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WIRELESS SET No. 101

Mark I and Mark II

1941

MILITARY BOARD.

Army Headquarters, Melbourne,
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Amendments will be published in Australian
Army Orders.

A handwritten signature in dark ink, appearing to read 'C.B. Laffan'. The signature is fluid and cursive, with a prominent flourish at the end.

Secretary to the Board.

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WIRELESS SET No. 101

Description

CHAPTER I

Section 1—GENERAL CONSIDERATIONS

1. General:—

The Wireless Set No. 101 is designed for C.W. Wireless Telegraphy (W/T) and for Radio Telephony (R/T). It may be used as a portable field station, erected on the ground, or as a mobile station, when it may be used to send or receive messages while on the move. When using the set in a vehicle, it may be necessary to suppress interference from the ignition system and other electrical equipment.

2. Range (Distance):—

Its working ranges under average conditions are:—

- (1) 6-8 miles using R/T; with the two stations erected on the ground.
- (2) 4-6 miles using R/T; with both stations mounted in moving vehicles.
- (3) A much greater range can be obtained using W/T, or by the use of special aerial systems.

3. Power Supply:—

The whole of the power supply is provided by means of a 6 volt 25 Ah secondary battery, which heats the filaments and provides the input power to a vibrator type of high tension unit.

4. Aerials:—

The aerial is such that it can be varied considerably in actual and effective height. It consists of a single vertical mast in sections, which is also the conductor, supporting a "Top" of four light rods radiating horizontally. It is mounted on a special insulated picket and is normally self-supporting. The normal height for a range of 6-8 miles when using two ground stations is nine feet, but greater ranges will be obtained by increasing the height to fifteen feet, using special stay plate provided.

The earth consists normally of four insulated counterpoise wires spread on the ground to form a rough cross.

The aerial used in the vehicle is an "Aerial, flexible, with base," which may be fitted to bracket provided on "Cabinets, Wireless, L.P. No. 3," or to bracket on rear of Vans, Wireless.

The metal of the vehicle chassis is used as a counterpoise when the set is used in a vehicle.

5. Range (Frequency):—

The frequency range over which the set is designed to operate is 4.28 to 6.66 Mc/s or 71.5 to 44 metres. To ensure that the accuracy of calibration is maintained, the sender should be checked periodically

against a frequency meter. An adjustment is provided by means of which the calibration may be corrected if found necessary.

6. Frequency Separation:—

Two senders working on frequencies differing by 20 Kc/s can be readily separated by a receiver, provided that both senders are one mile or so from the receiver. The distance will vary according to the height of the aeriels used, the distance given in paragraph 2 being for a normal aerial 9 ft. high with a "top." If the frequency separation is increased to 100 Kc/s the interfering sender may be only 200 yards from the receiver without causing serious interference. These figures apply to R/T and may be less for W/T. They will also vary according to local conditions and should be taken only as a guide.

7. Wireless Remote Control Units "A"—

Provision for using Remote Control Units has been made in the Wireless Set No. 101.

8. Weights and Sizes—

The weights (to the nearest half-pound) and sizes of the main components of the complete station are given in Table I.

TABLE I.

| Component. (1) | Weight lb. (2) | Length (3) | Overall Height (4) | Depth (5) | Remarks (6) |
|--|----------------------|---------------|--------------------------|--------------|----------------------------------|
| 1. Combined Sender and Receiver (including 1 pair receivers, head-gear and 1 microphone hand). | 38 | 21½ in. | 12 in. | 8 in. | |
| 2. Vibrator Unit No. 101 (including spare vibrator No. V-5211). | 24 | 16¾ in. | 10 in. | 4½ | |
| 3. L.T. Battery. | 24 | 9¾ in. | 9¼ in. | 7 in. | Battery Secy. Port. 6 volt 25 Ah |
| 4. Aerial Gear in "Bags, Aerial Gear No. 2." | 13 | 3 ft. 6 in. | — | 6 in. | |
| 5. Spare Valves in "Cases, Valve and Receiver." | 8½ | 10 in. | 9 in. | 7½ in. | |
| 6. Wireless Remote Control Unit "A." | 10½ | 9½ in. | 5¾ in. | 5¾ in. | |
| 7. Microphone Hand and one pair Receivers Headgear in "Bags Telephone Receiver" for use with Remote Control Units. | 3 | | | | |
| 8. Connectors, Twin No. 18. | 7 | | | | Used with Remote Control Units |

Section 2—OPERATION

1. Connecting in the Field:—

- (a) Put together and erect the aerial. The mast stands on an aerial base mounted on an iron spike which is pushed into the ground. The stays must be used in windy weather and if the aerial is more than 9 ft. high.
- (b) Stand the set with its back to the aerial and connect the red aerial terminal to the aerial base.
- (c) Connect a set of counterpoise wires to each "Earth" terminal on the set.
- (d) Stand the 6 volt battery and the high tension unit to the left of the set and connect them to the set by means of the leads and connectors provided, making the connections to the battery last.
- (e) Plug a microphone, hand, and a pair of Receivers, Headgear, Double, into the jacks marked "Microphone" and "L.R. 'Phone'" respectively.
- (f) Open valve door and make sure that all valves are in their respective sockets and the grid caps connected. See that valves are pushed right home in sockets and that grids are clear of the valve door.
- (g) Close the valve door.

2. Tuning Sender:—

- (a) Loosen the lock knob on MASTER OSCILLATOR dial by turning anti-clockwise. Set the dial to the frequency required and lock it by re-tightening the lock knob.
- N.B.—For frequencies on the outer scale RED must show in the window between the pointers, and the RED pointer be used. For inner scale of frequencies WHITE must show in the window and the WHITE pointer be used.
- (b) Turn the SPEECH-CW switch to SPEECH.
 - (c) Turn SEND-RECEIVE switch to SEND.
 - (d) Turn Vibrator unit switch to ON.
 - (e) Adjust the AERIAL TAP and AERIAL TUNE until maximum aerial current is obtained.
 - (f) Turn SPEECH-CW switch to CW. The sender is now ready for telegraphy.
 - (g) For telephony, adjust as for (e) above.
 - (h) Speak slowly and fairly loudly, close to the microphone mouth-piece. The flat side of the microphone holder should be kept vertical. The aerial current should increase slightly when speaking. If it does not do so, adjust AERIAL TAP to lower value and readjust AERIAL TUNE for maximum current.

If current still decreases on speaking, adjust screen tap on H.T. unit where fitted, until current increases when speaking. This rise in current when speaking is necessary to avoid distortion of speech.

On senders equipped with a NET position on the SEND-RECEIVE switch the procedure for adjusting the sender for "Group" working is as follows—

- (i) Tune receiver to signal of controlling station as in 3 (d) (ii) below.
- (j) Turn SEND-RECEIVE switch to NET.
- (k) Adjust MASTER OSCILLATOR dial until signal of Master Oscillator is heard at zero-beat. Lock dial. The Master Oscillator is now set exactly to the frequency of the controlling station.
- (l) Proceed as for (b) above.

Note that the divided scales on the pointers are not subdivisions of the main dial-plate, i.e., they do not represent absolute frequency-differences. Their function is to facilitate the recording of dial settings which do not coincide exactly with the centre-line on the pointer. For instance, a setting just greater than 6.42 Mc/s may be stated as $6.42 + 2$ Mc/s.

Tuning Receiver:—

- (a) Loosen the lock knob on the calibrated dial by turning anti-clockwise.
- (b) Set the calibrated dial to the frequency to be used and lock the dial. Set the TUNE AERIAL dial and the VOLUME control to half scale.
- (c) Turn the SEND-RECEIVE switch to RECEIVE.
- (d) According to whether R/T or W/T is to be received proceed as follows:—

R/T—

- (i) Set the SPEECH-CW switch to CW.
- (ii) Using the main wheel of the calibrated dial, search each side of the frequency to be used until the incoming signal is heard. Adjust the dial for zero-beat, i.e., midway between whistles.
- (iii) Set the SPEECH-CW switch to SPEECH.
- (iv) Adjust the TUNE AERIAL dial for maximum strength of received signal.
- (v) Adjust the strength to a satisfactory level with the volume control.

W/T—

- (i) Adjust as for (ii) above except that dial is set to produce the most readable signal.

- (ii) Bring the note to maximum strength with the TUNE AERIAL dial.
- (iii) Adjust the strength to a satisfactory level with the volume control.

CHAPTER II

Information and Instructions for the Operator

Section 3—BRIEF TECHNICAL DESCRIPTION

1. General:—

For mobile operation complete station is carried in "Cabinets, Wireless L.P. No. 3."

The complete station consists of—

- (i) The set, combining Sender and Receiver in one case.
- (ii) Aerial gear, in "Bags, Aerial Gear No. 2."
- (iii) High Tension Unit.
- (iv) Batteries, Secy. Portable, 6 volt, 25 Ah in boxes.
- (v) Cases, valve and receiver.

A pair of "Receivers, Headgear L.R.," and a "Microphone, Hand," No. 3, can be packed in the clips provided in the lid of the case.

2. Sender:—

The sender utilises a Master Oscillator-Power Amplifier circuit with grid-modulation of the amplifier on R/T. Three type 1K5G valves, in all, are used; one V1 as Master Oscillator and two V2 and V3 in parallel as Power Amplifier.

The Master Oscillator is of the self-excited type, using a conventional series-fed Hartley circuit. Referring to Diagram A24 or A24/1, the tuning inductor, L1, is fitted with an iron-core adjustment, which is used in conjunction with C1 to adjust the frequency calibration of the oscillator. C2 is the main tuning condenser. C4 functions also as a calibrating condenser by controlling the total band width; under normal conditions, however, it will be unnecessary to change C4 after its initial adjustment. Connections of L1 are brought out to terminals numbered 1, 2, 3 and 4 as shown.

Excitation of the Power Amplifier is made by capacitive coupling via C6 and C9. This circuit is shunt-fed through L2, the anode tuning circuit C14 and L4 being coupled through blocking condenser C13. S3 and C14 constitute the ANODE TAP and AERIAL TUNE controls, respectively, and in conjunction with the aerial inductance and capacitance, form the tuned circuit for loading the amplifier.

