[redacted]

Corrected to [illegible] for 30th November, 1950.

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AUSTRALIAN MILITARY FORCES

(Z/ZAA 3088)

USER HANDBOOK

RECEPTION SET (AUST) No 8C

1950

[illegible]

MILITARY BOARD

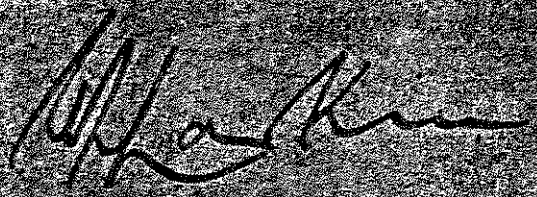
Army Headquarters,

Melbourne.

30th November 1950.

Issued by command of The Military Board.

Amendments will be published in Australian Army Orders.



Acting Secretary to the Board

Notified in A.A.O's for 30th November 1950.

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AUSTRALIAN MILITARY FORCES

(Z1/ZAA 3088)

USER HANDBOOK

for the

RECEPTION SET (AUST.) NO. 8C

1950

By Authority : - Photo-lithographed: Alexander Bros. Nepean Highway, Mentone, Vic.

Serial No.	AAO's	AMENDMENTS

Scope and Purpose

This User Handbook contains all necessary information for installing and operating a Reception Set (Aust.) No. 8C and includes such maintenance duties as come within the scope of the operator.

For detailed technical information and maintenance instructions reference should be made to the relevant Electrical and Mechanical Engineering Instructions (Aust.).

A complete list of components is contained in Schedule (Aust.) No. 611 for Wireless Station No. 153, of which Reception Set (Aust.) No. 8C is a part.

Installation and operating instructions for Wireless Set No. 153 are contained in the User Handbook for that equipment (Z1/ZAA 3304).

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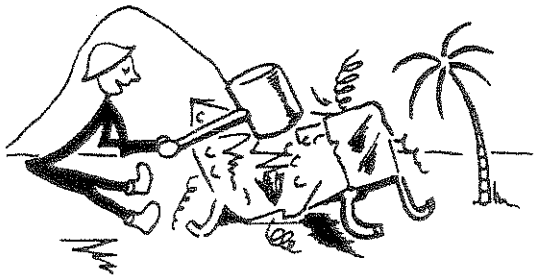
DENY IT TO THE ENEMY . . .



YOU CAN'T USE IT,

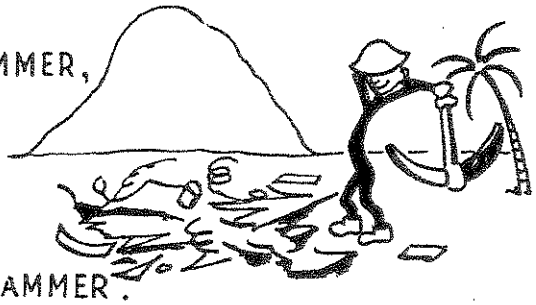
WHY SHOULD HE ?

HIT IT WITH A BRICK OR HAMMER,

CROWBAR,

PICK-AXE,

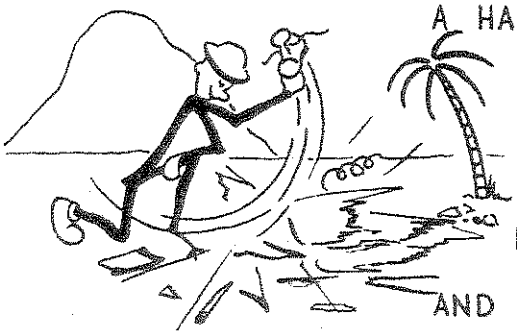
BOOT OR RAMMER.



A HAND GRENADE IS GOOD THEY SAY,

FOR SPEEDING THINGS ALONG

THEIR WAY.



IT REDUCES THEM TO LITTLE BITS,

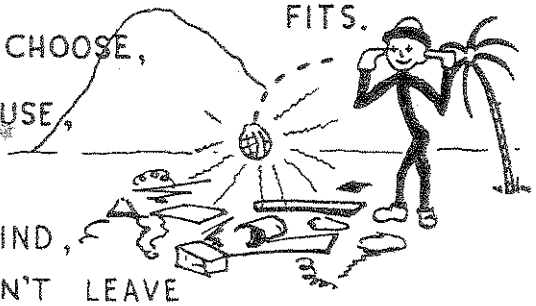
AND MAKES QUITE SURE THAT NOTHING

FITS.

WHATEVER METHOD YOU MAY CHOOSE,

TO MAKE YOUR SET UNFIT TO USE,

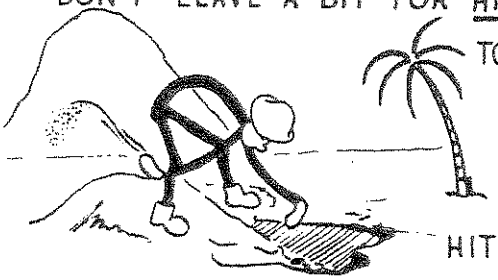
DON'T LEAVE A BIT FOR HIM



TO FIND,

DON'T LEAVE

THE SMALLEST THING BEHIND,

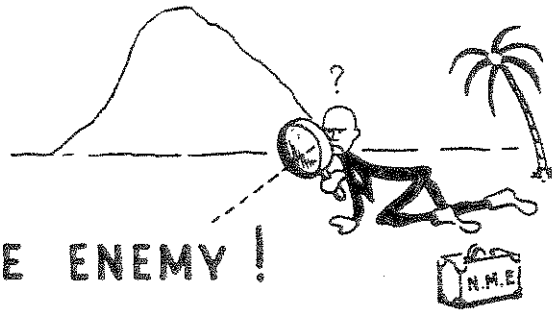


HIT IT, SMASH IT, BATTER IT,

BURY IT, DROWN IT, SCATTER IT.

THE MOTTO IS HERE

FOR ALL TO SEE



DENY IT TO THE ENEMY !

Destruction Notice

WHY ? To prevent the enemy from using or salvaging this equipment for his benefit.

WHEN ? When ordered by your commander.

HOW ? 1. SMASH - Use sledges, axes, pickaxes, hammers, crowbars, heavy tools.

2. BURN - Use petrol, kerosene, oil, flame-throwers, incendiary grenades.

3. EXPLOSIVES - Use firearms, grenades, TNT, guncotton.

Use anything immediately available to destroy the equipment. Do not be content with mere destruction: if time permits, bury the remains in slit trenches, fox-holes, drains; throw in streams or scatter.

DO ANYTHING IN YOUR POWER TO DENY THE USE OF EVEN THE SMALLEST ITEM TO THE ENEMY.

Safety Notice

Contact with supply mains or internal components of this equipment can cause INSTANT DEATH. The mains supply voltages of 220V AC or 110V AC are themselves potentially dangerous and it is best always to presume that all internal wiring carries a high voltage.

In no circumstances should external power supply connections be made to the equipment until all switches are personally proven to be in the "OFF" position.

When working with the WS 153 Sender it is well to remember that the internal wiring of the Sender carries approximately 2,000 Volts and that Radio-Frequency voltages up to 25,000 Volts can be developed at aerial terminals, so give the aerial terminals a wide berth when the equipment is working. Serious Radio-Frequency burns can be suffered from too close proximity to these terminals without necessarily touching them. So -

Keep Well Clear

Observe Safety Regulations at all times

●

First Aid for Electric Shock

Rescue. Shut off the high voltage at once and ground the circuits. If the high voltage cannot be turned off without delay, free the victim from contact with the live conductor as promptly as possible. Avoid direct contact with either the live conductor or the victim's body. Use a dry board, dry clothing or other non-conductor to free the victim.

Symptoms. Breathing stops abruptly in electric shock if the current passes through the breathing centre at the base of the brain. If the shock has not been too severe, the breathing centre recovers after a while and normal breathing is resumed, provided that a sufficient supply of air has been furnished meanwhile by artificial respiration.

The victim is usually very white or blue. The pulse is very weak or entirely absent and unconsciousness is complete. The victim's body may become rigid or stiff

in a very few minutes. This condition is due to the action of electricity and is not to be considered rigor mortis. Artificial respiration must still be given, as several such cases are reported to have recovered. The ordinary and general tests for death should never be accepted.

Treatment. (1) Start artificial respiration immediately. At the same time send for a medical officer, if assistance is available. Do not leave the victim unattended. Perform artificial respiration at the scene of the accident, unless the victim's or operator's life is endangered from such action. In this case only, remove the victim to another location, but no further than is necessary for safety. If the new location is more than a few feet away, artificial respiration should be given while the victim is being moved. If the method of transportation prohibits the use of the Shaeffer prone pressure method, other methods of resuscitation may be used. Pressure may be exerted on the front of the victim's diaphragm, or the direct mouth to mouth method may be used. Artificial respiration, once started must be continued without loss of rhythm.

(2) Lay the victim in a prone position, one arm extended directly overhead, and the other arm bent at the elbow so that the back of the hand supports the head. The face should be turned away from the bent elbow so that the nose and mouth are free for breathing.

(3) Open the victim's mouth and remove any foreign bodies, such as false teeth. The mouth should remain open, with the tongue extended. Do not permit the victim to draw his tongue back into his mouth or throat.

(4) If an assistant is available, he should loosen any tight clothing to permit free circulation of blood and to prevent restriction of breathing. He should see that the victim is kept warm, by applying blankets or other covering, or by applying hot rocks or bricks, wrapped in cloth or paper to prevent injury to the victim. The assistant should also be ever watchful to see that the victim does not swallow his tongue. He should continually wipe from the victim's mouth any frothy mucus or saliva that may collect and interfere with respiration.

