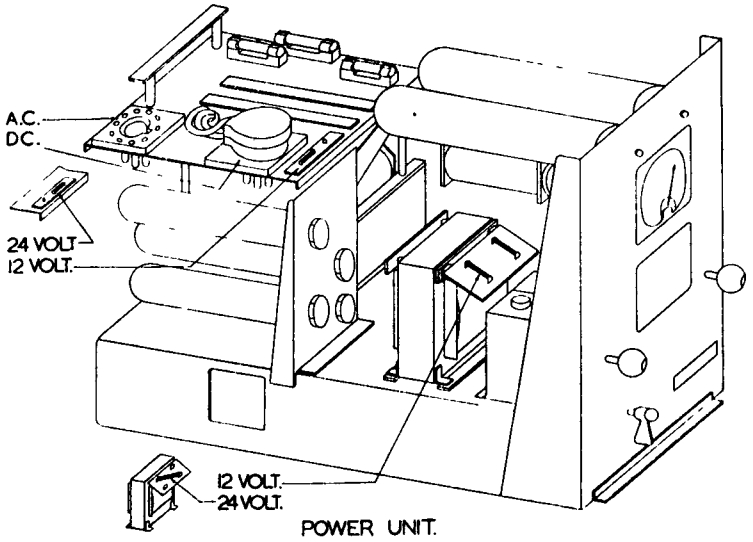
DRIVE UNIT

C NY 2
CHART OF SUPPLY VOLTAGE LINKS.
(SEE ALSO OPERATING INSTRUCTIONS PAGE 8)

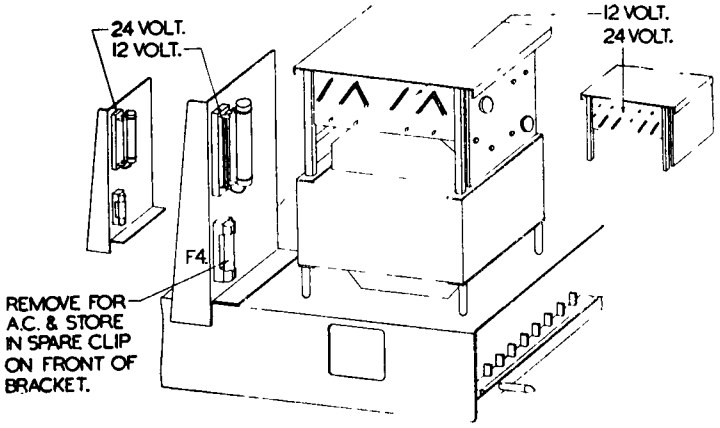


FINAL STAGE UNIT

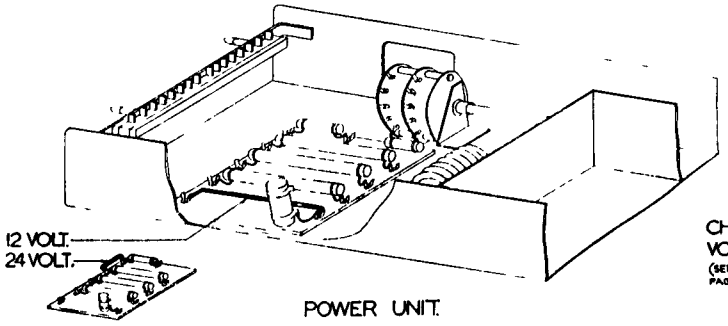
WZ. 1989.



POWER UNIT.

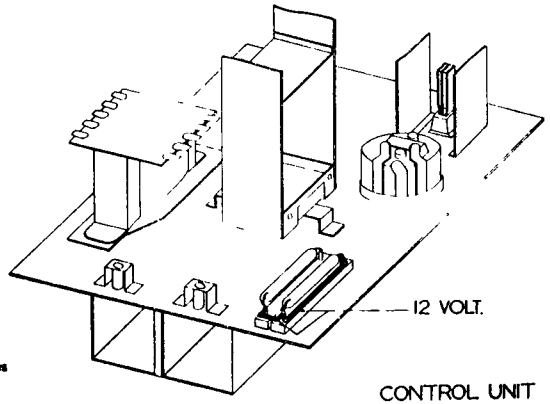


POWER UNIT.



