

OPERATING AND INSTALLATION INSTRUCTIONS
(Preliminary Copy)

WIRELESS SET, CANADIAN, NO. 9 MK. I.

VEHICLE AND GROUND STATION.

GENERAL DESCRIPTION

1.1 General

Wireless Set, Canadian, No. 9 Mk. I Vehicle and Ground Station comprises a sender, receiver, supply unit and all the accessory equipment which is required to operate the Wireless Set either in a vehicle or as a ground station.

The Wireless Set is intended to perform the same function in Signals communication that has been fulfilled by Wireless Set (Canadian) No. 9.

The principal features of W/S, Canadian, No. 9 Mk. I are the following:

General

- (a) Pressel operation of send/receive function.
- (b) Remote operation of R/T, W/T, and send/receive switching on R/T.
- (c) Greater ruggedness and stability.

Receiver.

- (a) Built-in crystal calibrator with markers at 1000 kc., 100 kc., 10 kc.
- (b) Increased audio output from the receiver.
- (c) Loudspeaker.

Sender.

- (a) Simplified Aerial Tuning.
- (b) Increased power output.
- (c) No delay from receive to send.

1.2 The Wireless Station is supplied in ten kits. These kits are listed below. The contents are shown on the enclosed Station List. Kits 6 and 7 are identical and kits 5 and 10 are identical.

<u>No.</u>	<u>Kit</u>
1	Set Kit
2	Operating Kit
3	Remote Control and Ground Station Kit
4	Vertical Aerial Kit
5	Battery Kit No. 1
6	Charging Kit No. 1
7	Charging Kit No. 2
8	Remote Receiver Kit
9	Tent Kit
10	Battery Kit No. 2

All of the kits are not required for most installations. Much less trouble will be caused if the other kits are not opened.

When the Wireless Set is used in a vehicle, kits 1, 2, 5 and 6, are required.

When a Ground Station is required use kits 1, 2, 3, 4, 5, 6, 9. Kit 7 may be added if necessary.

When a remote receiver is required use kits 8 and 10. Kit 7 may be added if the receiver will be used for long periods.

Nuts and bolts are supplied with the carrier and with the aerial base C-1. Since the equipment is self-contained no additional installation kit is required.

- 1.3 Whip aeriels are provided. These rods have the same dimensions as the rods which are used with Wireless Set No. 19 and are mutually interchangeable with them. Adaptors, V, Laport are provided.

The possible arrangements of these rods are listed below in the order in which the radiation from the aerial increases.

6'
8'V
12'
12'V
16'
16'V

Note: The 8'V and 12' are approximately equal in radiation.
The 12'V and 16' are approximately equal in radiation.

Any of these aeriels may be used when the vehicle is stationary.
The 16' aerial is recommended.

On the move any of the single aeriels, 8', 12', 16' or the 8'V, may be used. When the V arrangement is used on a moving vehicle not more than 8' of rod should be used. The 8'V is recommended for mobile operation.

Chapter 2

INSTALLATION INSTRUCTIONS

- 2.1 To establish a W/S No. 9 Mark I in a vehicle.

(Kits No. 1, 2, 5, 6, are required)

- (a) Fill the four batteries with acid and then complete the charging process according to the instructions on the inside of the battery cover. This will require two days which should be sufficient time to get the Wireless Set into the vehicle.
- (b) Do not attach the Aerial Tuning Coil to the Wireless Set until the Set has been installed in the vehicle.

If clamps are not provided for the Wireless Set it will be necessary to remove the Set and carrier from the cradle and then bolt the cradle to the table. Nuts and bolts are provided. To remove the Set and carrier from the cradle, remove the nuts and bolts which join the shock mounts to the carrier. Be sure to replace the end of each pigtail when the Wireless Set is replaced.

- (c) The aerial base C-1 should be mounted on the centre or right hand side of the vehicle roof, near the bulkhead. Of these, the centre is the better location. An extension is provided for those vehicles which are fitted with a chimney to provide a base plate for the aerial base.

The tension of the spring should be adjusted so that the spring is completely compressed when the aerial is turned through about 90 degrees from the vertical.

- (d) If the aerial base is mounted at the centre of the roof, fasten the aerial tuning coil No. 2 to the ~~top~~ of the Wireless Set.

If the aerial base is mounted at the right hand side of the roof fasten the aerial tuning coil No. 2 to the side of the Wireless Set.

- (e) Aerial Lead assembly, C-1 is used to connect the large terminal socket on the tuning coil to the aerial base. Cut the lead to the correct length and solder on the lug which is provided with the lead. The lead should have just sufficient slack to prevent strain when the equipment moves on its shock-mounts.