(5) The resuscitating operator should straddle the victim's thighs, or one leg, in such a manner that the:-

(i) Operator's arms and thighs will be vertical while applying pressure on the small of the victim's back.

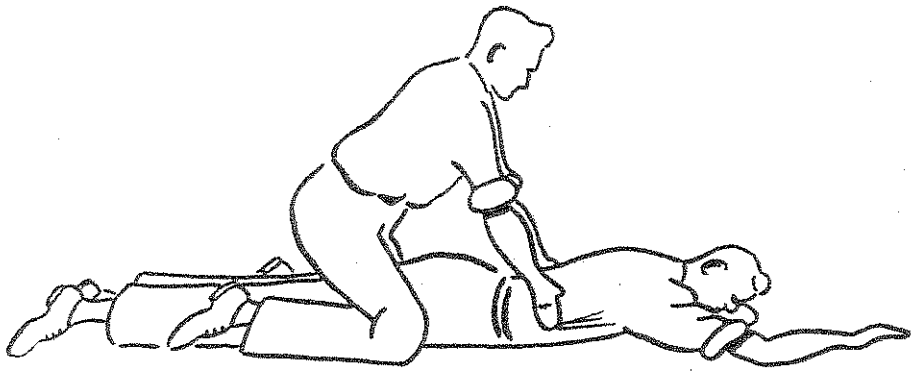
(ii) Operator's fingers are in a natural position on the victim's back with the little fingers just touching the lowest ribs.

(iii) Heels of the hands rest on either side of the spine as far apart as convenient without allowing the hands to slip off the victim.

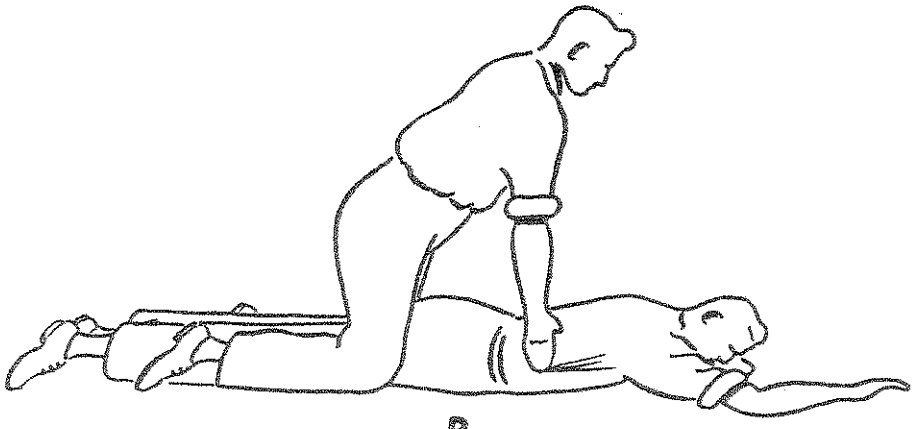
(iv) Operator's elbows are straight and locked.

(6) The resuscitation procedure is as follows:-

(i) Exert downward pressure for 1 second.



A



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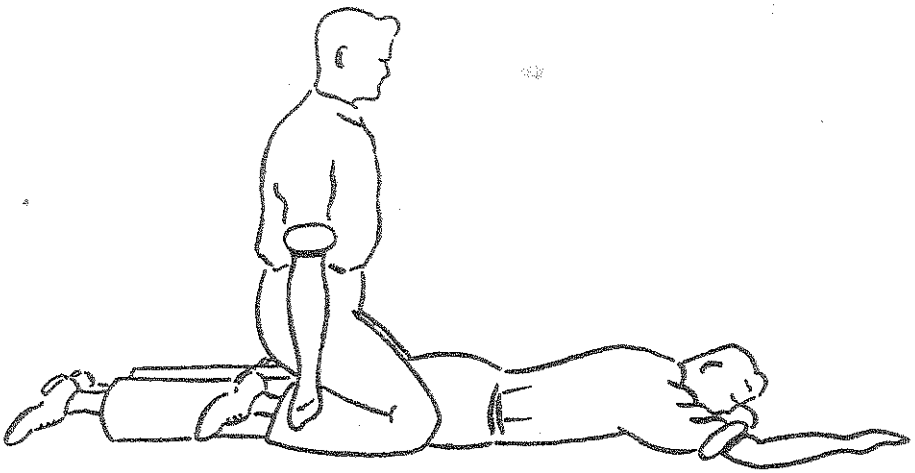


C

(ii) Swing back, suddenly releasing pressure and sit on the heels.

(iii) After 2 seconds' rest, swing forward again, positioning the hands, and apply pressure for another second.

(7) The forward swing, positioning of the hands, and the downwards pressure should be accomplished in one continuous motion, which requires 1 second. The release and backward swing require 1 second. The addition of the 2 second rest makes a total of 4 seconds for a complete cycle. Until the operator is thoroughly familiar with the correct cadence of the cycle, he should count the seconds aloud, speaking distinctly and counting evenly in thousands. Example: one thousand and one, one thousand and two, etc.

(8) Artificial respiration should be continued until the victim regains normal breathing, or is pronounced dead by a medical officer. Since it may be necessary to continue resuscitation for several hours, relief operators should be used if available.

Relieving Operator. The relief operator kneels beside the operator and follows him through several complete cycles. When the relief operator is sure that he has the correct rhythm, he places his hands on the operator's hands without applying pressure. This indicates to the operator that he is ready to take over. On the backward swing, the operator moves and the relief operator takes his position. The relieved operator follows through several complete cycles to be sure that the new operator has the correct rhythm. He remains alert to take over instantly if the new operator falters or hesitates on the cycle.

Stimulants. (1) If an inhalant stimulant is used, such as aromatic spirits of ammonia, the individual administering the stimulant should first test it himself to see how close he can hold the inhalant to his own nostrils for comfortable breathing. Be sure that the inhalant is not held any closer to the victim's nostrils, and then only for 1 or 2 seconds every minute.

(2) After the victim has regained consciousness, he may be given hot coffee, hot tea or a glass of water containing ½ teaspoon of aromatic spirits of ammonia. DO NOT GIVE ANY LIQUIDS TO AN UNCONSCIOUS VICTIM.

Precautions. (1) After the victim revives, keep him lying quietly. Any injury a person may have received may cause a condition of shock. Shock is present if the victim is pale and has a cold sweat, his pulse is weak and rapid, and his breathing is short and gasping.

(2) Keep the victim lying flat on his back, with his head lower than the rest of his body and his hips elevated. Be sure that there is no tight clothing

to restrict the free circulation of blood or hinder natural breathing. Keep him warm and quiet.

(3)- A resuscitated victim must be watched carefully as he may suddenly stop breathing. NEVER LEAVE A RESUSCITATED PERSON ALONE UNTIL IT IS CERTAIN THAT HE IS FULLY CONSCIOUS AND BREATHING NORMALLY.

Chapter I

General Description

Section 1

General Features

1.1 Design Features.

The Reception Set (Aust.) No. 8C has been designed specifically for operation with the Wireless Set No. 153, complete station. It is built to withstand adverse conditions of humidity, high temperature and mechanical vibration.

Two Reception Sets (Aust.) No. 8C are supplied with each complete Wireless Station No. 153. The two sets are identical except for a small difference which will be described later. The difference is due to the different roles of the two receivers, one being situated beside the transmitter, and the other being at a remote controlling point.

The set is a 9 valve, high gain, superheterodyne equipment with a frequency range of 1.85 - 26 Mc/s.

Muting is provided in the set so that, when it is in close proximity to the sender, it becomes insensitive when the latter is keyed. Thus, dangerous RF voltages are prevented from damaging components of the receiver.

1.2 Facilities.

The reception set may be operated as a separate receiving set from a 12-volt secondary battery or from 220 Volts or 110 Volts AC.

It can be used in conjunction with Wireless Set No. 153 for operation as a fixed station or mounted in Trucks, 4 x 4, ¼-ton.

The equipment is designed for the reception of CW, MCW and RT emissions.

Signals may be received on receivers, headgear or on the monitor loud speaker. The output may be connected to line by means of a 600 ohm line jack.