* For W/T, the grid resistor circuits of all valves and the main H.T. negative are simultaneously keyed.

For R/T, the microphone transformer secondary is placed in series with the common grid return of V2 and V3, and connected to -18v. , via S2, microphone current being derived from the filament 6v. circuit.

3. Receiver:—

The receiver utilises a supersonic heterodyne circuit consisting of five valves in all. Referring to Diagram A-23, V1, type 1C7G, is the frequency converter stage, being controlled by gang-condenser C2, which constitutes the TUNE REC. control. The trimming condenser C3 ensures tracking of the gang, and is brought out to control marked TUNE AERIAL. L1-L2 is the aerial-grid transformer, and L3-L4 the oscillator exciting transformer. The intermediate frequency of 460 Kc/s is fed into the 1st I.F. stage V2, type 1K5G, and then to V3, type 1K7G, which functions simultaneously as a reflexed I.F. amplifier, detector, A.F. amplifier and A.V.C. rectifier. A.V.C. potential from diode-anode 4 of V3 is applied to V1 and V2 when the SPEECH-CW switch is in the SPEECH position only. When the CW position of the latter switch is used, the Beat-frequency Oscillator V5, type 1C7G, is energised, mixing with the I.F. signal being obtained by plate-modulation of V3 via the I.F. transformer L9-L10.

The A.F. signal appearing across the diode load resistor R12 is reflexed back into the control grid of V3 via R8, C16. The A.F. signal appearing across the V3 anode load resistor R14 is fed via C24 to the control grid of the A.F. amplifier V4, type 1K7G. The output transformer T1 matches two L.R. headphones to the anode of V4.

R12 functions as VOLUME CONTROL.

R6 is ganged to R12 and provides simultaneous volume and gain control by changing the negative bias on V1 and V2.

4. Send-Off-Receive-Net Control:—

The following description is correct only for 101 sets, Mark II. In Mark I sets, the switch has four poles instead of seven, and the NET position with associated connections is omitted.

The four positions of the switch control five circuits as follows:—

(a) SEND—

- (i) Aerial to sender.
- (ii) 6-v. positive to sender filaments.
- (iii) 210-v. negative to frame via telegraph key.
- (iv) 90-v. positive to P.A. screens.

(b) OFF—All associated circuits are broken.

(c) RECEIVE—

- (i) Aerial to receiver.
- (ii) 6-v. positive to receiver filaments.

(iii) 210-v. negative to frame.

(iv) Negative bias to receiver.

(d) NET—

(i) Aerial to receiver.

(ii) 6-v. positive to both sender and receiver filaments.

(iii) 210-v. negative to frame.

(iv) Negative bias to receiver.

(v) M.O. grid resistor to frame.

In the NET position the Master Oscillator and receiver are energised simultaneously, with the aerial remaining connected to the receiver. Sufficient stray coupling exists between sender and receiver for the Master Oscillator signal to be heard in the receiver, and thus permits its frequency to be adjusted exactly to that of the controlling station already tuned in.

5. Vibrator Unit:—

High tension supply is derived from a vibrator type generator driven by the 6-v. accumulator. The intermittent current produced by the vibrator is passed through a step-up transformer, and the resulting A.C. in the secondary winding of the latter is rectified by synchronous contacts on the vibrator. Orthodox low-pass filters smooth the rectified current, which is subdivided in a voltage divider.

A tapping on the divider, 18 volts from the main negative, is connected to frame and designated negative on the output terminals. The main negative pole thus becomes the 18-volt negative bias terminal in the output, and this is used to bias the P.A. of the sender under R/T conditions. The total effective voltage of the H.T. unit is thus reduced from 228v. to 210v., and intermediate values are reduced by 18v. accordingly.

The frequency of the A.C. is approximately 50 cycles/sec.

A tapping switch S2 is fitted on all Mark I power units to provide variation of screen voltage on the P.A. of the sender. This switch is omitted on Mark II units, and the screen tapping fixed on the voltage divider. Note that R3 and R5 are interchanged for this connection. Note also that all power units in which this change is made have the + 12v. and O bonded on the terminal board, and therefore the 6-v. lead to the set is actually at -18v. potential on open circuit.

Section 4—MAINTENANCE OF THE SET

1. General:—

In order to secure freedom from breakdowns, it is essential that proper care be taken of the set and its accessories. They should be examined regularly for incipient faults, so that any that are found may be put right before they can cause a breakdown at a critical moment.

The gear should be checked over in some particulars once a day.

The best time is probably when the gear is being put away at the end of the day's work, or, if the set is in continuous use, when it is taken over by the next watch. The points to examine daily are given below under the heading "Daily Maintenance."

A more thorough examination should be made at least once a week; the points to be attended to in this examination are given under the heading "Weekly Maintenance."

2. Daily Maintenance:—

The operator should see to the following points before putting the set away for the day:—

- (i) Before dismantling the station, note the aerial current produced by the sender. If this is low compared with what it was when work was begun, or, if it falls off quickly, try first a spare battery in place of that in use. If the change produces a large improvement in aerial current, say from 100mA to 125mA, have the original battery tested.
- (ii) Put the SEND-RECEIVE switch to RECEIVE and note whether the receiver is producing normal background noises or is becoming "noisy." If intermittent crackling noises are heard, disconnect the aerial. If the unusual noises cease they are probably due to atmospherics or some external electrical disturbance, in which case nothing further can be done. They may, however, be due to bad contacts in the aerial itself. Examine, and if necessary, tighten up all aerial screwed joints.

If the noises persist with the aerial disconnected—

- (a) Examine the headphone cord for signs of damage, and see that the terminals on the headphones themselves are tight. If the noise is due to the cord, it can probably be reproduced by shaking the cord or lightly jerking on the cord either at the plug or at the headphones.
 - (b) Try changing the H.T. battery where such is used in lieu of vibrator unit.
 - (c) Try changing the valves in the receiver in turn.
 - (d) Examine the battery leads for signs of damage, and the plugs to see that they all fit tightly. If no external signs of damage are present, shake the leads in turn and listen for corresponding clicks or crackling noises.
- (iii) When satisfied that everything is in good working order, clean and dry everything as it is put away.
 - (iv) Avoid opening the valve door in dusty situations, as this encourages the leakage of dust into the case through the valve sockets.

Remember that—

- (a) Water or acid may cause serious leakage of current from the H.T. battery; and that leads and plugs, the battery box, its connecting socket, and the connecting socket on the set must *always* be kept as dry as possible.
- (b) Dirt interferes with all screw threads. (Aerial gear which is left dirty will take longer to erect and may be very difficult to take apart later.)
- (c) Dust causes damage to all moving parts such as variable condenser spindles, slow-motion controls, etc., and it must be removed from the exterior and interior of the set whenever it is noticed.

3. Weekly Maintenance:—

The weekly overhaul should take about an hour. If the set is in almost continuous use, it will not perhaps be possible to see to all points at the one time. They should be attended to one or two at a time whenever quiet periods occur.

Attention should be paid to the following points:—

- (i) Examine all tuning controls and see that they work smoothly. Any control which is becoming stiff to turn should be attended to by a wireless mechanic, or it may ultimately seize. Slow-motion controls which are harsh, uncertain or noisy in action should also be attended to by the wireless mechanic.
- (ii) See that each of the small lock knobs can be screwed home without disturbing the setting of the dial knob. If any of them are tight and tend to move their dial knobs, remove them by unscrewing right out of the spindle, clean thoroughly and lightly grease or oil the thread. The surfaces of the knobs should not come into contact with each other, and it may be necessary to adjust the position of the locking knob on its spindle to avoid this effect.
- (iii) Clean all plug and socket contacts. Fine emery paper may be used if the contacts are badly tarnished, but must be used sparingly, and the brass dust carefully removed afterwards. Split plugs, which are loose or a very easy fit in their sockets, should be opened out slightly with a knife-blade or a small screwdriver. The spring H.T. contacts on the set, and at one end of the H.T. lead, should be squeezed in slightly if necessary.
- (iv) Clean the contacts of the telegraph key (the contacts farthest from the knob are used in this set). Paper must not be used for this purpose. Readjust the key if necessary.
- (v) Erect the set, and see that it works in a normal manner.
- (vi) Test all the 1K5G valves, including spares, by inserting them in turn in the appropriate position in the sender, putting the

SEND-RECEIVE switch to SEND and noting the aerial current produced with the sender set for C.W. and adjusted to a middle frequency.

- (vii) Test the 1K5G valves in the Master Oscillator position. Select the best of them for use in this position, and the next best for use in the V2 position. Valves which produce no aerial current should be rejected.

4. Locating External Faults:—

In the event of an actual breakdown the information contained in Chapter III will, in most cases, be helpful towards rapidly locating the fault. Where it appears likely that the fault is an internal one in the set itself, it must be investigated and repaired by the wireless mechanic.

5. Valve Replacement:—

The vibrator unit *must* be switched *off* before any valves are removed from the set, and *all* valves *must* be in position before using the set.

6. Vibrator Replacement:—

If unfamiliar interference is experienced on the receiver with the aerial disconnected, and if normal aerial currents cannot be obtained on the sender with the aerial connected, then the fault *probably* lies with the vibrator. It may also be due to loose battery connections which should therefore be checked carefully.

To replace a vibrator in Mark I models, loosen the clamping screw and pull the vibrator forward and then up out of the case when the pins are clear of the socket.

To fit a vibrator reverse the procedure, taking care to align the black marks on the clamp and the vibrator shell before pushing into the socket. Do not on any account force the vibrator into the wrong holes, as serious damage will result.

7. Fuse Replacement:—

A short circuit in the connections in the vibrator unit or the sender-receiver unit will melt the fuse. If the vibrator is faulty in certain ways it also will melt a fuse, but the trouble is unlikely and is easily checked by putting in a vibrator known to be good and checking for a short circuit again. A spare fuse is carried in dummy clips alongside the working fuse. The various possible causes of a fuse failure should be checked carefully before putting in the spare, so that the trouble may be rectified without melting any more fuses.