- (f) Connect Leads, Earth, C-1 from the vehicle ground terminal to the nearer of the two ground posts which are provided on the cradle of the Wireless Set.

- (g) Unless the vehicle wiring includes battery jumpers, connectors, single, No. C3 should be used to connect each pair of batteries in series. Connectors, twin, No. 17 are used to connect the Wireless Set to the 12V terminals on the vehicle. Connect the red lead to the positive terminal and the black lead to the negative terminal.

- (h) Mount the Johnson Chore-Horse charger in its compartment and connect it to the vehicle charging panel. An instruction booklet for this charger is available in the charger tool box.

The Wireless Set is now ready for operation according to the instructions in Chapter III.

2.2 To establish a Wireless Set, Canadian, No. 9 Mk. I Ground Station.

(Kits No. 1, 2, 3, 4, 5, 6, 9, are required.)

- (a) Fill the four batteries with acid and then complete the charging process according to the instructions on the inside of the battery cover.
- (b) Erect the wireless tent. Choose, if possible, a flat patch of ground and remember that a spike for the vertical aerial, and pegs for the tent must be driven into the ground. A table strong enough to support the Wireless Set is required. The tables which are supplied in wireless vehicles are suitable and are removable. Place the table so that the wireless set will be parallel to the flaps at one end. Floor boards will make the tent more comfortable.

- (c) Place the wireless set on the table. Handles have been provided on the two ends of the carrier. Place the four batteries and the switchboard underneath the table. Turn all the knobs on the switchboard to the "OFF" position.

Mount the coil, aerial, tuning, No. 2 on the Wireless Set and connect the lead from the coil to the Set.

- (d) Join the exhaust pipe to the charging unit and put it outside and away from the tent where the exhaust fumes can do no harm.

Attach one end of connectors, twin No. 53 to the terminals of the charging unit. Connect the red lead to the (+) positive terminal and connect the black lead to the (-) negative terminal.

Attach the other end of connectors, Single No. 53 to the two terminals on the switchboard marked "CHARGER NO. 1". Connect the red lead to the (+) positive terminal and the black lead to the (-) negative terminal.

- (e) Attach the four connectors, Single No. 23 to the two pairs of terminals on the Switchboard marked "BATT. NO. 1" and "BATT. NO. 2".

Separate the four batteries into two pairs. One pair is "BATT. NO. 1", the other pair is "BATT. NO. 2". Connect the two "Batteries No. 1" in series with a "Connectors, Single, No. 3". Connect the two "Batteries No. 2" in series with the other "Connectors, Single, No. 3".

Join the two leads from the "BATT. NO. 1" terminals of the Switchboard to the terminals of "BATT. NO. 1".

Join the two leads from the "BATT. NO. 2" terminals of the Switchboard to the terminals of "BATT. NO. 2".

Be careful to join the lead from the (+) positive terminal of the Switchboard to the (+) positive terminal of the battery and the lead from the (-) negative terminal of the Switchboard to the (-) negative terminal of the battery in each case.

Tighten with pliers all the connections on the Switchboard.

- (f) Attach the lugs of connectors, Twin, No. 17 to the "12V OUTPUT" terminals of the Switchboard. Connect the red lead to the (+) terminal and the black lead to the (-) negative terminal.

Attach the socket of connectors, Twin, No. 17 to the "12 VOLTS" plugs on the Wireless Set and tighten the bolt.

- (g) Erect the Vertical Aerial close to the end of the tent at which the Wireless Set has been placed. An instruction Booklet is included in the Bags, Aerial Gear.

Join Lead, Aerial, No. 5 to the Vertical Aerial and to the Aerial Tuning Coil No. 2.

Connect one Leads, Counterpoise, No. 2 Mk. III to each of the ground terminals on the carrier. Spread these out to cover as large an area as possible.

- (h) Turn the "12 VOLT OUTPUT FROM" to either of the ON positions, say to "BATT. NO. 1".
- (i) To charge battery No. 2 turn the "BATTERY NO. 2 ON CHARGE FROM" switch to "CHARGER NO. 1".
- (j) To float charge from one pair of batteries say No. 2, set the knobs as for (i) then turn the "12 VOLT OUTPUT FROM" switch to the "BATT. NO. 2" position.

Chapter 3

OPERATING INSTRUCTIONS.

3.1 Preliminary

- (a) Check all the connections to the battery, aerial and ground terminals. See Chapter 2.
- (b) Join a Microphone and Headgear Assemblies, No. 1 to one of the drop cords on the Supply Unit.
- (c) Turn the "SEND-RECEIVE" switch to RECEIVE and the "NET" switch to "OFF". Turn the "ON-OFF" switch to "ON".