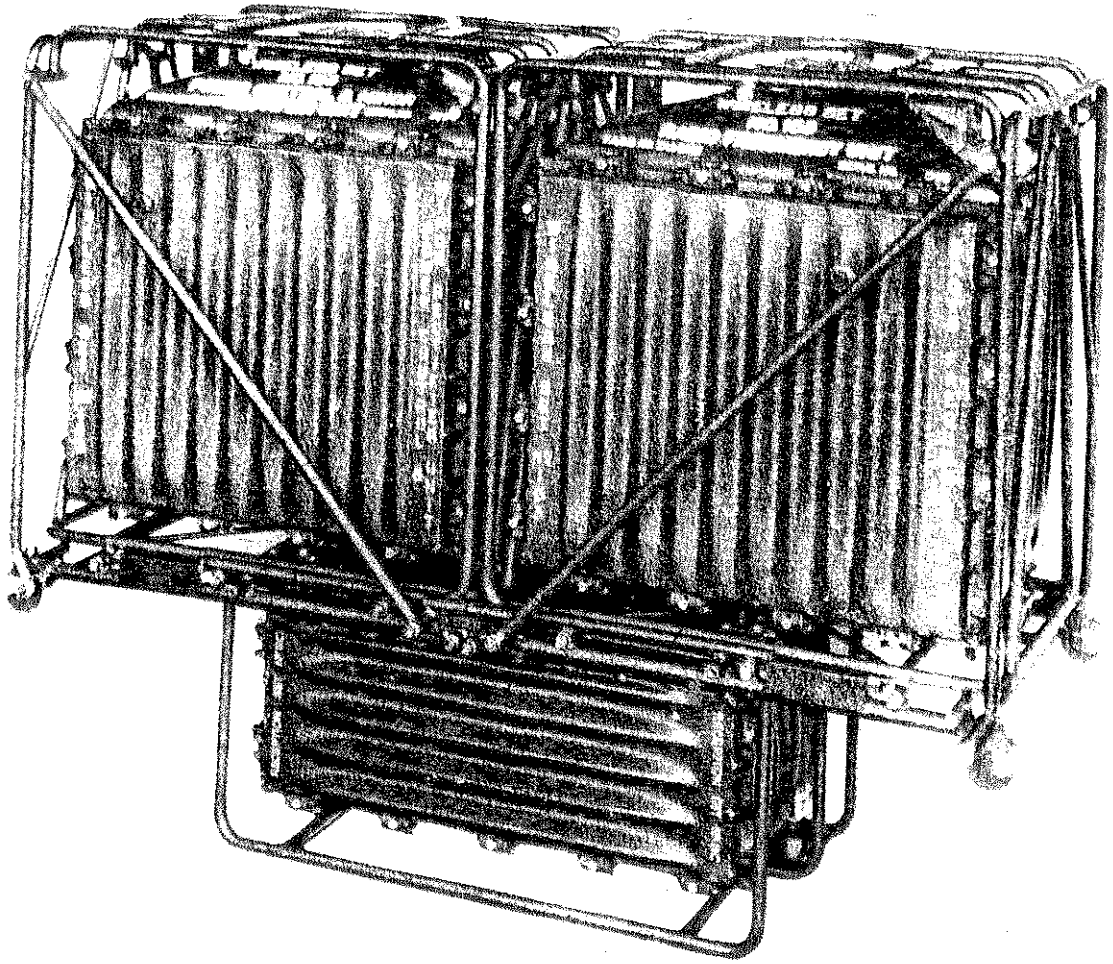
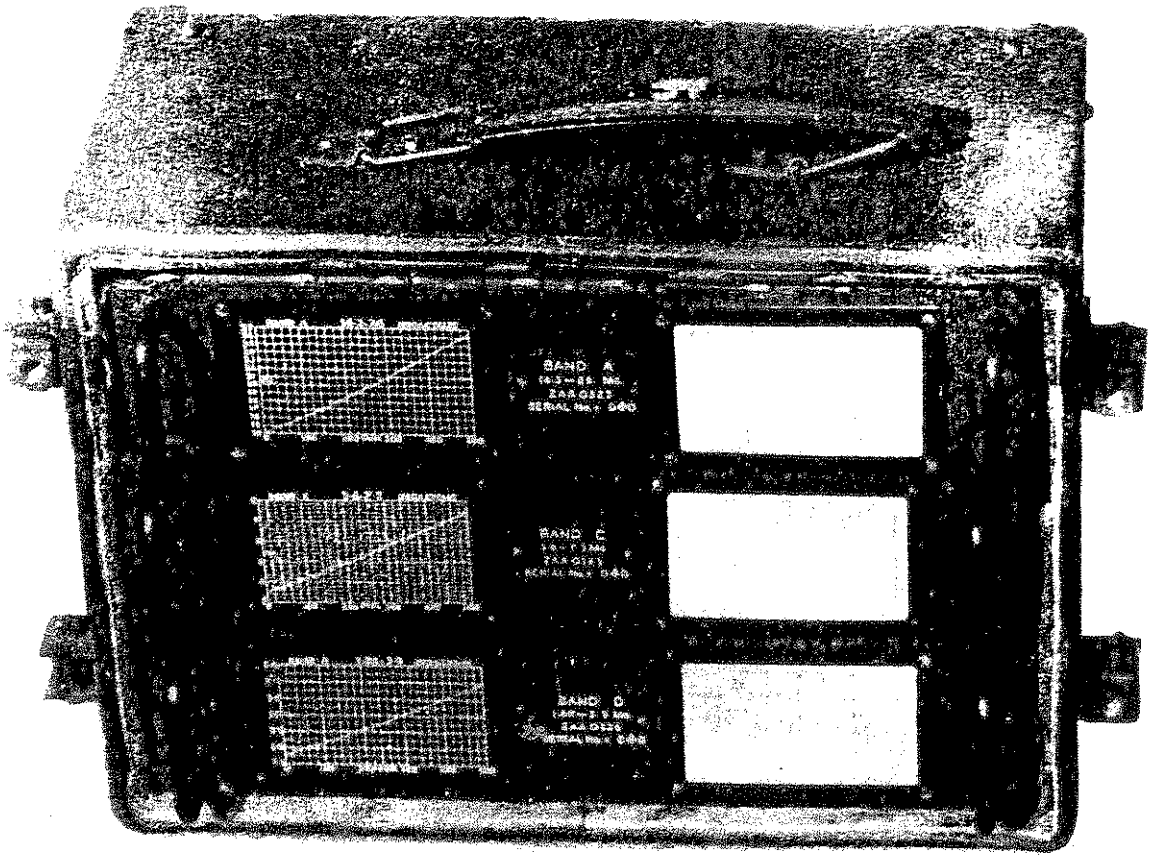


FIG. 1

RECEPTION SET (AUST) NO. 8C ASSEMBLED WITH MAIN UNITS OF WS 153 SENDER FOR FIXED STATION OR VEHICLE INSTALLATION (COMPONENTS CLOSED).



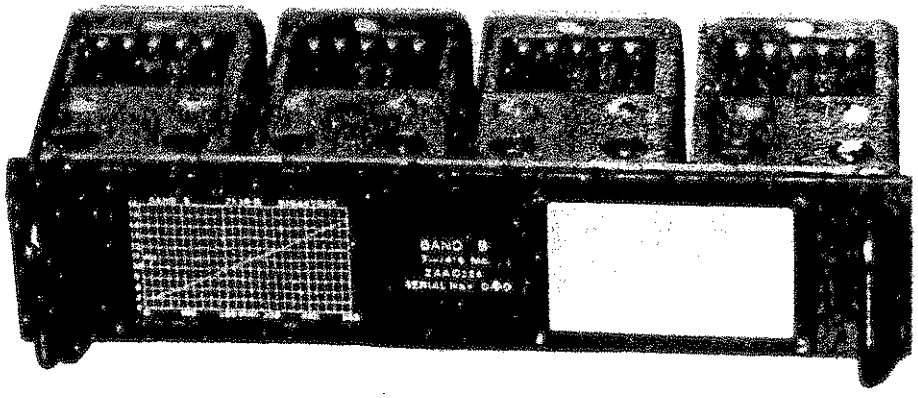


FIG. 2
COIL UNITS AND CASE

1.3 Frequency Range.

The Frequency Range is continuous from 1.85 Mc/s to 26 Mc/s in 4 bands. "Plug-in" coil units are employed as follows:-

Band A - 14.3 Mc/s to 26 Mc/s.

Band B - 7.0 Mc/s to 14.6 Mc/s.

Band C - 3.6 Mc/s to 7.3 Mc/s.

Band D - 1.85 Mc/s to 3.9 Mc/s.

The intermediate frequency is 455 Kc/s.

A crystal filter unit is incorporated in the IF Amplifier to allow narrow band reception of CW. The selectivity may be varied by means of a Selectivity Control. This control has a sufficient range for speech reception. A phasing control in the filter circuit assists in the elimination of heterodyne interference.

1.4 Power Supply.

The receiver can be operated from any of the following power supplies:-

(1) 200, 220 or 240 Volts, 50 to 60 cycles.

(2) 100, 110 or 120 Volts, 50 to 60 cycles.

(3) 12 Volt secondary battery (A non-synchronous vibrator is employed).

The "ON-OFF" switch and "INPUT VOLTAGE SELECTOR" switch are mechanically interlocked, so that the receiver cannot be changed over to one of the alternative power supplies, unless it is first switched off.

1.5 Current Consumption.

The input required from the AC supply is approximately 70 watts. When a 12 volt secondary battery is used, the drain is approximately 5.5 amps.

Included in the AC and DC supply circuits are 3 amp and 10 amp fuzes respectively.

1.6 Output Circuits and Muting.

Two output jacks provide connections for:-

(1) Receivers, Headgear, CLR, double Mk. 3 (Aust.).

(2) A 600 ohm line.

There is also a third jack through which the reception set may be muted by means of the relay contained in Wireless Remote Control Unit H (Aust.) No. 1 or No. 2, hereinafter referred to as RCU1 or RCU2, associated with Wireless Set No. 153. When the plug is withdrawn the contacts of this jack close and thus the muting facility is removed. The receiver may then be operated independently of the remote control.

1.7 Monitoring.

A monitor speaker is incorporated in the reception set. Facilities are provided for switching off this speaker when it is not required.

1.8 Mechanical Construction.

The reception set and power unit are constructed on a common chassis with an attached front panel.

The equipment is sealed in a one-piece, ribbed aluminium alloy case, the front panel being screwed against a soft rubber gasket. A detachable immersion-proof cover (also of ribbed aluminium alloy construction) is secured to the front of the set case by means of a number of clamps and a rubber gasket. A canvas flap, carried inside the cover, may be clipped to the front of the case when the immersion-proof cover is removed. With the cover in place the case is immersion proof and also protects the equipment in transit. With the cover removed and the canvas flap fitted, the unit is shower-proof and splash-proof.