8. B.F.O. Adjustment:—

It is possible that after a long time the B.F.O. will require re-alignment, and this is effected very simply after the back of the S/R Unit case is removed. A steady carrier, preferably on the low frequency end of the dial and from a similar set, is tuned in carefully to give maximum output of noise or modulation in the headphones. The SPEECH-C.W. switch is then placed at C.W. and the adjusting screw

of L.12 is adjusted until "zero-beat" is obtained between the B.F.O. signal and the carrier. Variation either side of the receiver tuning control, once zero is obtained, should produce a musical note in the headphones of equal strength for similar pitch. If the B.F.O. is set off zero-beat, one side of the beat-note range will be much stronger than the other, and thus may interfere with reception of a signal on an adjacent channel or allow interference by such a signal.

CHAPTER III

Section 5—TEST SPECIFICATION

1. Dummy Aerial Load:—

The Aerial, Dummy, is provided as a vocabulary item. It consists of six 100 ohm. 2 watt resistors in parallel, and the whole connected in series with a 10-150 uuF. variable condenser. The condenser is calibrated for four positions, namely, 30, 50, 75 and 150 uuF. When this circuit is connected across the AERIAL and EARTH terminals, the condenser settings correspond with the following standard aerials:—

30 uuF. is equal to 6 feet plain vertical rod.

50 uuF. is equal to 9 feet plain vertical rod.

75 uuF. is equal to 9 feet vertical rod with spreaders.

150 uuF. is equal to 15 feet vertical rod with spreaders.

2. Sender:—

Using the dummy aerial, adjusted to 50 uuF. (and maximum screen volts with Mark I senders), the following aerial currents should be obtained:—

| Freq.—Mc/s | R.F. Current—mA |
|------------|-----------------|
| 4.3 | 215 |
| 5.5 | 220 |
| 6.7 | 225 |

Under modulation conditions, i.e., with SPEECH-C.W. control at SPEECH, 18 volts additional negative bias is applied to the P.A. grids.

This increased bias is necessary for proper grid modulation, and the aerial current is thereby reduced by one-third from the C.W. value. 100 per cent. modulation will cause the aerial current to rise by approximately 23 per cent. on this new value. Proper operating conditions in the modulation circuit may be checked by injecting the output of the Beat-frequency Oscillator, adjusted to 400 cycles per second into the microphone circuit by means of a microphone plug connected to the 300 ohm. output terminals of the Oscillator and plugged into the microphone jack of the sender. By using the output control of the oscillator with this connection, it should be possible to cause the aerial current to increase by the necessary 23 per cent. to indicate 100 per cent. modulation.

LIEUT. P. M. EDWARDS

When speaking into the microphone, in the normal connection, the aerial current will rise only 5 per cent. to 10 per cent., owing to the average modulation level on speech being considerably less than 100 per cent.

The function of the valves, looking at the front of the sender and reading from left to right is: V1 (1K5G) Master Oscillator, V2 (1K5G) and V3 (1K5G), the two paralleled power-amplifier valves.

Socket Analysis:—

Analysers tests should be made with the sender in the send condition, two sets of readings being taken, namely—

- (a) SPEECH condition.
- (b) C.W. condition.

LIEUT. P. M. EDWARDS

MASTER OSCILLATOR, V1, 1K5G

| | VOLTS | | | | | MILLIAMPERES | | | |
|-----------------------|-------|-----|-----|-----|-----|--------------|-----|-----|-----|
| Socket Terminal . . . | 2 | 3 | 4 | 7 | Cap | 2 | 3 | 4 | Cap |
| Measurement . . . | Ef+ | Ep | Esg | Ef— | Eg— | If | Ip | Isg | Ig |
| SPEECH | 3.8 | 210 | 210 | 1.9 | 0 | 255 | 8 | 8.1 | 0 |
| C.W. | 3.8 | 197 | 197 | 1.9 | 0 | 250 | 7.3 | 2.5 | 0 |

POWER AMPLIFIER (EACH VALVE), V2 or V3

| | VOLTS | | | | | MILLIAMPERES | | | |
|-----------------------|-------|-----|-----|-----|-------|--------------|------|-----|-----|
| Socket Terminal . . . | 2 | 3 | 4 | 7 | Cap | 2 | 3 | 4 | Cap |
| Measurement . . . | Ef+ | Ep | Esg | Ef— | Eg— | If— | Ip | Isg | Ig |
| SPEECH | 1.9 | 210 | 117 | 0 | —18 | | | | |
| C.W. | 1.9 | 190 | 93 | 0 | —14.5 | | 4.25 | 1.5 | |

All voltage measurements are taken with reference to frame.

All readings are independent of frequency.

3. Receiver:—

The function of the valves, looking at the front of the receiver and reading from left to right, is: V5 (1C7G), Beat-frequency Oscillator; V3 (1K7G), 2nd Detector; V2 (1K5G), Intermediate Frequency Amplifier; V1 (1C7G), Frequency Converter; V4 (1K7G), Audio Frequency Amplifier.

Socket Analysis—

The following figures should be approximately the same for C.W. and SPEECH conditions, except in the case of the I.F. and Converter valves, where the different readings are shown. VOLUME CONTROL at maximum in all cases.

BEAT FREQUENCY OSCILLATOR: V5 1C7G

| | VOLTS | | | | | | MILLIAMPERES | | | | | |
|-------------------------|-------|----|---------------------|-----|-------------|------|--------------|-----|-----|-----|-----|-----|
| | 2 | 3 | 4 | 5 | 6 | 7 | 2 | 3 | 4 | 5 | 6 | 6 |
| Socket Terminal | Ef + | Ep | Esg C.W. only | Eog | Eop only | Ef - | Cap Eg | If | Ip | Isg | Iop | Iop |
| Measurement | 5.8 | 92 | 12 | 3.2 | 107 | 3.95 | 4V + | 127 | 7.5 | .67 | 1 | .31 |
| Reading | | | | | | | | | | | | |

DETECTOR AND REFLEX AMPLIFIER V3 1K7G

| | VOLTS | | | | | | MILLIAMPERES | | | | | |
|-------------------------|-------|----|-----|-----|-----------|------|--------------|-----|------|-----|-----|------|
| | 2 | 3 | 4 | 5 | 6 | 7 | 2 | 3 | 4 | 5 | 6 | 6 |
| Socket Terminal | Ef - | Ep | Ed1 | Ed2 | Esg 72 | Ef - | Cap Egl | If | Ip | Isg | Iop | Iop |
| Measurement | 4 | 93 | 0 | 0.3 | 72 | 2 | 0 | 130 | 0.75 | 0 | 3 | 0.27 |
| Reading | | | | | | | | | | | | |

I.F. AMPLIFIER V2 1K5G

| | VOLTS | | | | | | MILLIAMPERES | | | | | |
|-------------------------|-------|-----|-----|-----|-----|------|--------------|-----|-----|-----|-----|-----|
| | 2 | 3 | 4 | 5 | 6 | 7 | 2 | 3 | 4 | 5 | 6 | 6 |
| Socket Terminal | Ef + | Ep | Esg | Eog | Eop | Ef - | Cap Eg | If | Ip | Isg | Iop | Iop |
| Measurement | 2 | 142 | 72 | 52 | 0 | 0 | 1.5 | 130 | 1.4 | 1.9 | .5 | .6 |
| SPEECH | 2 | 139 | 52 | 0 | 0 | 0 | 0 | 130 | 1.9 | 1.9 | .5 | .6 |
| C.W. | 2 | 139 | 52 | 0 | 0 | 0 | 0 | 130 | 1.9 | 1.9 | .5 | .6 |

FREQUENCY CONVERTER V1 1C7G

| | VOLTS | | | | | | MILLIAMPERES | | | | | |
|-------------------------|-------|-----|-----|-----|-----|------|--------------|-----|-----|-----|-----|-----|
| | 2 | 3 | 4 | 5 | 6 | 7 | 2 | 3 | 4 | 5 | 6 | 6 |
| Socket Terminal | Ef + | Ep | Esg | Eog | Eop | Ef - | Cap Eg | If | Ip | Isg | Iop | Iop |
| Measurement | 1.9 | 140 | 90 | 0 | 95 | 0 | 0 | 130 | 2.7 | 1.2 | 0 | 2.3 |
| SPEECH | 1.9 | 140 | 90 | 0 | 95 | 0 | 0 | 130 | 2.6 | 1.2 | 0 | 2.2 |
| C.W. | 1.9 | 140 | 90 | 0 | 95 | 0 | 0 | 130 | 2.6 | 1.2 | 0 | 2.2 |

A.F. AMPLIFIER V4 1K7G

| | VOLTS | | | | | | MILLIAMPERES | | | | | |
|-------------------------|-------|-----|-----|-----|-----|------|--------------|-----|-----|-----|-----|-----|
| | 2 | 3 | 4 | 5 | 6 | 7 | 2 | 3 | 4 | 5 | 6 | 6 |
| Socket Terminal | Ef + | Ep | Esg | Eog | Eop | Ef - | Cap Eg | If | Ip | Isg | Iop | Iop |
| Measurement | 5.9 | 142 | 142 | 142 | 142 | 4 | 0 | 127 | 2.2 | 2.2 | .97 | .97 |
| Reading | | | | | | | | | | | | |

4. Alignment:—

The Intermediate Frequency is 460 Kc/s. The oscillator portion of the frequency converter, V1, operates at a frequency 460 Kc/s higher than the signal circuit.