3.2 Receiver

The Controls

- (a) The "TUNING CONTROL", the "SLOW MOTION" control, the "C.V.-R.T." switch, the "H.F. GAIN" control, the "OUTPUT" control and the "SELECTIVITY" switch, should be operated in the same manner as on Wireless Set, Canadian, No. 9.

Before using the Set, check the BATT., H.T.1, H.T.2, and BIAS voltages on the meter. These should be approximately 12V., 150V, 200V, 100V. H.T.1 voltage can be read only when the receiver is "ON" and H.T.2 and bias voltages can only be read when the sender is "ON".

Sidetone can be heard in the headphones at all times whether the speaker is being used or not.

- (b) The Crystal Calibrator

The crystal calibrator provides a signal every 1000 kc, 100 kc, or 10 kc, according to the switch position.

The frequencies from the calibrator are of crystal accuracy and can be used to set the frequency of both the receiver and the sender.

To Set the Receiver Frequency by the Crystal Calibrator.

e.g. to set the receiver frequency to 4.43 mc.

- (i) Turn the "FREQUENCY CHECK" switch to 100, the mode of operation switch to "C.W. AUTO", the "SELECTIVITY" switch to SHARP, the "HET. TONE" to the centre mark and the "OUTPUT" control fully clockwise.
- (ii) Turn the "TUNING CONTROL" until either the "A" or the "B" flick is engaged.
- (iii) Loosen the locking bar under the "TUNING CONTROL" cap and then turn this control to about 4.4 mc. Near this position an audio note will be heard. When this note has been found turn the "SLOW MOTION" dial to about -20 and tighten the flick lock on the "TUNING CONTROL".
- (iv) Using the "SLOW MOTION" dial turn to the zero beat of the audio note. The receiver is now tuned to 4.4 mc.
- (v) Turn the "FREQUENCY CHECK" knob to 10. Turn the "SLOW MOTION" dial toward zero. As it is turned a series of audio notes will be heard.

Count the number of audio zero beats which are heard and stop at the third. Adjust the "SLOW MOTION" dial until the set is tuned exactly to zero beat. The receiver is now tuned to 4.43 mc.

If the frequency had been 4.46 mc the "TUNING CONTROL" would have been turned to about 5 mc. The "SLOW MOTION" dial would then have been turned to about +30 before locking the flick bar. The "SLOW MOTION" dial would then be turned toward zero until the fourth note would have been reached.

At the low frequency end of the dial the tuning is sufficiently slow that the "SLOW MOTION" dial need not be used to find the correct beat note. It is left at zero until the correct audio note has been reached with the "TUNING CONTROL". The lock is then tightened and the receiver is tuned to zero beat with the "SLOW MOTION" dial.

- (vi) Turn the "FREQUENCY CHECK" knob to "OFF". If any station interferes during the process described above, remove the lead which connects the Coil, Aerial Tuning No. 2 to the sender. If the zero beat setting is broad reduce the "H.F. GAIN" setting.

3.3 The Sender

(a) General

The Wireless Set will usually be operated from a Microphone and Receivers Headgear Assembly No. 1 which is plugged into the drop cord on the Supply Unit. On R.T. send-receive switching is performed by merely squeezing the microphone pressel switch. On M.C. and C.W. it is more convenient to use the switch on the Supply Unit. "PHONES" jacks on the receiver and a "MIC" jack on the sender have been provided to enable operation with Receivers, Headgear, M.C., Canadian and Microphone Hand, No.3.

When the Wireless Set is operated from a Wireless Remote Control Unit, No. 1 (Canadian), the send-receive switch on the Remote Unit is used.

(b) The "MASTER OSCILLATOR".

The "MASTER OSCILLATOR" is tuned by netting it to the receiver. The receiver must have been previously tuned to another station or to the crystal calibrator.

- (i) Set the sender switch to R.T., the "SEND-RECEIVE" switch to "RECEIVE", the "NET" switch to "NET", the mode of operation switch to "C.W. AUTO", the "OUTPUT" control fully clockwise, the "H.F. GAIN" control as far counter clockwise as possible, and turn the "CHANNEL SWITCH" to the channel which is being used on the receiver.
- (ii) Loosen the "LOCK" and turn the "MASTER OSCILLATOR" control to approximately the desired frequency. An audio note will be heard. Tune the "MASTER OSCILLATOR" to the zero beat of this heterodyne note and then tighten the "LOCK". Turn the "NET" switch to "OFF".
- (iii) The "MASTER OSCILLATOR" should be re-netted after the "P.A. TUNING" has been properly adjusted.

(c) The "P.A. TUNING".