Each control knob on the panel is fitted with a gland which renders the shaft bushing splash-proof. The monitor loud speaker is mounted behind a grille in the front panel. A sheet of polyvinyl chloride fitted between the grille and loud-speaker, protects the cone against damage by moisture, dust, etc.

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

1.9 Mountings.

The whole unit is shock-mounted in a tubular framework which is designed to mount the framework of the main units of the sender of Wireless Set No. 153.

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

1.10 Weights and Dimensions.

(1) Reception Set (Aust.) No. 8C without carrying frame.

Weight	-	74¾ lbs
Height	-	10½ inches
Length	-	28 inches
Depth	-	13½ inches

(2) Reception Set (Aust.) No. 8C with carrying frame.

Weight	-	93½ lbs
Height	-	15 inches
Length	-	31¼ inches
Depth	-	18½ inches

Section 2

Description of Controls etc.

(See Plate 1)

2.1 Aerial and Earth Connections.

Terminals for connection to the aerial are situated on the top left hand corner of the front panel of the set. The terminals marked "Aerial" and "Earth" are for connection to any standard type of aerial system.

A special socket is provided for connection to receiving aerials which are fitted with coaxial feeders of from 50 to 100 ohms impedance.

The earth terminal on the bottom right hand corner is for connection to an earth spike when the reception set is used in conjunction with remote control equipment.

2.2 Power Supply Connections.

The reception set located at the sender of WS 153 receives 110 volts or 220 volts power supply from the "Power Control and Minor Rectifier Unit" via "Connector, 3 point (Aust.) No. A6", which is plugged into the appropriate sockets marked on the two units.

The reception set located at the remote position is connected to the 110 or 220 volts AC supply, (if available) by means of a "Connector, 3 point, (Aust.) No. A8". If AC supply is not available at this point, a 12 volt secondary battery supply is connected by means of "Connector, 2 point (Aust.) No. A9", which is plugged into the 3-pin triangular male socket marked "DC Input".

According to the power supply in use, the power selector switch must be turned to the appropriate position "220 Volts AC", "110 Volts AC" or 12 Volts DC".

2.3 Power Selector Switch.

The Power Selector Switch situated at the bottom right of the reception set front panel is switched to 220 volts AC, 110 volts AC or 12 volts DC in accordance with the type of power supply available.

This switch must not be altered when the power is "ON". A special safety device is incorporated to lock the Power Selector Switch when the "ON-OFF" Switch is "ON".

2.4 ON-OFF Switch.

This is the main power switch of the reception set. The Power Selector Switch is interlocked with this switch.

2.5 Facility Switch.

This is a 4 position switch located at the bottom right of the set front panel.

Position (1) - "HT OFF". The HT supply is disconnected, but the valve heaters remain on. This position is used when "standing by" or changing coils.

Position (2) - "AVC ON". The HT is "ON" and the Automatic Volume Control line is connected so that the reception set operates normally, the output being automatically regulated by the strength of the received carrier. This position may be used for the reception of speech or MCW where the tone only is keyed.

Position (3) - "AVC OFF". The HT is connected but the Automatic Volume Control is disconnected. This position is used for MCW where both the carrier and tone are keyed simultaneously.

Position (4) - "BFO ON". This switches the Beat Frequency Oscillator on and leaves the AVC circuit disconnected. This position is used for the reception of CW signals. It may also be used to locate a weak RT carrier. Once located, the weak RT signal can be finally tuned by setting the Facility Switch to position (2).

2.6 The Speaker ON-OFF Switch.

This is a two position switch and switches the monitor speaker "ON" or "OFF".

2.7 RF Gain Control.

This control is located to the immediate right of the Tuning Dial and controls the RF sensitivity. A calibrated scale is provided.

2.8 Aerial Trimmer.

This calibrated control permits precise tuning of the input circuit. It is situated at the left of the tuning dial and should be adjusted for maximum sensitivity after tuning to the incoming signal.

2.9 AF Gain Control.

This is situated above the BFO control. It controls the volume from the speaker or headphones by altering the input to the first AF amplifier.

2.10 BFO Control.

This control is at the left hand lower corner of the panel and operates when the Facility Switch is at "BFO ON". It varies the beat note obtainable, between 0 and 2,000 cycles on either side of the centre bar.

2.11 Main Tuning Dial.

This control is located in the left centre of the front panel. On turning the dial, at each 1/5th of a full revolution, a number will appear in the window

opposite the pointer. These numbers are from 0 to 500, in tens, and the dial is also calibrated in units so that readings can be made with an accuracy of one part in 500, or better.

To set the reception set at the required frequency, the appropriate coil unit is plugged in and from its calibration curve, the required dial reading is obtained. The dial is then set to this reading.

2.12 The Coil Units. (See Fig. 2)

Four plug-in coil units are carried, each marked with its frequency coverage and a calibration curve showing "Dial Reading" horizontally and "Corresponding Frequency" vertically.

A small "Station Reading Chart" is attached to each coil box for recording the dial readings of stations.

2.13 Crystal Switch.

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

2.14 Selectivity Control.

This only operates when the Crystal Filter is operating. When this filter is in use, minimum selectivity is obtained with the pointer at minimum.

With the selectivity in the maximum position, the filter may be too selective and speech not intelligible. Whilst high selectivity may be desirable for CW signals, it will be necessary to resort to minimum selectivity for RT signals.

2.15 Phasing Control.

This control is directly below the Selectivity Control. Its function is to assist in the elimination of undesirable signals.

When the pointer is at the centre bar, the crystal is centrally phased.

2.16 Lamps Operator Terminals.

These two terminals, situated at the bottom right of the panel, provide a 12 volt output for an operator's lamp on all positions of the Power Selector Switch.

2.17 Output and Muting Jacks.

Two 600 ohm output jacks are situated at the top left of the panel, for connection to receivers or a 600 ohm line.

Normally this connection is made to RCU1 or RCU2 (See Section 4).

The Muting Jack is also normally connected to the Wireless Set No. 153 via a Remote Control Unit. This is dealt with more fully in Section 4.

2.18 Fuzes and Pilot Lamp.

Three fuzes are incorporated in the set and are readily accessible in the top right corner of the panel. They are:-

(1) 10 amp DC fuze for operation with 12 volt secondary battery.

(2) 3 amp AC fuze for operation on 220 volts AC or 110 volts AC.

(3) 250 mA fuze included in the HT supply to the valves.

The red pilot lamp lights when power is switched on by the "ON-OFF" Switch.

Section 3

Summary of Circuit Arrangement

3.1 General Summary and Block Diagram.

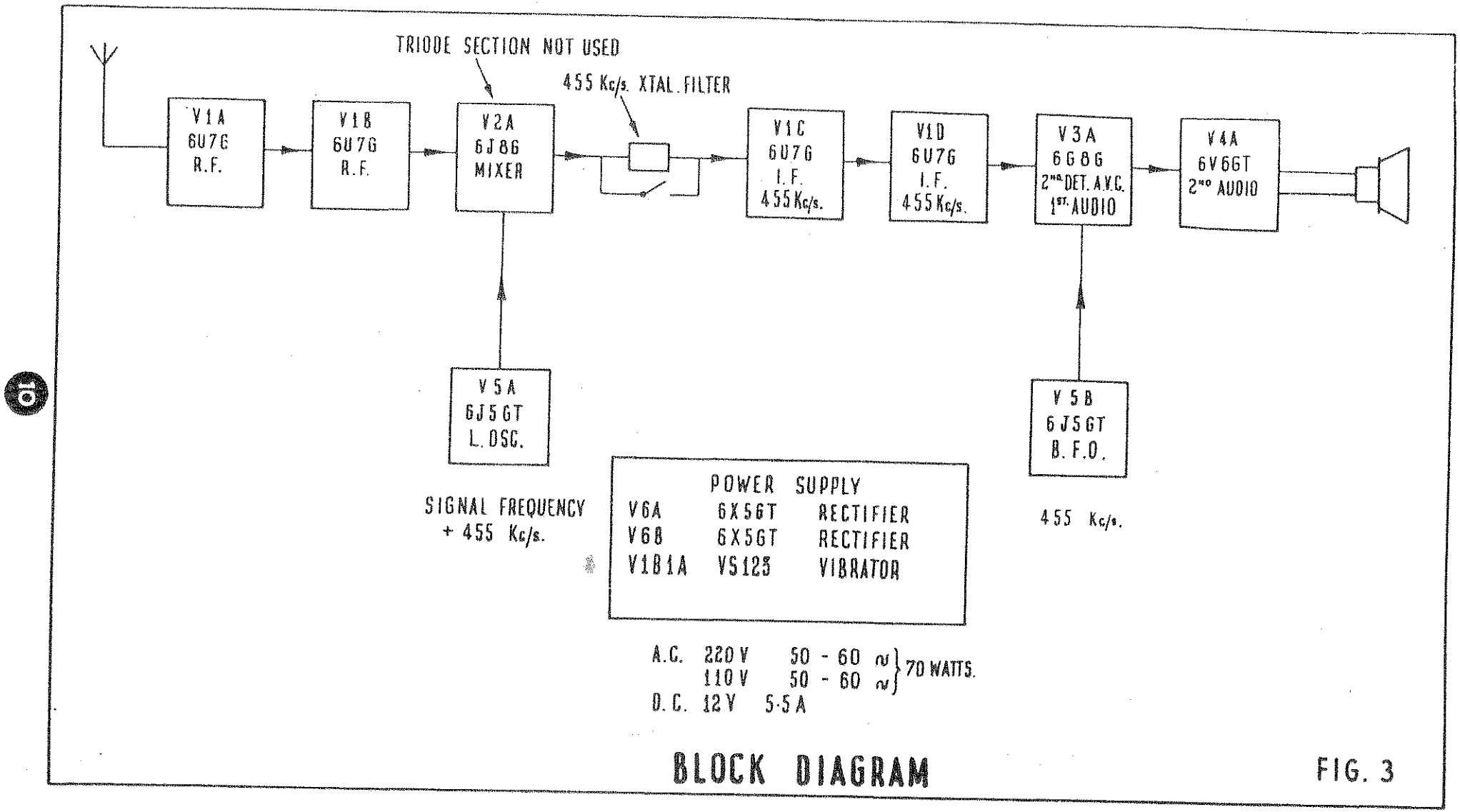
The Block Diagram of the Reception Set (Aust.) No. 8C and the power supply is shown in Fig. 3.