The alignment procedure is as follows:—

- (a) Connect Dummy Aerial, set at 50 μ F. across AERIAL and EARTH terminals.
- (b) Connect active wire of 300 ohm. output of Signal Generator to V1 cap, leaving normal clip in position; connect shield of signal feeder to EARTH.
- (c) Short-circuit terminal 5 (oscillator grid) of V1 to frame.
- (d) Adjust output of Signal Generator to 460 Kc/s.
- (e) Connect Output-Meter to headphone jack by temporary headphone plug.
- (f) Adjust set to RECEIVE; turn on power to Signal Generator.
- (g) Adjust output control of Signal Generator and VOLUME control of set to cause half-scale deflection on Output-Meter.
- (h) The I.F. transformers should now be adjusted to cause maximum deflections of the output-meter. This adjustment is made by means of the adjusting screws on the top of each transformer case. The sequence of adjustment will be L9-L10, L7-L8.
- (i) Having peaked the I.F. transformers, remove short-circuit from oscillator grid and connect the shielded wire from the Signal Generator direct to AERIAL terminal of Receiver.
- (j) Adjust frequency of Signal Generator and receiver to 6.7 Mc/s.
- (k) Adjust AERIAL TUNE of Receiver to 30.
- (l) By means of the trimmer condenser, C5, adjust for maximum reading on output meter, making small adjustments simultaneously to AERIAL TUNE condenser C3. If C3 has to be moved appreciably from a dial setting of 30, adjustment of L1-L2 inductance should be made by means of its movable core. It may be necessary also to adjust the inductance of L3-L4 in a similar manner if peaking cannot be obtained by adjustment of C5.
- (m) Check calibration of C2 dial in a similar manner at 4.3 Mc/s, making new adjustments of L1-L2 and L3-L4 inductances as necessary.
- (n) Recheck calibration of C2 dial at 6.7 Mc/s, and 4.3 Mc/s alternately, the object being to obtain adjustments which give the least error at each end of the dial.

The following readings were taken to check the action of A.V.C. at different signal strengths. These figures were obtained by connecting the meter directly in the socket leads.

Actual Readings at Valve Base

I.F. AMPLIFIER 1K5G V2

| Generator Ratio | Attenuator | I _p | I _{sg} |
|-----------------|------------|----------------|-----------------|
| DIRECT | Zero | 1.7 mA | .5 mA |
| | 100° | 1.7 mA | .5 mA |
| X 10 | 50° | 1.4 mA | .5 mA |
| | 100° | 1.15 mA | .5 mA |
| X 100 | 50° | .8 mA | .4 mA |
| | 100° | .65 mA | .3 mA |
| X 1000 | 50° | .5 mA | .2 mA |
| | 100° | .35 mA | .1 mA |

FREQUENCY CONVERTER 1C7G V1

| Generator Ratio | Attenuator | I _p | I _{sg} | I _{op} |
|-----------------|------------|----------------|-----------------|-----------------|
| DIRECT | Zero | 1.5 mA | 1.4 mA | 2.8 mA |
| | 100° | 1.5 mA | 1.5 mA | 2.8 mA |
| X 10 | 50° | 1.0 mA | 1.5 mA | 2.8 mA |
| | 100° | .8 mA | 1.5 mA | 2.9 mA |
| X 100 | 50° | .45 mA | 1.5 mA | 3.1 mA |
| | 100° | .34 mA | 1.5 mA | 3.2 mA |
| X 1000 | 50° | .28 mA | 1.5 mA | 3.25 mA |
| | 100° | .22 mA | 1.5 mA | 3.3 mA |

Sensitivity Readings—

Connect Signal Generator with modulated signal to AERIAL and EARTH terminals with dummy aerial in parallel, and set at 50 uuF. Connect Output Meter to headphone output. Adjust receiver to SPEECH with VOLUME at maximum.

| SIGNAL GENERATOR | | OUTPUT METER |
|------------------|------------|--------------|
| Ratio | Attenuator | db. |
| DIRECT | 10 | +5.0 |
| | 20 | +15.0 |
| | 30 | +15.5 |
| | 40 | |
| | 50 | |
| | 60 | |
| | 70 | Constant |
| | 80 | at +15.5 |
| | 90 | |
| | 100 | |

5. Vibrator Unit:—

Voltage Divider Mark 1

Taps on voltage divider should be adjusted to the following approximate values and, under various loadings, the stated voltages should be obtained, all values being referred to the negative terminal and taken direct off the voltage divider.

| VOLTS | | | | | | | | | | | | | | | | | | |
|--|-----|------|----------------|------|------|------|------|------|------|-------|-----------------|---|---|---|---|--|---|--|
| Voltage Divider Tapping Ohms. | OFF | REC. | SPEECH | | | | SEND | | | | C.W. (KEY DOWN) | | | | | | | |
| | | | Screen Tap No. | | | | | | | | Screen Tap No. | | | | | | | |
| | | | 1 | | 2 | | 3 | | 4 | | 1 | | 2 | | 3 | | 4 | |
| | | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | | | | |
| 160 | 4.7 | 7.7 | 8.4 | 8.5 | 8.75 | 9 | 9.5 | 9.7 | 10.5 | 10.55 | | | | | | | | |
| 760 | 10 | 13.5 | 19.8 | 20.2 | 21 | 21.5 | 23.5 | 24.5 | 25.5 | 26.5 | | | | | | | | |
| 9000 | 103 | 81 | 93.5 | 93.5 | 93.5 | 93.5 | 87 | 88 | 90 | 90 | | | | | | | | |
| 10500 | 117 | 90 | 106 | 104 | 105 | 105 | 102 | 98 | 100 | 100 | | | | | | | | |
| 12250 | 140 | 106 | 128 | 126 | 123 | 122 | 122 | 120 | 112 | 114 | | | | | | | | |
| 133800 | 152 | 118 | 142 | 140 | 136 | 133 | 136 | 133 | 127 | 124 | | | | | | | | |
| 200000 | 205 | 153 | 193 | 191 | 189 | 188 | 187 | 185 | 182 | 180 | | | | | | | | |
| 250000 | 260 | 245 | 238 | 238 | 237 | 237 | 236 | 235 | 234 | 232 | | | | | | | | |

Voltage Divider Mark II

Taps on voltage divider are fixed at junctions of R4, R6, R5 and R3.

| Voltage Divider Tapping Ohms. | VOLTS | | | |
|--|-------|------|------|-----------------------|
| | OFF | REC. | SEND | |
| | | | SP. | C.W. (key down) |
| 800 | 8 V | 15 | 20 | 23 |
| 15000 | 150 | 120 | 130 | 115 |
| 20500 | 205 | 160 | 187 | 180 |
| 25000 | 250 | 242 | 237 | 232 |

Note that on Mark II vibrator units the negative and +12-v. terminals on the terminal strip are tied, and therefore 18 volts negative bias is available across the sensitivity control R16 in the receiver. On Mark I power units this bias is 6v.

Note that all above voltages are measured with the Service Analyser and will be different if a voltmeter of lower resistance is used.

(See opposite page)

REMARKS.

- (a) Normally carried in Bag, Aerial Gear No. 2.
- (b) One carried in set, one in Case, valve and receiver, two in Satchels, signal.
- (c) Fitted in Batteries, 6-volt, 25 Ah. Boxes.
- (d) Carried in set.
- (e) Carried in Case, valve and receiver.
- (f) Will only be issued when set mounted in Vans, wireless.
- (g) Carried in Vibrator Unit No. 101.
- (h) Normal issue is 2: 4 will be issued to Batteries, R.A.A. only.
- (i) Used with Wireless Remote Control Units, A.
- (k) Fitted in Wireless Remote Control Units, A.
- (l) One carried in set, one in Satchels, signal.
- (m) For use on Receivers, headgear, double.

APPENDIX I

Wireless Sets No. 101, Complete Stations List.

| Designation | Essential for Work | Essential Spares | Total | Remarks |
|---|-----------------------|---------------------|-------|---------|
| Section F | | | | |
| Brushes, sash tool, No. 2 | 1 | | 1 | (a) |
| Hammers, ball pane, 12-oz. | 1 | | 1 | (a) |
| Section W.2 | | | | |
| Cells, dry, X Mk. II | 4 | | 4 | (k) |
| Section Y | | | | |
| Receivers, headgear, double (S.T.C.), L.R. | 4 | | 4 | (b) |
| Section Z | | | | |
| Antennae, Rod, "A"— | | | | |
| Pegs | 3 | 1 | 4 | (a) |
| Peg Bags | 1 | | 1 | (a) |
| Reamers | 1 | | 1 | (a) |
| Stay Plates | 1 | | 1 | (a) |
| Stay Plates, Special (N.I.V.) | 1 | | 1 | (a) |
| Bags, aerial gear, No. 2 | 1 | | 1 | |
| Batteries, Secy., Port., 6-volt, 25 Ah Boxes | 1 | 2 | 3 | |
| Cases, Valve and Receiver | 1 | | 1 | |
| Cells, Secy., Port., 2-volt, 25 Ah | 3 | 6 | 9 | (c) |
| Connectors, Twin, No. 13 | 4 | | 4 | (h) |
| Twin, No. 16 | 2 | | 2 | (i) |
| Plug, No. 1, Mk. II | 2 | | 2 | (i) |
| Keys, W.T., 8 amp., No. 2 | 1 | | 1 | (d) |
| Leads, Counterpoise, No. 1 | 2 | | 2 | (a) |
| Microphones, Hand, No. 3 | 2 | | 2 | (l) |
| Plugs, Single, No. 9 | 4 | | 4 | (m) |
| Satchels, Signal | 2 | | 2 | (i) |
| Valves, W.T.— | | | | |
| Type 1K5G | 4(d) | 2(e) | 6 | |
| Type 1C7G | 2(d) | 1(e) | 3 | |
| Type 1K7G | 2(d) | 1(e) | 3 | |
| Watches, non-magnetic | 1 | | 1 | (d) |
| Wireless Sets, No. 101 (N.I.V.) | 1 | | 1 | |
| Aerial bases, flexible | 1 | | 1 | (f) |
| Aerial bases, with spike | 1 | | 1 | (a) |
| Aerials, flexible, jointed | 1 | | 1 | (f) |
| Clamps, spoke, mast | 1 | | 1 | (a) |
| Connectors, twin, No. 11A | 2 | | 2 | (a) |
| Connectors, twin, No. 12A | 1 | | 1 | (f) |
| Connectors, 6 point, No. 1A | 1 | | 1 | (a) |
| Connectors, 6 point, No. 2A | 1 | | 1 | (f) |
| Leads, aerial | 1 | | 1 | (a) |
| Mast Sections | 3 | 2 | 5 | (a) |
| Spokes, mast | 4 | 1 | 5 | (a) |
| Vibrator Units, No. 101 | 1 | | 1 | |
| Vibrators, 6 volt, V5211 | | 1 | 1 | (g) |
| Wireless Remote Control Units, "A" | 2 | | 2 | |
| Section M.T.13 | | | | |
| Cabinets, Wireless, L.P., No. 3 | 1 | | 1 | (f) |
| Stationery | | | | |
| SIGNAL TRAINING, Vol. III, Australian Pamphlet No. 3 | | 1 | 1 | |

(See opposite page)

APPENDIX II

Wireless Sets, No. 101, Mk. I and Mk. 11

NOTE.—The "Provisional Nos." in the first column are those appearing in the Provisional Handbook as "Item Nos." and on the tags of spares provisioned as "Cat. Nos." It is important that both the Prov. Nos. and Vocab. Cat. Nos. be quoted when demanding spares.