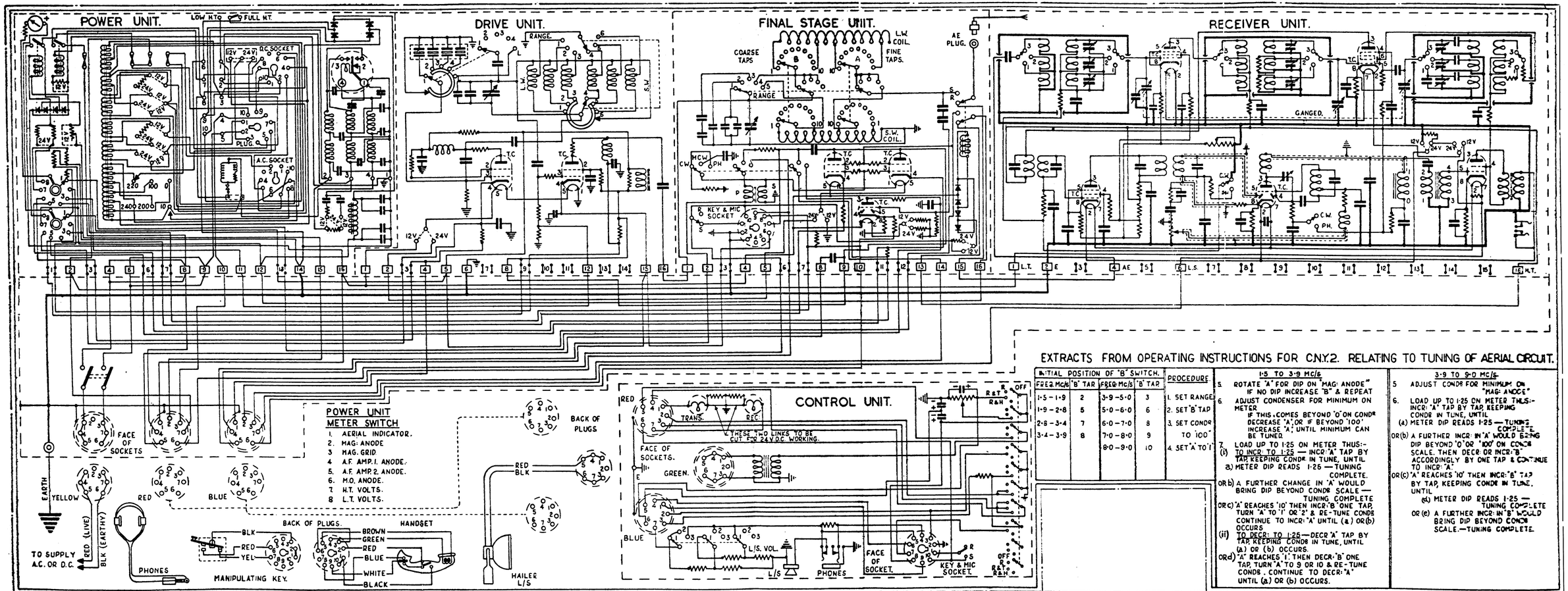
POWER UNIT.

C.N.Y. 2.
CHART OF SUPPLY VOLTAGE LINKS.
(SEE ALSO OPERATING INSTRUCTIONS PAGE 8.)



CONTROL UNIT

WZ.1989.



EXTRACTS FROM OPERATING INSTRUCTIONS FOR C.N.Y.2. RELATING TO TUNING OF AERIAL CIRCUIT.

INITIAL POSITION OF 'B' SWITCH.

FREQ. Mc/s	'B' TAP	FREQ. Mc/s	'B' TAP
1·5 - 1·9	2	3·9 - 5·0	3
1·9 - 2·8	5	5·0 - 6·0	6
2·8 - 3·4	7	6·0 - 7·0	8
3·4 - 3·9	8	7·0 - 8·0	9
		8·0 - 9·0	10

PROCEDURE

1. SET RANGE
2. SET 'B' TAP
3. SET CONDR TO 100'
4. SET 'A' TO '1'

1·5 TO 3·9 Mc/s.

5. ROTATE 'A' FOR DIP ON "MAG: ANODE" IF NO DIP INCREASE 'B' & REPEAT
6. ADJUST CONDENSER FOR MINIMUM ON METER
   IF THIS COMES BEYOND '0' ON CONDR DECREASE 'A' OR IF BEYOND '100' INCREASE 'A' UNTIL MINIMUM CAN BE TUNED
7. LOAD UP TO 1·25 ON METER THUS:-
   (i) TO INCR: TO 1·25 — INCR: 'A' TAP BY TAP, KEEPING CONDR IN TUNE, UNTIL
   a) METER DIP READS 1·25 — TUNING COMPLETE.
   OR b) A FURTHER CHANGE IN 'A' WOULD BRING DIP BEYOND CONDR SCALE — TUNING COMPLETE
   OR c) 'A' REACHES '10' THEN INCR: 'B' ONE TAP, TURN 'A' TO '1' OR '2' & RE-TUNE CONDR CONTINUE TO INCR: 'A' UNTIL (a.) OR (b) OCCURS
   (ii) TO DECR: TO 1·25 — DECR 'A' TAP BY TAP, KEEPING CONDR IN TUNE, UNTIL
   a) OR (b) OCCURS.
   OR d) 'A' REACHES '1' THEN DECR: 'B' ONE TAP, TURN 'A' TO 9 OR 10 & RE-TUNE CONDR. CONTINUE TO DECR: 'A' UNTIL (a) OR (b) OCCURS.

3·9 TO 9·0 Mc/s.

5. ADJUST CONDR FOR MINIMUM ON "MAG: ANODE"
6. LOAD UP TO 1·25 ON METER THUS:-
   INCR: 'A' TAP BY TAP, KEEPING CONDR IN TUNE, UNTIL
   (a) METER DIP READS 1·25 — TUNING COMPLETE.
   OR (b) A FURTHER INCR: IN 'A' WOULD BRING DIP BEYOND '0' OR '100' ON CONDR SCALE. THEN DECR: OR INCR: 'B' ACCORDINGLY BY ONE TAP & CONTINUE TO INCR: 'A'
   OR (c) 'A' REACHES '10' THEN INCR: 'B' TAP BY TAP, KEEPING CONDR IN TUNE, UNTIL
   (d) METER DIP READS 1·25 — TUNING COMPLETE
   OR (e) A FURTHER INCR: IN 'B' WOULD BRING DIP BEYOND CONDR SCALE.—TUNING COMPLETE.

DIAGRAM OF CONNECTIONS OF THE COMPLETE EQUIPMENT.

WZ 1751