Reception Set (Aust.) No. 8C comprises a 9 valve, 4 band superheterodyne receiver, containing a built-in power supply section for operation from 110 volts or 220 volts AC, or from 12 volts DC.

The Intermediate Frequency is 455 Kc/s, the local oscillator frequency being higher than the signal frequency.

Two RF and two IF amplifiers are used, followed by a diode-detector and two AF output stages. The first AF stage is contained in the same valve as the diode-detector. A crystal filter is incorporated in the IF amplifier for increased selectivity and may be cut out when not required.

A beat frequency oscillator is provided for heterodyne reception of CW signals.



BLOCK DIAGRAM FIG. 3

Chapter II
Operating Procedure

Section 4
Connecting Up

4.1 Reception Set located with Sender WS 153.

(1) Connect the 220 volts or 110 volts AC input via Connector, 3 Point (Aust.) No. A6 (marked blue) to the Power Control and Minor Rectifier Unit of Wireless Set No. 153 (marked maroon).

(2) Connect Aerial and Earth to the "AE" and "E" terminals on RCU1. These terminals are connected to the aerial and earth terminals of the reception set via Connector Twin (Aust.) No. 15.

(3) The muting jack and output circuit of the reception set are connected to RCU1 by use of Connector 4 Point (Aust.) No. A5 (marked apple green). At one end this connector has a 4 pin termination which plugs into a socket on RCU1. At the other end the connector has two single circuit plugs marked No. 9 and No. 10 respectively. The No. 10 plugs fits into the Muting Jack and the No. 9 plug into one of the 600 ohm Line Jacks of the reception set.

(4) The other 600 ohm Line Jack is for a pair of Receivers, headgear, C, double, LR, Mark 3 (Aust.), if required in addition to those on RCU1 and the speaker

4.2 Reception Set at Remote Point.

(1) Connect the 220 volts or 110 volts AC input to the reception set via Connector 3 Point (Aust.) No. A8.

If AC supply is not available, use 12 volts DC via Connector 3 Point (Aust.) No. A9 to the 3 pin triangular socket marked "DC Input".

(2) The remaining instructions are the same as for the reception set located with the sender (sub-section 4.1 above), except that RCU2 should be substituted for RCU1.

4.3 Reception Set used alone.

The power supply connections will be the same as in sub-section 4.2 (1).

The aerial and earth connections will be made direct to the reception set. Aerials with coaxial

feeders of from 50 to 100 ohms impedance are connected to the special socket provided in the top left hand corner of the set.

4.4 Precautions.

When removing or changing coil units, the HT must be switched off by the Facility Switch to eliminate the possibility of short circuiting the high tension supply.

Always check that the Power Selector Switch is in the correct position to match the value of the power supply being used, before switching the "ON-OFF" switch to "ON".

Section 5

Operating Instructions

5.1 Setting the Tuning Dial.

(1) Ensure that the correct coil unit is in position.

(2) From the graph on the coil box obtain the approximate setting of the tuning dial and set it at this position.

(3) Check that the Power Selector Switch is in its correct position.

(4) Switch "ON-OFF" switch to "ON" - the pilot light should light.

5.2 CW Operation without Crystal Filter.

(1) Set Crystal Switch to "OUT".

(2) Set Facility Switch to "BFO ON".

(3) Set BFO Control to centre.

(4) Since the AVC is inoperative, the AF Gain Control may be advanced to maximum and the sensitivity controlled by the RF Gain Control.

(5) Tune in the signal by rotating the tuning dial. Adjust aerial trimmer for maximum volume. Adjust tuning dial for zero beat with the signal.

(6) Vary the BFO Control to obtain a convenient beat note.

5.3 CW Operation with Crystal Filter.

(1) Set the Crystal Switch to "IN".

(2) Set the Selectivity Control to "MIN".

(3) Set the Phasing Control to centre.

(4) Set BFO Control to centre.

(5) Set Facility Switch to "BFO ON".

(6) Tune the Reception Set to zero beat as in 5.2. above and then set the Selectivity Control to "MAX". Now, as the Reception Set is tuned slowly across the carrier, the beat note will be sharply peaked at one point. At all other points the beat note will be weak, and furthermore, this peak will only occur to one side of the carrier. If an interfering heterodyne is present it can be eliminated or greatly reduced by adjusting the Phasing Control.

5.4 RT Operation without Crystal Filter.

(1) Set Crystal Switch to "OUT".

(2) Set Selectivity Control to "MIN".

(3) Set BFO Control to centre of bar.

(4) Set Facility Switch at "AVC ON" or "AVC OFF" as required.

(5) If AVC is not used, the AF Gain Control may be set in the maximum position and the sensitivity regulated by the RF Gain Control.

(6) If the RT carrier is weak, the Facility Switch may be set to "BFO ON" position to assist in locating it. After tuning the Reception Set to zero beat with the carrier by means of the tuning dial, the Facility Switch is then returned to the "AVC ON" or "AVC OFF" positions as desired, and the Aerial Trimmer is tuned for maximum response.

(7) The Gain Controls are then adjusted for the desired output.

5.5 RT Operation with Crystal Filter.

(1) The use of the Crystal Filter for RT reception is recommended when adverse conditions of interference, static, heterodyne, etc., are present.

(2) Set the Crystal Switch to "IN".

(3) Set the Selectivity Control to "MIN".

(4) Set the Phasing Control to centre.

(5) Set the BFO Control to centre.

(6) Set Facility Switch to "AVC ON" or "AVC OFF" as desired.

(7) Proceed as in Section 5.4 (5) to (7).

(8) The principal advantage of the Crystal Filter is its ability to eliminate heterodyne whistles. These may occur from an interfering station after a signal has been tuned in and would ordinarily render the speech unintelligible. Careful adjustment of the Selectivity and Phasing Controls will, in most cases, completely eliminate the interfering station and heterodyne signal. The Phasing Control can eliminate only one signal at a time, but even if an additional interfering station comes on, there will then be only one heterodyne to contend with instead of several which would result from interaction between three carriers.

Chapter III
Maintenance in the Field

Section 6
Daily Maintenance

6.1 Introduction.

This chapter deals only with the maintenance which is performed by the operator. It is not intended to outline methods of fault finding or repair of the set.

It is the operator's responsibility to test the set daily and see that it is functioning correctly, to examine all external parts for wear and damage and to keep the set and accessories clean and tidy. It is also the operator's responsibility to report all faults, falling off in performance and any damage to the equipment.

6.2 Power Supply.

If the set is being used in conjunction with a sender, the operation will normally be from 110 volts or 220 volts and the maintenance of the power supply will be part of the maintenance of the sender. The power supply connector to the receiver should be examined for faults, such as cuts, strains at plugs, damaged fittings, etc.

If the set is being operated from secondary batteries the condition of the batteries should be checked daily and recharging carried out if necessary. Refer to the label in the lid of the battery box for correct specific gravity of electrolyte and other instructions. If working in the open, set the battery boxes in a bed of sticks, or by some means ensure that the battery boxes are not placed directly on damp earth. Always check the condition of the batteries before closing down.

6.3 Leads and Connectors.

Although the power connector lead was referred to specifically in Section 4.1, operator's maintenance should include the regular, inch by inch, examination of all leads and connectors, and associated plugs and fittings. Plugs should fit firmly in the jacks and should not show signs of pulling away from the cables. Cuts and damage to the cables should be bound with electrician's tape, or reported for attention. Headsets should be cleaned and examined for dirt or rust on the diaphragms, which should be wiped clean. Diaphragms must not be removed or subjected to any treatment which may distort them.

All leads should then be connected up, the set switched on, and tuned to a clear station (RT if available) and each lead moved gently but firmly, while carefully listening to hear if any crackling noises correspond to the movement of a lead. If a noise is discovered it should be reported, as it may be indicative of loose or frayed connections.

6.4 Checking of Front Panel.

A coil unit should be in place and pressed right home so that the rubber seal is touching all around.

The monitor speaker grille should be examined to see that the plastic moisture seal is intact.

Lift the jack and AC input covers and check that the rubber sealing pads are in place and not working loose.

Working, say, from left to right of panel:-

(1) Check all switches for firmness of mounting and positive action.

(2) Check controls for firmness and smooth turning (the RF and AF Gain Controls should also be checked for noisy operation).

When power is connected, note whether the pilot lamp is working.

Section 7

Weekly Maintenance

7.1 Removing Chassis from Case.

(1) Loosen the six (6) captive screws around the edges of the front panel. (NOTE - a penny or similar coin will fit the slots of these screws, also the fuze holders).