A. CIRCUIT COMPONENTS, as shown on Schematic Diagrams.

1. SENDER.

| Prov. No. | Vocab. Cat. No. | Designation | Description | Circuit Reference |
|-----------|-----------------|---------------------------------------|--|-------------------|
| 72 | ZAP.301 | Condenser, semi-fixed, No. 2 | M.O. calibrating | C1 |
| 73 | ZAP.315 | Condenser, variable, No. 1 | 11 plate, M.O. tuning | C2 |
| 74 | ZAP.280 | Condenser, fixed, R, 1, C, AP | .001 mica, A.W.A., M.O. tuning and aerial coupling | C3, C13 |
| 75 | ZAP.200 | Condenser, semi-fixed, No. 1 | M.O. trimmer. | C4 |
| 76 | ZAP.213 | Condenser, fixed, Y, 5, B, AP | 1 uF., metal cased, bypass | C5, C10 |
| 77 | ZAP.235 | Condenser, fixed, Q, 1, C, AP | .01 uF., A.W.A., R.F. bypass | C6 |
| 78 | ZAP.228 | Condenser, fixed, X, 5, AP | 500 uF. mica, SM, M.O. grid | C7, C9, C11, C12 |
| 79 | ZAP.256 | Condenser, variable, No. 2 | Aerial tuning, Mk. II equipments only | C14 |
| 80 | ZAP.316 | Condenser, semi-fixed, No. 3 | Neutralising, Mk. II equipments only | C15 |
| 81 | ZAP.302 | Resistor, No. 2, 3 watt, 8.4 ohms. | I.R.C., AA, filaments series feed | R1 |
| 82 | ZAP.640 | Resistor, No. 2, 3 watt, 16.6 ohms. | I.R.C., AA, filaments, parallel feed | R2 |
| 83 | ZAP.667 | Resistor, No. 3, 1 watt, 20,000 ohms. | I.R.C., BT1, M.O. grid | R3 |
| 84 | ZAP.641 | Resistor, No. 3, 1 watt, 25,000 ohms. | I.R.C., BT1, P.A. grids, KEY | R4 |
| 85 | ZAP.668 | Resistor, No. 2, 3 watt, 20 ohms. | I.R.C., AA, microphone series feed | R5 |
| 86 | ZAP.642 | Resistor, No. 3, 1 watt, 40,000 ohms. | I.R.C., BT1, P.A. grids, SPEECH | R6 |
| 87 | ZAP.670 | Inductance, No. 1, AP | M.O. coil | L1 |
| 88 | ZAP.450 | Inductance, No. 2, AP | Aerial coil | L2, L3 |
| 89 | ZAP.460 | Choke, R.F., No. 1, AP | R.F.C. | L4 |
| 90 | ZAP.185 | Transformer, microphone, C, AP | Microphone input, 1TW5613 | T1 |
| 91 | ZAP.812 | Ammeter, R.F., 300 mA., AP | Palec, aerial current meter | M1 |
| 92 | ZAP.070 | Switch, 3 pole, 4 way, AP | SEND-OFF-REC-NET | S1 |
| 93 | ZAP.772 | Switch, 3 pole, 2 way, AP | SPEECH-KEY | S2 |
| 94 | ZAP.758 | Valve, W/T, 1K5G | AERIAL-TAP | S3 |
| 95 | ZAP.754 | Valve, W/T, 1K5G | M.O. and P.A. | V1, V2, V3 |
| 96 | ZAP.906 | Key, W/T, 8 amp. | Sending key, C.W. | KEY |

2. RECEIVER.

| Prov. No. | Vocab. Cat. No. | Designation | Description | Circuit Reference |
|-----------|-----------------|--|---|----------------------------|
| 175 | ZAP-223 | Condenser, fixed, P, 1, C, AP | 1 uF., paper, tubular, bypass | C1, C7, C11, C12, C18, C28 |
| 176 | ZAP-317 | Condenser, variable, No. 3 | 2 gang, 7 plate, tuning | C2 |
| 177 | ZAP-318 | Condenser, variable, No. 4 | 19 plate, TUNE REC AERIAL | C3 |
| 178 | ZAP-287 | Condenser, fixed, X, 2, AP | 200 uF., mica, SM | C4, C15, C17, C22, C27 |
| 179 | ZAP-303 | Condenser, semi-fixed, No. 4 | Oscillator trimmer | C5 |
| 180 | ZAP-281 | Condenser, fixed, X, 9, AP | 900 uF., mica, A.W.A. | C6, C23, C25, C30 |
| 184 | ZAP-220 | Condenser, fixed, P, 25, AP | .25 uF., paper, tubular, bypass | C10, C21, C26 |
| 190 | ZAP-229 | Condenser, fixed, Q, 1, D, AP | .01 uF., paper, tubular, coupling | C16, C24 |
| 203 | ZAP-253 | Condenser, fixed, R, 2, AP | .002 uF., mica, SM | C29 |
| 211 | ZAP-675 | Resistor, 1 watt, 100,000 ohms. | I.R.C., BT1, A.V.C. line, V1 and I.F.T. suppressors | R1, R5, R13, R7 |
| 212 | ZAP-671 | Resistor, No. 3, 1 watt, 50,000 ohms. | I.R.C., BT1, Osc. grid leak, V1 and B.O., grid leak | R2, R18 |
| 213 | ZAP-657 | Resistor, No. 3, 2 watt, 75,000 ohms. | I.R.C., BT2, screen feed, V1 and plate feed, V3 | R3, R14 |
| 214 | ZAP-659 | Resistor, No. 3, 2 watt, 150,000 ohms. | I.R.C., BT2, screen feed, V2 | R4 |
| 216 | ZAP-682 | Resistor, No. 3, 1 watt, 2 megohms | I.R.C., BT1 | R6, R9, R19 |
| 218 | ZAP-678 | Resistor, No. 3, 1 watt, 300,000 ohms. | I.R.C., BT1, R.F. stopper | R8 |
| 220 | ZAP-666 | Resistor, No. 3, 2 watt, 250,000 ohms. | I.R.C., BT2, screen feed, V3 | R10 |
| 221 | ZAP-680 | Resistor, No. 3, 1 watt, 1 megohm | I.R.C., BT1, A.V.C. line | R11 |
| 222 | ZAP-603 | Resistance, variable, .5 megohm | Yaxley, volume control | R12 |
| 225 | ZAP-679 | Resistor, No. 3, 1 watt, 500,000 ohms. | I.R.C., BT1, grid, V4 | R15 |
| 226 | ZAP-600 | Resistance, variable, 500 ohms. | A.W.A., C.W. bias, ganged with R12 | R16 |
| 227 | ZAP-641 | Resistor, No. 2, 3 watt, 16.5 ohms. | I.R.C., AA, filament series feed | R17 |
| 230 | ZAP-653 | Resistor, No. 3, 2 watt, 100,000 ohms. | I.R.C., BT2, B.F.O. plate feed | R20 |
| 231 | ZAP-654 | Resistor, No. 3, 2 watt, 200,000 ohms. | I.R.C., BT2, Osc. plate feed, V1 | R21 |
| 205 | ZAP-465 | Inductance, No. 3, AP | Aerial coil assembly | L1-L2 |
| 206 | ZAP-475 | Inductance, No. 4, AP | Oscillator assembly | L3-L4 |
| 207 | ZAP-301 | Transformer, I.F., A, AP | Intermediate transformers, Nos. 1 and 2 | L5-L6 |
| 208 | ZAP-302 | Transformer, I.F., B, AP | Intermediate transformer, No. 3 | L7-L8 |
| 210 | ZAP-480 | Inductance, No. 18, AP | B.F.O. coil assembly | L8-L9 |
| 209 | ZAP-156 | Choke, R.F., No. 2, AP | B.F.O. choke | L12 |
| 232 | ZAP-818 | Transformer, telephone, D, AP | Output to 'phones, ITG3155 | L11 |
| 233 | ZAP-765 | Switch, 2 pole, 2 way, AP | SPEECH—C.W. | T1 |
| 235 | ZAP-906 | Valve, W/T, 1K5G | Intermediate amplifier | S1 |
| 236 | ZAP-907 | Valve, W/T, 1K7G | Reflexed detector and output | V2 |
| 237 | ZAP-904 | Valve, W/T, 1C7G | Oscillator mixer and B.F.O. | V3, V4, V1, V5 |

Appendix II—(Continued)