(2) Grasping the handles of the front panel, work the set up and down firmly before attempting to draw the set from the case, so that the front panel can "break" loose from the rubber sealing gasket.

(3) Ease the set out to the limit of the travel of the runners. The operator should not normally require to remove the set from the runners.

(4) Any dust or fluff that is present should be carefully brushed or blown away, care being taken to avoid driving dust into the set. If fluff has collected between the plates of the main tuning condenser, get a mechanic ONLY to clean it.

(5) In this position, see that all the valve base clamps are in the lock position, with the valve right down in the socket, and all grid leads firmly on.
An open filament in a valve can be quickly detected by examining each valve to see if it is glowing. Normally the glow should be visible, or if the set has been on for more than ten minutes, the glass envelope of each valve will be distinctly warm to the touch.

7.2 Aerial Gear.

The masts should require no particular attention, other than ensuring that they are not overloaded. Overloading can result from defective or incorrect guying, and the guys should be checked for correctness of arrangement and even distribution of load. When the guys are rolled up for storage they should be carefully arranged to prevent tangling. The insulators used are fragile and should not be dropped.

The coaxial cable should never be bent sharply, nor should the bare copper wire of the aerial be sharply bent or kinked. Any kinks which may occur should be firmly rolled out to conform with the lay of the wire.

The insulators used with the aerial gear are liable to introduce losses or noise, particularly in damp locations or wet weather, and the effect of moisture is greatly aggravated if the insulator is dirty, dusty or greasy. It is essential to keep the insulators clean.

Section 8

Conclusion

8.1 Fault Finding and Running Repairs.

(1) Causes of Faults. The faults that cause the performance of the set to deteriorate may be either external or internal, those occuring internally requiring skilled attention, whilst those that occur externally may be within the operator's ability to remedy. Faults may be due to three causes:-

(i) Disconnections.

(ii) Short circuits.

(iii) Changes in the electrical properties of, or failure of components.

(2) Operator's Responsibility. The general procedure when a set is found to be working unsatisfactorily is to check the external parts of the set first and then proceed to the internal parts. The operator will deal with only the external parts, with the exception of the replacement of fuzes, pilot bulbs and valves and the vibrator.

NOTE - If a valve, pilot light, fuze or vibrator fails again immediately on being replaced, in NO circumstances will a further replacement be made without consultation with a mechanic or a superior officer.

(3) Checking for External Faults.

(i) Power Supply. Power may be disconnected either wholly or partially, partial connection frequently being accompanied by excessive noise in the receiver, and cracklings if the lead is moved or the set bumped.

(ii) Receiver Output Circuits. (Telephones and Speaker). Check by substitution (e.g., if using the speaker, try headsets in various jacks).

(iii) Aerial Gear. Check whether the aerial is still standing and trace the lead in from the aerial.

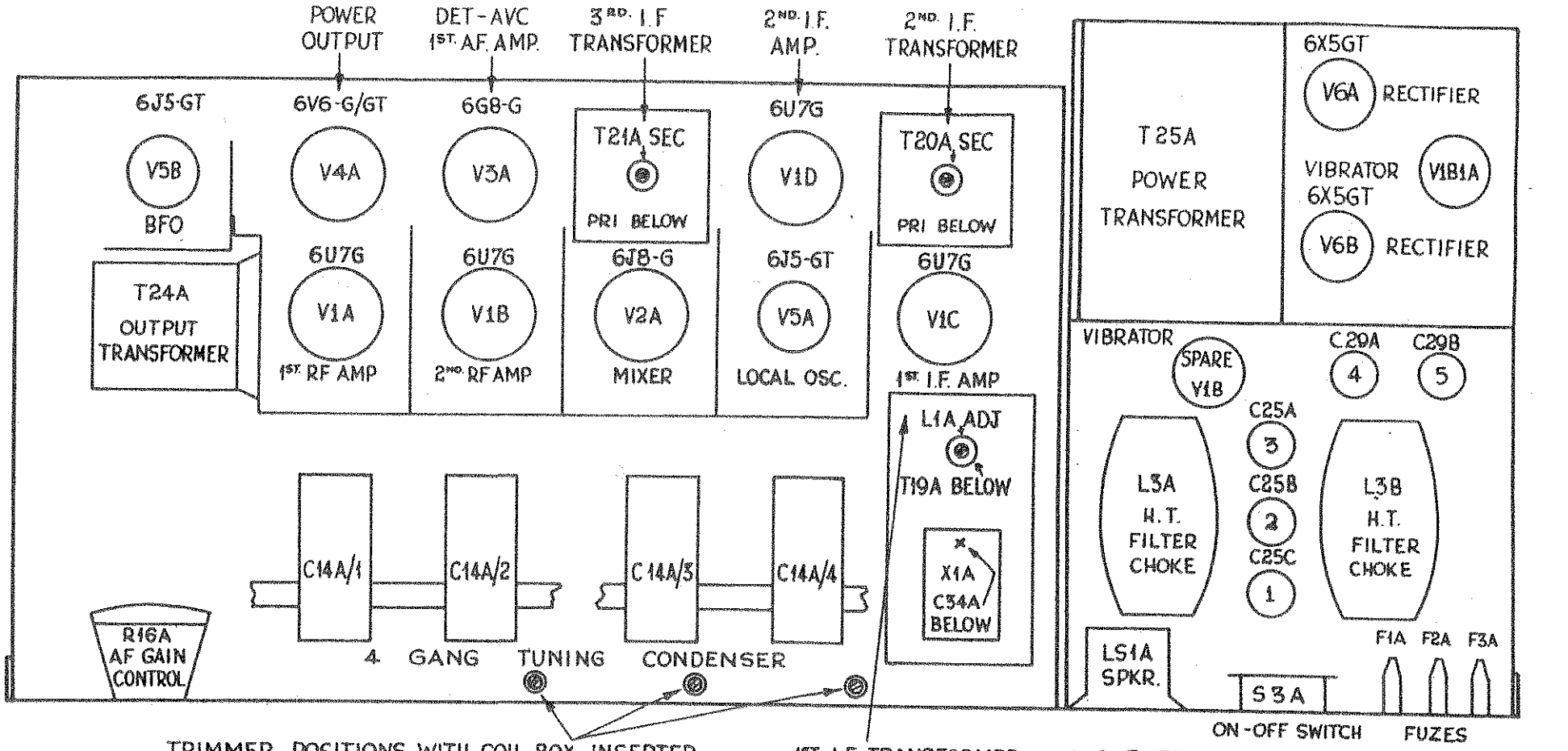


FIG. 4 : LAYOUT OF COMPONENTS

(4) Checking for Internal Faults.

(i) Replacement of Fuzes. These are mounted on the front panel, and may be checked by examination on removal from the holder.

(ii) Valve Top Connections. (Grid caps). These may become loose, or become entirely disconnected. (Refer to Section 7.1 on removal of chassis from case.)

(iii) Valves. The heaters may become open circuited, electrodes may become loose or shorted together, or the emission may deteriorate, which results in weak or noisy reception. If there is any reason to suspect the valves they can be tested by substitution. (Refer to Section 7.1 on removal of chassis from case.)

(5) With the spares provided, the operator is permitted to:-

Change (i) Earcushions, telephone,

(ii) Bulbs, 12-V in set indicator,

(iii) Lamps operators, No. 6 (Aust.),

(iv) Fuzes in holders in front panel,

(v) Valves. (NOTE - It is preferable to have a mechanic check when valve replacements are required.)

(vi) Vibrator. (NOTE (v) again applies.)

8.2 General.

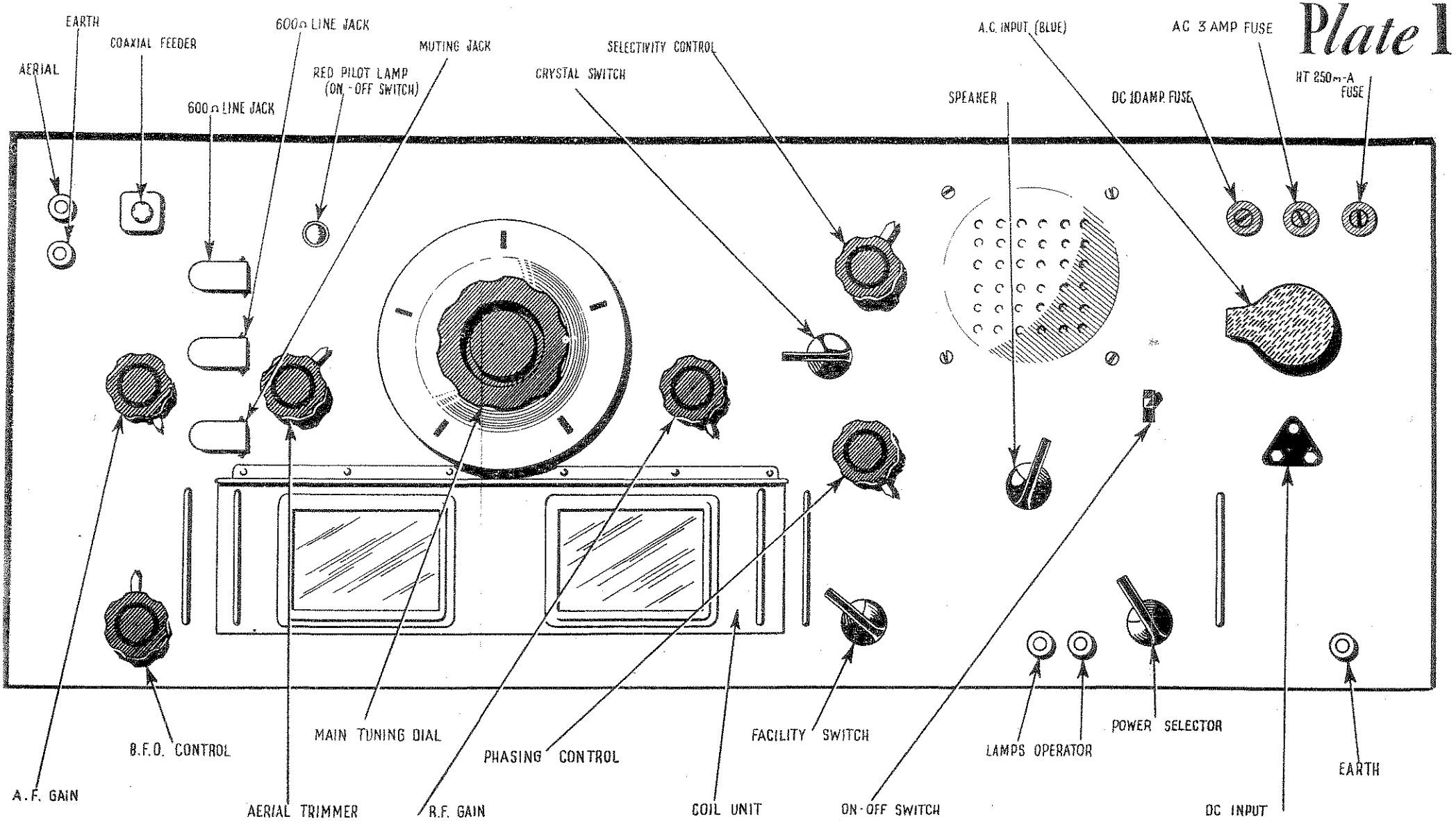
For the operator's maintenance to be effective, it is essential that the cleaning and examination should be thorough and regular. Within a detachment which uses the Reception Set (Aust.) No. 8C, daily maintenance should be instituted as a drill, which, as operators become familiar with the equipment, can easily be made to cover the majority of the points mentioned in this chapter.