5. RECEIVER PANEL ASSEMBLIES.

| Panel A | | | Panel B | | Panel C | | Panel D | |
|-----------|-----------------|--------------------------------------|--|--|-------------------|--|---------|--|
| Prov. No. | Vocab. Cat. No. | Designation | Description | | Circuit Reference | | | |
| 298 | ZAP-230 | Condenser, fixed, Q, 1, E, AP | .01 uF., paper, wax dipped, bypass | | C1, C2, C3 | | | |
| 299 | ZAP-225 | Condenser, fixed, Q, 2, A, AP | 2 x .02 uF., paper suppressors | | C4, C5 | | | |
| 300 | ZAP-201 | Condenser, fixed, 500, A, AP | 2 x 500 uF., electrolytic, paralleled | | C6, C7 | | | |
| 301 | ZAP-202 | Condenser, fixed, 2/8, AP | 2 x 8 uF., electrolytic, filter | | C8, C9 | | | |
| 302 | ZAP-229 | Condenser, fixed, Q, 1, D, AP | .01 uF., paper, tubular, R.F. bypass | | C10 | | | |
| 303 | ZAP-617 | Resistor, No. 3, 2 watt, 100 ohms. | I.R.C., BT2, suppressors | | R1, R2 | | | |
| 304 | ZAP-617 | Resistor, No. 2, 30 watt, 5000 ohms. | I.R.C., DJA, 2 clips | | R3 | | | |
| 305 | ZAP-617 | Resistor, No. 2, 30 watt, 5000 ohms. | I.R.C., DJA, 2 clips | | R4 | | | |
| 306 | ZAP-618 | Resistor, No. 2, 30 watt, 7500 ohms. | I.R.C., DJA, 1 clip | | R5 | | | |
| 307 | ZAP-621 | Resistor, No. 2, 30 watt, 7500 ohms. | I.R.C., DJA, 2 clip | | R6 | | | |
| 308 | ZAP-622 | Resistor, No. 2, 12 watt, 4500 ohms. | I.R.C., DJ | | R7 | | | |
| 309 | ZAP-487 | Resistor, No. 2, 12 watt, 800 ohms. | I.R.C., DJ | | R8 | | | |
| 310 | ZAP-488 | Resistor, No. 2, 12 watt, 5500 ohms. | I.R.C., DJ | | R9 | | | |
| 311 | ZAP-171 | Choke, R.F., No. 3, AP | R.F. choke | | R10 | | | |
| 312 | ZAP-170 | Choke, A.F., No. 1, AP | R.F. choke | | R11 | | | |
| 313 | ZAP-950 | Transformer, Vibrator, A, AP | Power transformer, 1TJ5318 | | R12 | | | |
| 314 | ZAP-753 | Switch, 2 pole, ON-OFF, AP | Filter choke, 2TJ5620 | | R13 | | | |
| 315 | ZAP-753 | Switch, 1 pole, 4 way, AP | Filter choke, 2TJ5227 | | R14 | | | |
| 316 | ZAP-753 | Switch, 1 pole, 4 way, AP | Oak, synchronous | | R15 | | | |
| 317 | ZAP-753 | Switch, 1 pole, 4 way, AP | 2 poles paralleled | | R16 | | | |
| 318 | ZAP-753 | Switch, 1 pole, 4 way, AP | Screen tapplings, Mk I equipments only | | R17 | | | |

1. SENDER-RECEIVER UNIT. B. CASE AND CHASSIS PARTS

| Prov. No. | Vocab. Cat. No. | Designation | Description | No. per Eqp't. | | |
|-----------|-----------------|---------------------------|--|----------------|-------|------|
| | | | | Sudt. | Rcvr. | Case |
| 47 | ZAP-050 | Catch, ball | For valve inspection lid | 1 | 1 | 1 |
| 243 | ZAP-051 | Catch, left hand | For case lid, also Vibrator case | | | 1 |
| 243 | ZAP-052 | Catch, right hand | For case lid, also Vibrator case | | | 1 |
| 37 | ZAP-053 | Contact, spring clip | For microphone socket | 1 | 1 | |
| 131 | ZAP-054 | Coverplate, I.F. | Access to I.F. adjustments | | | |
| 69D | ZAP-055 | Dial plate, TUNE AER. | For C14 | 1 | | |
| 165 | ZAP-057 | Dial plate, TUNE REC. AER | For C3 | | | |
| 170D | ZAP-058 | Grid Connectors, bush | For C2, C2 | | | |
| 45 | ZAP-059 | Grid Connectors, collar | Through panel connector, with grid lead | 3 | 1 | |
| 43 | ZAP-060 | Grid Connectors, collar | Ebonite, through panel, and for key lead | 4 | 5 | |
| 44 | ZAP-061 | Grid clips | Ebonite, back of panel, and for key lead | 4 | 5 | |
| 46 | ZAP-062 | Grommets, valve mounting | For valve caps | 3 | 5 | |
| 51 | ZAP-063 | Jack assembly, phones | Live rubber for valve socket plates | 6 | 10 | |
| 132 | ZAP-064 | Jack assembly, contacts | For two L.R. phones | | | |
| 138 | ZAP-065 | Key, W/T, cord assembly | Pair shielded leads, with terminations | 1 | 1 | |
| 104 | ZAP-066 | Knob, arrow | For 1-in. shaft, operating S2, S1 | | 2 | |
| 69 | ZAP-067 | Knob, tuning | REC. AER (Mk. I. equipments only). For 1-in. shaft, for M.O., TUNE AER. | 2 | 1 | |
| 166 | ZAP-068 | Knob, lock | TUNE REC. dials; and for TUNE REC. AER. (Mk. II equipments only) | 2 | 2 | |
| 170C | ZAP-069 | Knob, lock | For locking spindles, and for slow motion drive, M.O. dial | 3 | 2 | |
| 69A | ZAP-080 | Knob, AERIAL TAP | Thumb lever, operating S3 | 1 | 1 | |
| 64F | ZAP-081 | Locking spindle, long | For M.O. dial, with knob | 1 | | |
| 167 | ZAP-082 | Locking spindle, short | For TUNE AER., TUNE REC. AER., TUNE REC. with knob | 1 | | |
| 39 | ZAP-083 | Meter cover assembly | Cover, dust pad, window and clips | 1 | | |
| 40 | ZAP-084 | Meter window | | 1 | | |
| 41 | ZAP-085 | Meter window, clips | | 1 | | |
| 42 | ZAP-086 | Meter dust pad | | 1 | | |
| 17 | ZAP-087 | Plug, terminal | Rubber, Mk. II. equipments only | 1 | | |
| 16 | ZAP-088 | Plug, terminal | For sender-receiver connections | 10 | 4 | |
| 130 | ZAP-089 | Plug panel, 10 way | Ebonite, for 10 plugs, terminal | 1 | | |
| | | Plug panel, 4 way | Ebonite for 4 plugs, terminal | 1 | | |

Appendix II—Sender-Receiver Unit—(Continued).

| Prov. No | Vocab. Cat. No. | Designation | Description | No. per Eqp't. | |
|-------------|--------------------|---|-------------------------------------|----------------|------------|
| | | | | Sndr. | Rcvr. Case |
| 64A | ZAP-090 | Pointer, red | For M.O. dial | 1 | |
| 64B | ZAP-091 | Pointer, white | For M.O. dial | 1 | |
| 83 | ZAP-092 | Pointer, line | For TUNE AERIAL and TUNE REC. | 1 | 1 |
| 86 | ZAP-093 | Rubber dust band | Dustproofing gear drive, C2 | 1 | |
| 174A | ZAP-094 | Rubber driving band | Ganging R16 and R12 | 1 | 1 |
| 174B | ZAP-095 | Rubber driving band, jockey spring | Tensioning rubber band | 1 | 1 |
| 65A | ZAP-096 | Rubber collar | For slow motion drive, M.O. dial | 1 | |
| 65 | ZAP-097 | Slow motion drive | Carrying plate, with knob assembled | 1 | |
| 249A | ZAP-098 | Socket, 10 pin | For sender connections | | |
| 251A | ZAP-099 | Socket, 4 pin | For receiver connections | | |
| 265 | ZAP-100 | Socket, connector twin, male | With 2 pins for L.T. connections | 1 | 1 |
| 270 | ZAP-101 | Socket, cover | Metal cover for 2-pin socket | 1 | 1 |
| 279 | ZAP-102 | Socket, bush | Insulating positive terminal | 1 | 1 |
| 281 | ZAP-103 | Socket, connector, 6-point, block | Ebonite, carrying 6 prs. blades | 1 | 6 |
| 283 | ZAP-104 | Socket, connector, 6-point, packer | Spacing blades | | 6 |
| 284 | ZAP-105 | Socket, connector, 6-point, main | | | 6 |
| | ZAP-106 | contact blade | | | |
| 262 | ZAP-107 | Socket, connector, 6-point, bent | | | 6 |
| | ZAP-108 | contact blade | | | 1 |
| 269 | ZAP-109 | Socket cover | | | 1 |
| 279 | ZAP-110 | Socket bush | Metal, protecting socket | | 6 |
| 103 | ZAP-111 | Socket, valve | Insulating terminals | | |
| 168 | ZAP-112 | Split pin | Octal, assembled to plate | 3 | 5 |
| 239 | ZAP-113 | Strap, carrying, Set | For dial locking bars | 2 | 2 |
| 240 | ZAP-114 | Strap, carrying, strip | Leather, 18g-in. long | | 1 |
| 241 | ZAP-115 | Strap, carrying, spacer | Securing strap | | 2 |
| 18 | ZAP-116 | Tag, soldering | Mounting strip | 25 | 22 |
| 31 | ZAP-117 | Terminals, aerial and earth—front screw | For wiring | 2 | 1 |
| 22 | ZAP-118 | Terminals, aerial and earth—nut, black | | 1 | 1 |
| 23 | ZAP-119 | Terminals, aerial and earth—nut, red | | 1 | 1 |
| 24 | ZAP-120 | Terminals, aerial and earth—spring | | 1 | 1 |

| Prov. No. | Vocab. Cat. No. | Designation | Description | No. per Equip. | | |
|-----------|-----------------|----------------------------------|--|----------------|------|------|
| | | | | Snbr. | Rev. | Case |
| 19 | ZAP.121 | Terminals, aerial and earth—bush | Front and back of panel | 2 | 1 | |
| 170A | ZAP.122 | Thumb wheel | For worm drive, TUNE REC. | | | |
| 64 | ZAP.123 | Tuning assembly, M.O. | With C3, C3, C4, L1, terminal panel and dial gears | 1 | | |
| 69 | ZAP.124 | Tuning assembly, TUNE AERIAL | With C18, C14, L4 and S3 | 1 | | |
| 170 | ZAP.125 | Tuning assembly, TUNE REC. | With 2 gang, C2, C3, and worm drive | 1 | | |
| 155 | ZAP.126 | Watch case | For watches, non-magnetic | 1 | | |
| 156 | ZAP.127 | Watch case, Hd | | 1 | | |