8.3 Weekly and Monthly Maintenance.

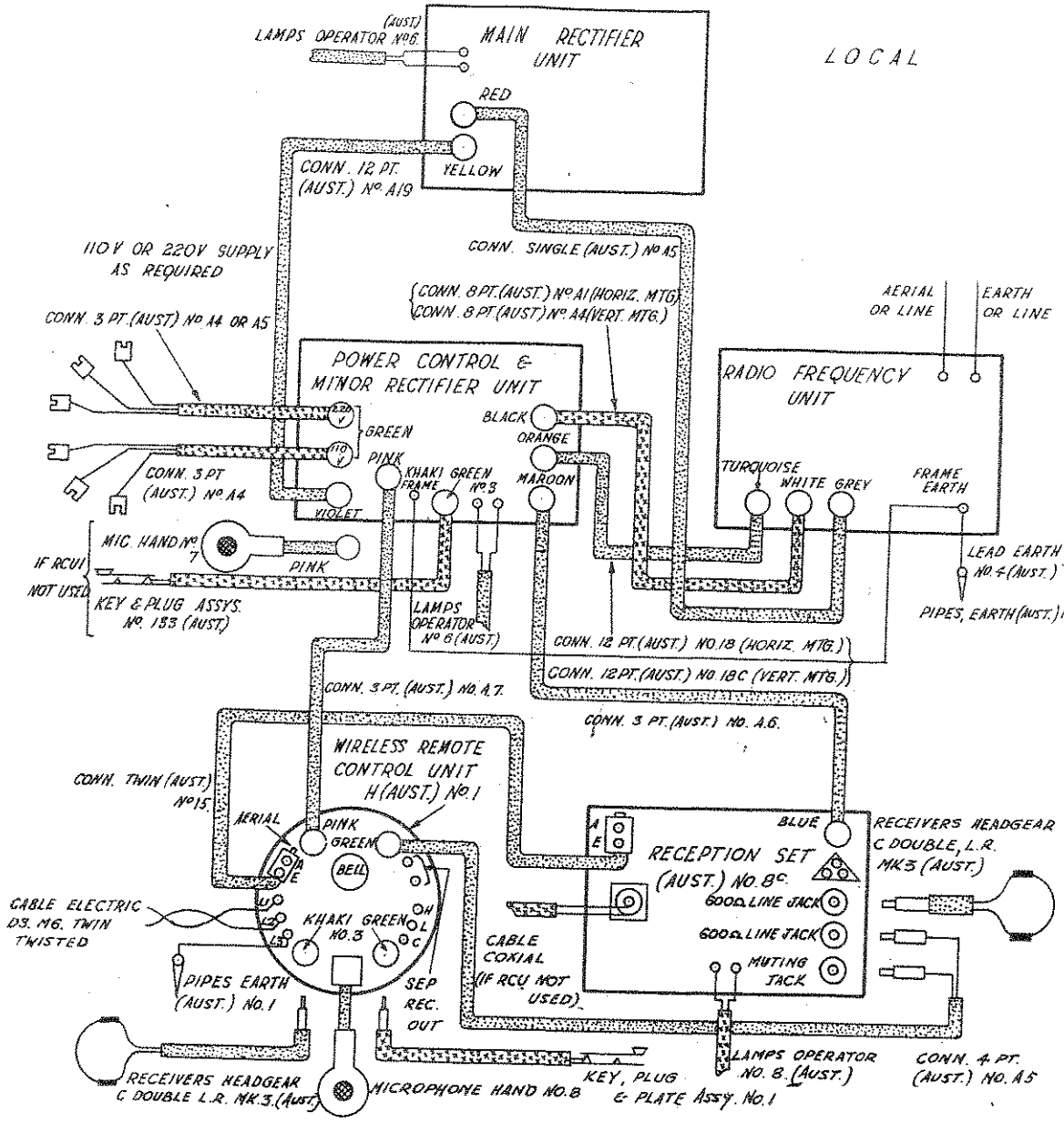
(1) Weekly Maintenance in this instance will be a thorough and complete check of every item quoted in this chapter.

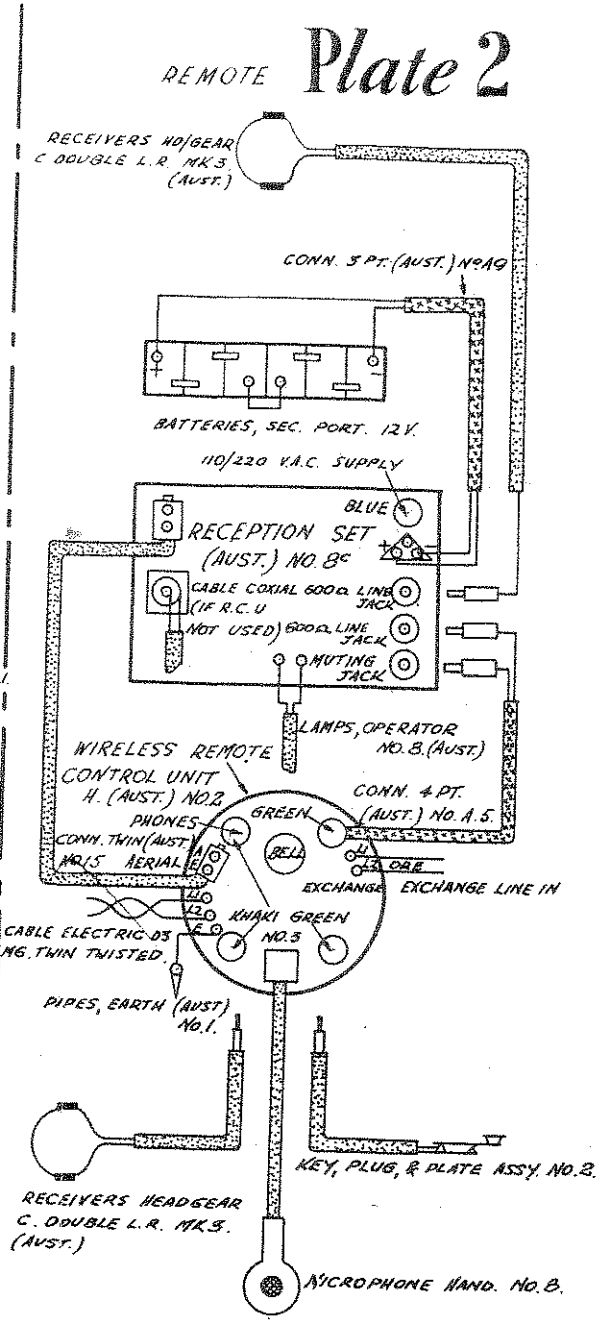
(2) Monthly Maintenance. At least once a month, a mechanic using test equipment should check the performance of the receiver, but in the type of detachment making use of this particular equipment, a mechanic will probably be available more frequently than once a month. It is then the responsibility of the OC Detachment to determine when the mechanic will attend to the equipment.