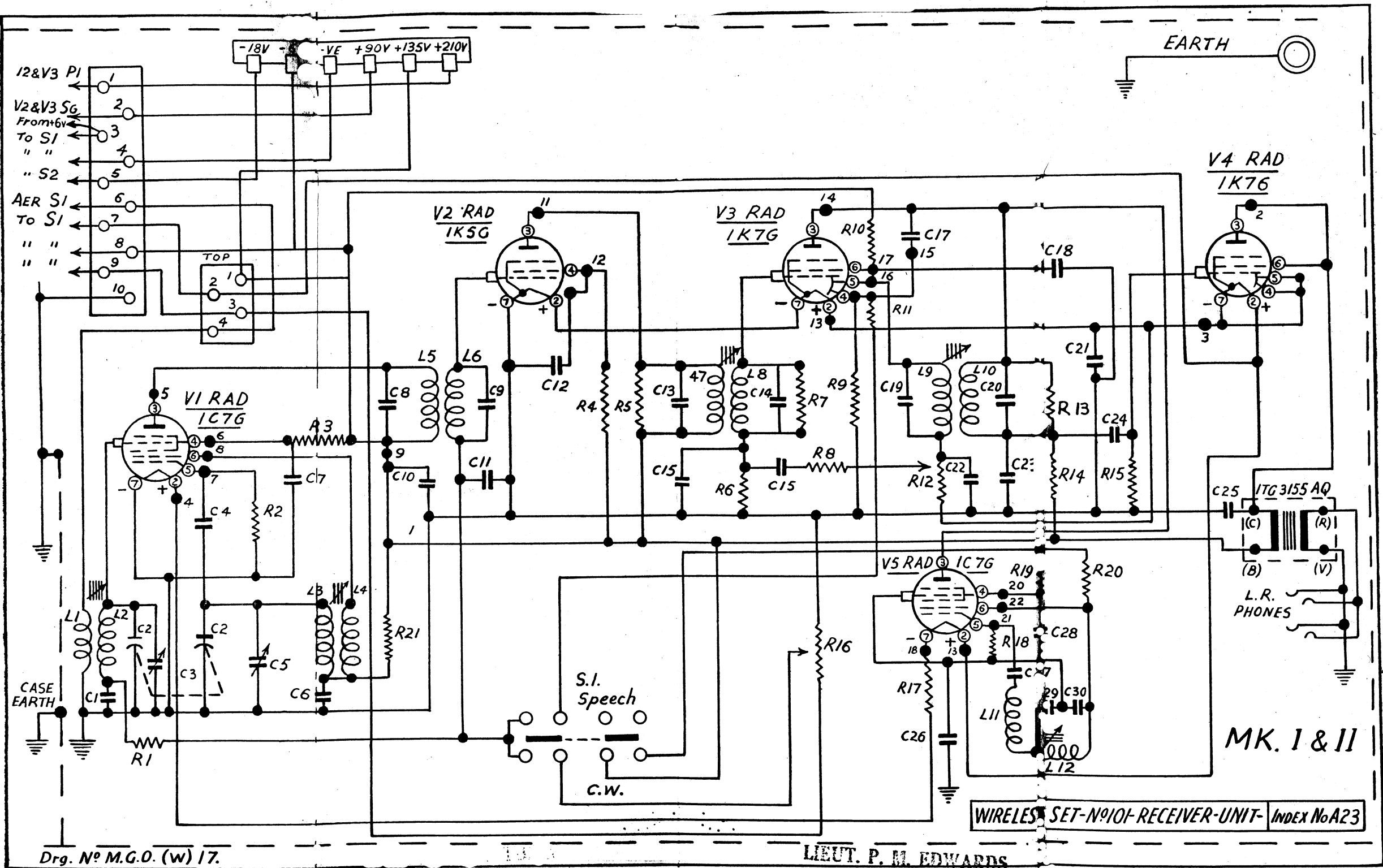
2. CONNECTORS.

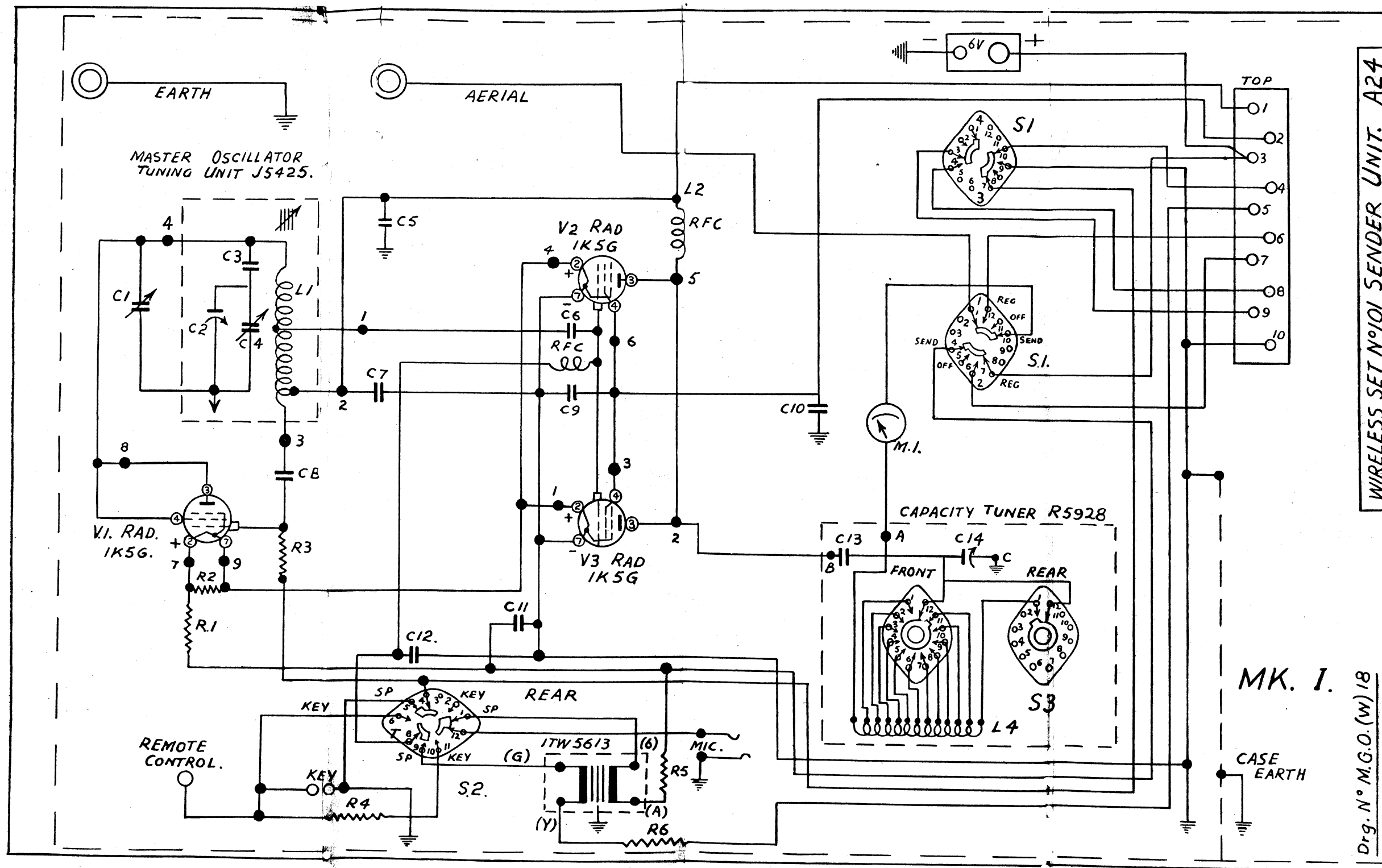
| Prov. No. | Vocab. Cat. No. | Designation | Description | No. per Equip. | |
|-----------|-----------------|-------------------------------------|--|----------------|--|
| | | | | | |
| 358 | ZAP.128 | Connector, twin, No. 11A | Set to vibrator unit, vibrator unit to battery | 2 | |
| 359A | ZAP.129 | Connector, twin, plug cover block | | 2 | |
| 360 | ZAP.130 | Connector, twin, No. 12A | | 2 | |
| — | ZAP.131 | Connector, twin, No. 12A | Used in Cabinets, wireless | 1 | |
| — | ZAP.132 | Connector, twin, No. 12A, Cable | 6ft. long | 1 | |
| 363 | ZAP.133 | Connector, twin, nut | Slotted for key | 8 | |
| 364 | ZAP.134 | Connector, twin, rubber tube | | 4 | |
| 365A | ZAP.135 | Connector, twin, socket assembly | | 2 | |
| 366 | ZAP.136 | Connector, twin, socket cover block | | 2 | |
| — | ZAP.137 | Connector, 6-point, No. 1A | | 1 | |
| — | ZAP.138 | Connector, 6-point, No. 1A, Cable | | 1 | |
| 369 | ZAP.139 | Connector, twin, cable | Used in Cabinets, wireless | 2 | |
| 349 | ZAP.140 | Connector, 6-point, No. 1A | 6ft. long | 1 | |
| 360 | ZAP.141 | Connector, 6-point, block | 2ft. 8in., cable, 2-way | 1 | |
| 351 | ZAP.142 | Connector, 6-point, cover block | Set to vibrator unit | 2 | |
| 352 | ZAP.143 | Connector, 6-point, packer | | 1 | |
| 353 | ZAP.144 | Connector, 6-point, contact | | 2 | |
| 354 | ZAP.145 | Connector, 6-point, bent plate | Main and bent plates, with terminals | 2 | |
| 355 | ZAP.146 | Connector, 6-point, main plate | | 6 | |
| 356 | ZAP.147 | Connector, 6-point, plug contact | | 6 | |
| 357 | ZAP.148 | Connector, 6-point, cable | 3ft. 6in., cable, 6-way | 6 | |
| | | | | 1 | |

Appendix II—(Continued).