Plate I



PANEL DIAGRAM

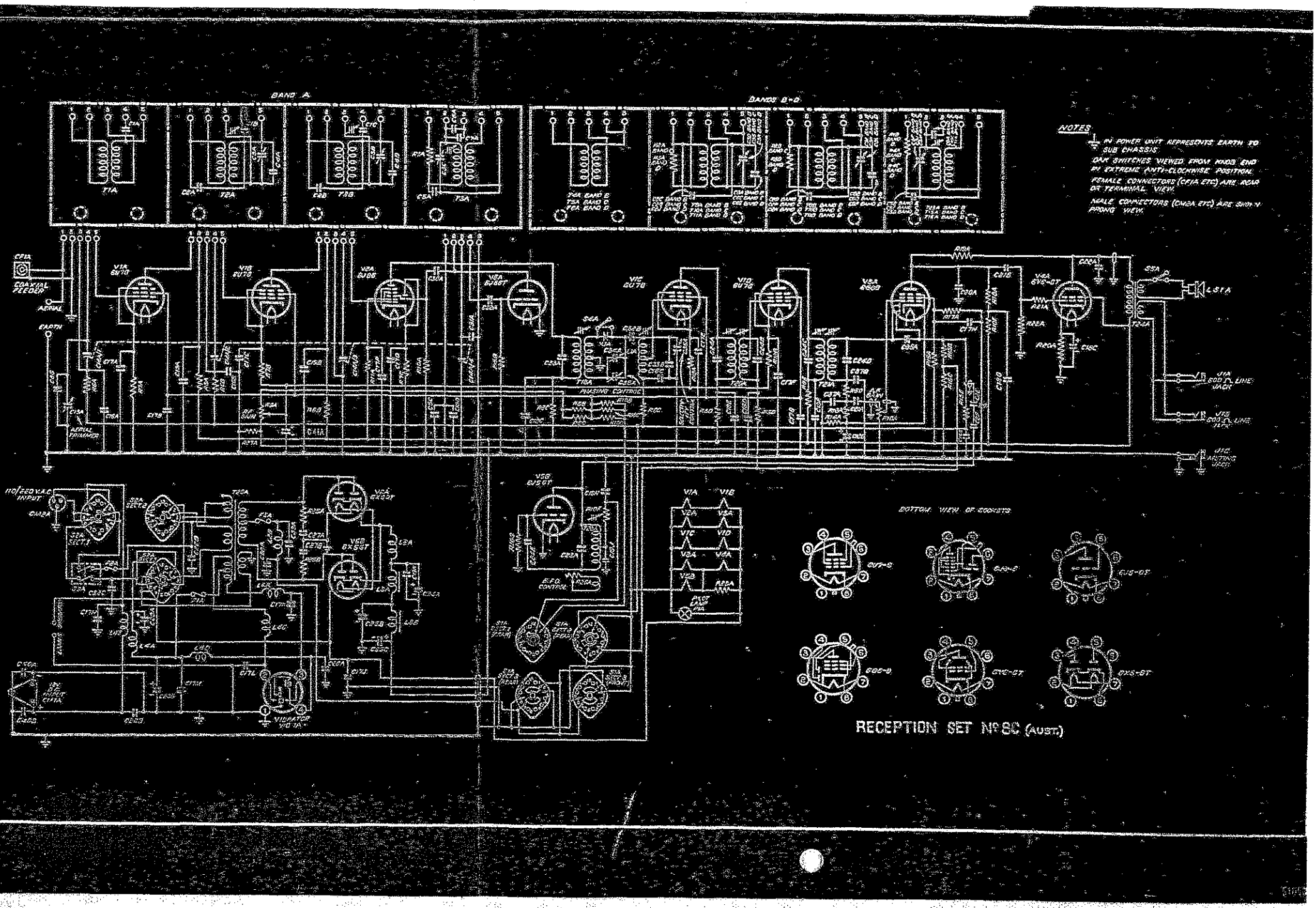




W.S. 153 .. INSTALLATION INTERWIRING

COMPONENT LIST

R1A, R1B	[illegible] OHMS
R2A, R2B	[illegible] OHMS
R3A, R3B	[illegible] OHMS
R4A, R4B, R4C	32,000 OHMS
R5B, R5C	40,000 OHMS
R6A, R6B, R6C, R6D	0.1 MEGOHM
R7A, R7B, R7C	320 OHMS
R8A, R8B, R8C, R8D, R8E	2,000 OHMS
R9A	3,000 OHMS
R10A, R10B, R10C, R10D, R10E, R10F, R10G	50,000 OHMS
R11A	83,000 OHMS
R12A, R12B	630 OHMS
R13A	0.25 MEGOHM
R14A	3,200 OHMS
R15A, R15B, R15C, R15D, R15E	1 MEGOHM
R15A	1 MEGOHM, POT.
R17A	0.5 MEGOHM
R18A	0.2 MEGOHM
R19A	3.2 MEGOHMS
R20A	250 OHMS
R21A	50,000 OHMS
R22A	0.5 MEGOHM
R23A	45 OHMS
R25A, R25B	100 OHMS
R26A	250 OHMS
R27A	10,000 OHMS
C1A, C1B, C1C	480 μμF ±2½% 500VW
C2A, C2B, C2C, C2D, C2E, C2F, C2G, C2H, C2J, C2K	4 μμF 500VW
C3A, C3B, C3C, C3D, C3E, C3F, C3G, C3H, C3J, C3K, C3L, C3M	3-25 μμF, VAR.
C4A, C4B	14 μμF 500VW
C5A, C5B, C5C, C5D, C5E	0.01 μF 500VW
C6A	200 μμF ±2½% 500VW
C7A	200 μμF 500VW
C8A, C8B, C8C, C8D, C8E, C8F, C8G	9 μμF 500VW
C9A	3,000 μμF ±2½% 500VW
C10A	2,000 μμF ±2½% 500VW
C11A	1,200 μμF ±2½% 500VW
C14A	18-245 μμF VAR. 6 GANG
C15A	4-40 μμF VAR.
C16A, C16B, C16C, C16D, C16E	0.05 μF 200VW
C17A, C17B, C17C, C17D, C17E, C17F, C17G, C17H, C17J, C17K, C17L, C17M, C17N, C17P	0.1 μF 200VW
C18B, C18C	25 μF 40VP
C19A, C19B, C19C, C19D, C19E, C19F, C19G, C19H, C19J, C19K	0.1 μF 600VW
C20A	500 μμF 500VW
C21A, C21B	0.01 μF 200VW
C22A, C22B, C22C	0.02 μF 600VW
C23A	760 μμF 500VW
C24A, C24B, C24C, C24D, C24E	250 μμF 500VW
C25A, C25B, C25C	20 μF 600VP
C26A, C26B	0.5 μF 200VW
C27A, C27B	0.03 μF 600VW
C28A	5,000 μμF 500VW
C29A, C29B	100 μF 40VP
C30A	6 μμF 500VW
C31A	12 μμF 500VW
C32A, C32B	60 μμF 500VW
C33A, C33B	50 μμF 500VW
C34A	3-30 μμF VAR.
C35A	3-9 μμF VAR.
C36A	3.5-17 μμF VAR.
C37A, C37B	100 μμF 500VW
C38A	50 μμF 500VW
C39A	0.25 μF 600VW
C40A, C40B	0.01 μF 500VW
C41A	6 μF 525VP
L1A	OUTPUT I.F. CRYSTAL FILTER
L2A, L2B	CHOKE, RF 500 μH, 150 mA
L3A, L3B	CHOKE, FILTER 6H, 100 mA
L4A, L4B, L4C, L4D, L4E	CHOKE, RF 20 μH CA
T1A	BAND A, AER.
T2A	BAND A, 1ST RF
T2B	BAND A, 2ND RF
T3A	BAND A, OSC.
T4A	BAND B, AER.
T5A	BAND C, AER.
T6A	BAND B, AER.
T9A	BAND B, 1ST RF
T9B	BAND B, 2ND RF
T10A	BAND C, 1ST RF
T10B	BAND C, 2ND RF
T11A	BAND D, 1ST RF
T11B	BAND D, 2ND RF
T15A	BAND C, OSC.
T16A	BAND D, OSC.
T19A	INPUT, I.F. CRYS. FILTER
T20A	1ST IF TRANS.
T21A	2ND IF TRANS.
T22A	B.F.O. COIL
T23A	BAND B, OSC.
T24A	OUTPUT TRANS., 5,000 OHMS TO 3.7 & 600 OHMS
T25A	TRANS., POWER
S1A	FACILITY SWITCH
S2A	MAINS SELECTOR
S3A	ON-OFF SWITCH
S4A	CRYSTAL IN-OUT
S5A	SPEAKER, ON-OFF
J1A	600 OHM LINE JACK
J1B	600 OHM LINE JACK
J1C	MUTING JACK
F1A	FUSE 10A BTY. IN
F2A	FUSE, 3A AC IN
F3A	FUSE, 250 mA HT
V1A	6U7G 1ST RF AMP
V1B	6U7G 2ND RF AMP
V1C	6U7G 1ST IF AMP
V1D	6U7G 2ND IF AMP
V2A	6J8G FREQ. CONV.
V3A	6Q8G DET. AVC & AF AMP.
V4A	6V6-GT OUTPUT
V5A	6J5-GT LOCAL OSC.
V6B	6J5-GT BEAT FREQ. OSC.
V8A	6X5-GT, RECT.
V8B	6X5-GT, RECT.
X1A	CRYSTAL, 455 kc.
P1A	PILOT LAMP
LS1A	LOUDSPEAKER
VIB1A	VIBRATOR


BAND A
BANDS B+D
NOTES
⏚ IN POWER UNIT REPRESENTS EARTH TO SUB CHASSIS
GANG SWITCHES VIEWED FROM KNOB END IN EXTREME ANTI-CLOCKWISE POSITION
FEMALE CONNECTORS (C1A ETC) ARE AS IN TERMINAL VIEW.
MALE CONNECTORS (CN2A ETC) ARE SHOWN PRONG VIEW.
BOTTOM VIEW OF SOCKETS
RECEPTION SET No 8C (AUST.)