3. VIBRATOR UNIT.

| Prov. No. | Vocab. Cat. No. | Designation | Description. | No. per Equip. |
|-----------|-----------------|------------------------------------|--------------------------------------|----------------|
| 820A | ZAP.149 | Catches, lid | See ZAP.051, ZAP.052 | 1 |
| 845 | ZAP.161 | Cover, canvas | Protecting sockets, with clamp strip | 5 |
| 347 | ZAP.152 | Cover, clamp strip, rivet 9/32 in. | Black oxidised | 2 |
| 386 | ZAP.153 | Fuse, 15 amp. | 1 working, 1 spare | 1 |
| 322 | ZAP.154 | Knob, metal | With pin lever, operating S1 | 1 |
| 326 | ZAP.155 | Socket, 2-pin, male | Ebonite carrying 2 pins | 1 |
| 330 | ZAP.156 | Socket, 2-pin, cover | Socket carrying 2 sockets | 2 |
| 331 | ZAP.157 | Socket, 2-pin, cover | Socket carrying 2-pin sockets | 2 |
| 332 | ZAP.158 | Socket, 2-pin, bush | Socket carrying 2-pin sockets | 2 |
| 334 | ZAP.159 | Socket, 2-pin, block | See ZAP.105 | 1 |
| 288A | ZAP.160 | Socket, 6-pin, contact | See ZAP.106 | 6 |
| 314 | ZAP.161 | Socket, 6-pin, bush | 7-pin, for V5211 | 1 |
| 316 | ZAP.162 | Strap, carrying | Leather, 24½ in. long | 1 |
| 489D | ZAP.163 | Strap, carrying, brackets | Securing strap to case | 2 |
| 297A | ZAP.164 | Tag, spade | For terminal strip connections | 10 |
| | | Washers, cork, 1/16 in. | Mounting V.D. resistors | 8 |

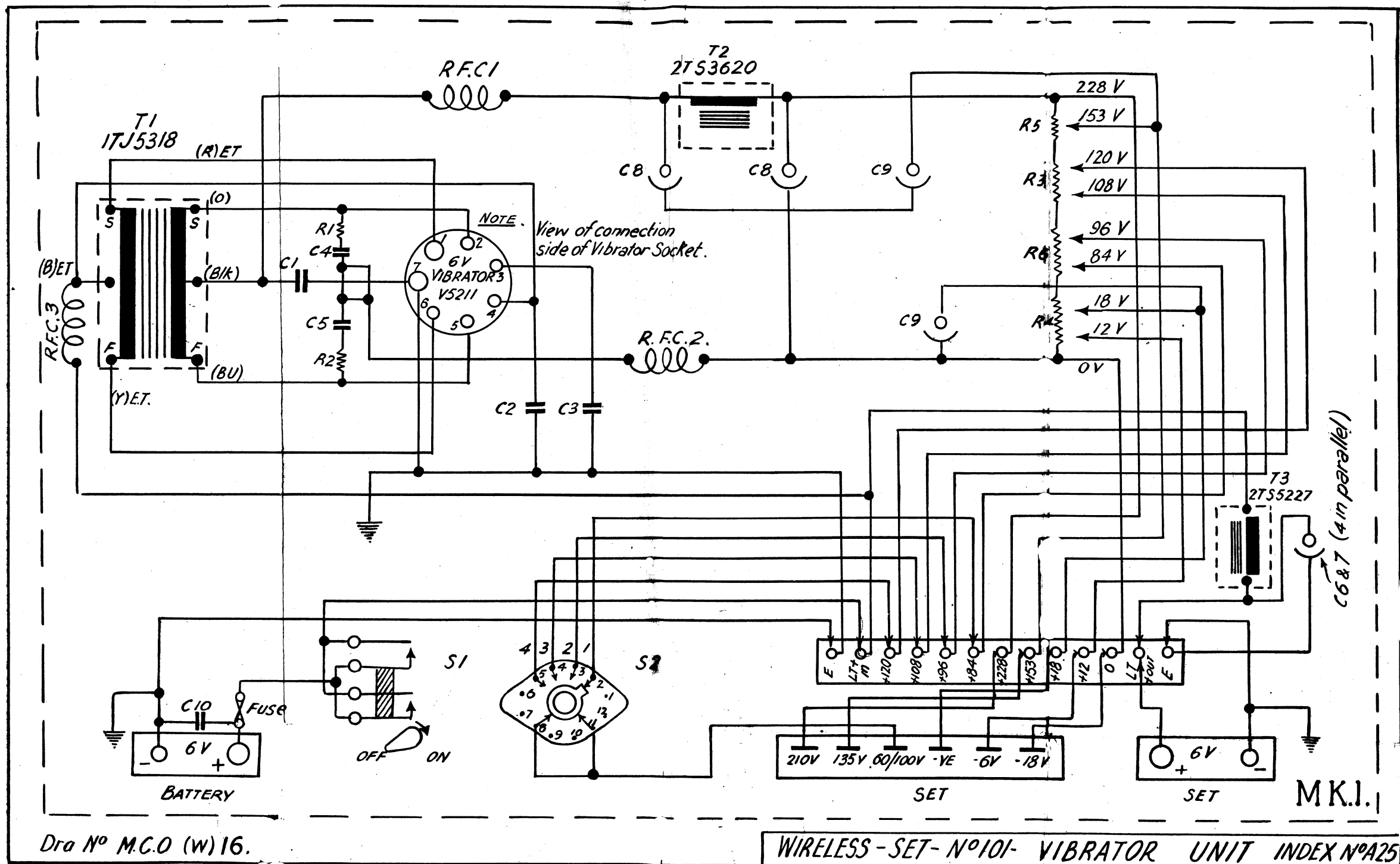




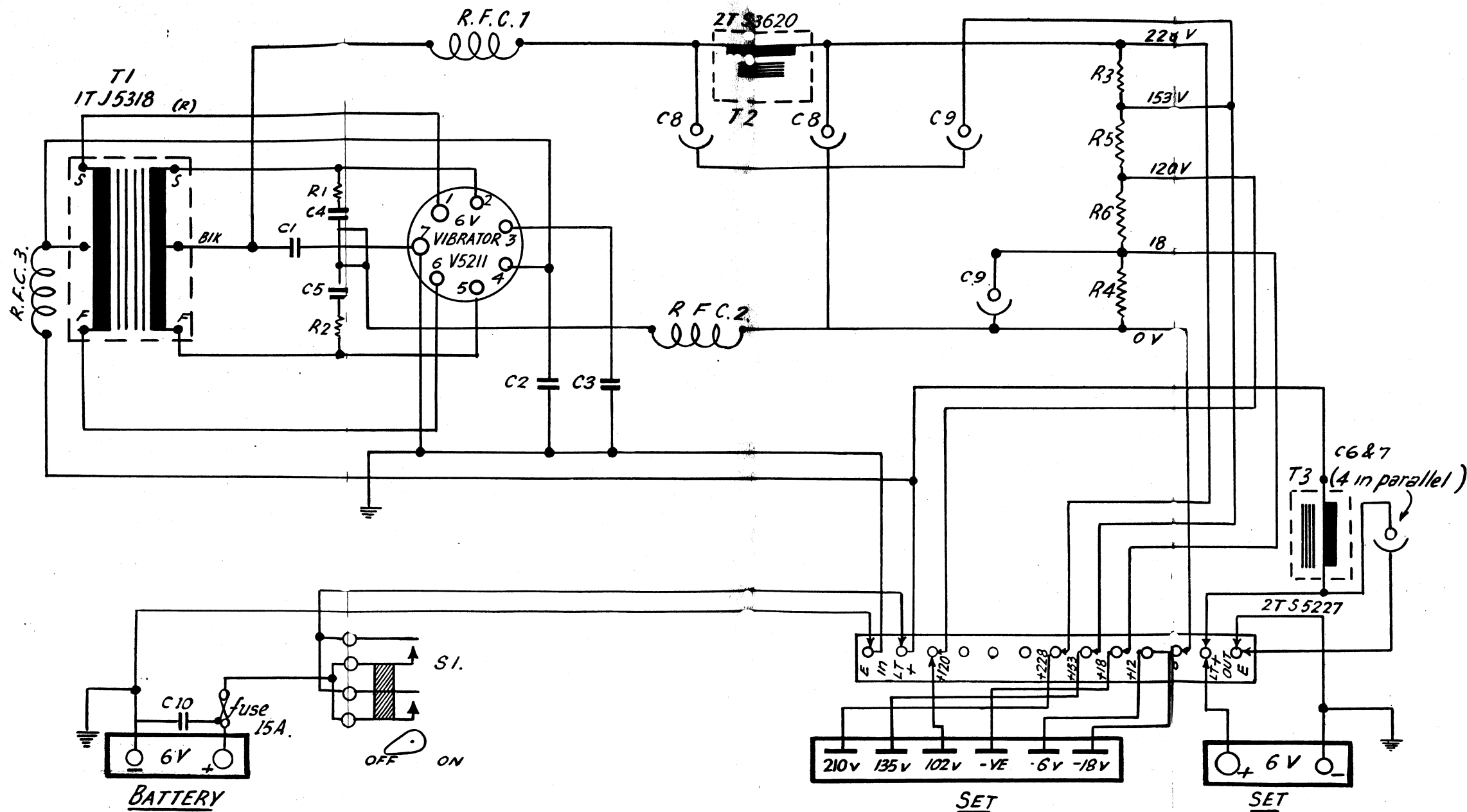
WIRELESS SET N°101 SENDER UNIT. A24

MK. I.

Org. N° M.G.O. (W) 18



Dra N° M.C.O (W) 16.



Applies to Serial Nos. Over 50 —

MK.II. *M.*

WIRELESS SET No 101. VIBRATOR UNIT

INDEX No A. 25/1