This should be done on HIGH power. The "HIGH-LOW" switch is located in the lower right hand compartment of the sender. The output tuning should be done on M.C.W.

- (i) Turn both the Coil, Aerial Tuning, and the "P.A. TUNING" controls to approximately zero. Turn the sender switch to M.C.W., the "SEND-RECEIVE" switch to "SEND" and put a key plug into the "KEY" jack. Strap the key so that it is held closed.
- (ii) Turn the COIL, AERIAL TUNING to a higher setting until a reading is obtained on the "AERIAL METER". Tune the coil for maximum meter deflection. Notice this meter reading. Now detune the coil slightly and retune the "P.A. TUNING" for the greatest meter deflection. If this deflection is smaller than the original maximum turn the coil back until it is slightly detuned on the other side of the maximum. Make successive adjustments of the coil and condenser in this direction until the greatest meter deflection has been located.
- (iii) Tighten the lock on the "P.A. TUNING" control with a screwdriver or coin. Tighten the "LOCK" on the "COIL, AERIAL, TUNING" by hand. Check the netting of the "MASTER OSCILLATOR".

Set the "SEND-RECEIVE" switch to "RECEIVE" and the sender switch to R.T., M.C.W., or C.W., as desired.

NOTES

- (i) If the Wireless Set is tuned when the vehicle is stationary, it will be necessary to readjust the Coil, Aerial Tuning slightly, when the vehicle is on the move or if the location is changed.
- (ii) When the 34 ft. vertical aerial is used above about 3.6 mc it will be necessary to shorten the aerial.
- (iii) Operate the charger for sufficiently long periods to keep the batteries fully charged.
- (iv) When the sender is being used frequently the batteries which are being used should be charged. This is called "float-charging". Adjust the rate of charge until the voltage at the Wireless Set is about 12V on "Send". See par (j) P.5.

Chapter 4

THE REMOTE RECEIVER

4.1 DESCRIPTION

With every Wireless Set No. 9 Mark I Station, a Remote Receiver, a Supply Unit, and Batteries are included. The receiver is identically the same as the receiver which forms part of the Wireless Set No. 9 Mark I, with the single exception that the case is fitted with carrying handles.

This receiver can be established wherever a listening post is required. It can be placed, for example, beside a Remote Control Unit which is connected to a Wireless Set No. 9, Mark I. Under this condition with the Wireless Set at "SEND", on C.W., or M.C.F., it can be keyed from the Remote Control Unit. The other sender will be received on the Remote Receiver and break-in operation is available.

To provide power for the receiver, a battery kit and a vibrator Supply Unit are included. The Supply Unit is packed with spare vibrator, fuses, valves, with an aerial and with receiver headgear, in an operating box which accompanies the Remote Receiver. The Supply Unit, ZEll, can be operated from a 12V battery or from an A.C. line which provides either 110V or 230V 60 or 25 cycle.

4.2 INSTALLATION

- (a) Kit 8 is required for A.C. operation.
- (b) Kits 8 and 10 are required for 12V D.C. operation.
Kit 7 may be added if the receiver will be used for long periods.

(A) CONNECTIONS

The Receiver and Supply Unit are joined by Connectors, Plug, No. 1. The small plug should be attached to the Supply Unit. The connector block should be attached to the upper, rear, right-hand corner of the Receiver. Secure the connector with the long knurled head screw.

- (i) D.C. Turn the "ON-OFF" switch "OFF".

The line cord which is under the Supply Unit cover should be plugged into the socket on the chassis and the removable plug should be in the "D.C." socket. Replace the cover.

Join the two lug ends of Leads, Battery, No.1, to the terminals on the Supply Unit and tighten them with pliers. Connect two batteries in series with Connectors, Single No.C3. Only two Batteries are required for operation. The other two may be put on charge while one pair is being used. Attach the battery clips to the remaining positive and negative terminals of the battery. Be sure that the positive battery terminal is connected to the +12V terminal on the Supply Unit and that the negative terminal is connected to the -12V terminal on the Supply Unit.

The current drain of the Receiver and Supply Unit is low so that float charging is unnecessary. Two pairs of batteries have been provided so that one pair can be charged while the other pair is in use.

- (ii) A.C. Turn the "ON-OFF" switch "OFF".

Put the removable plug into the "AC" socket. Find out what the line voltage is and set the toggle switch to that voltage. Do not connect the Supply Unit to a D.C. line. Be sure to replace the switch clamp. Plug the line cord into the AC outlet.

- (B) AERIAL AND GROUND.

A length of aerial wire and six insulators have been provided. Use the insulators to attach the wire to two trees or poles. Connect the end of the aerial to the terminal marked AE on the side of the Receiver connector block. A ground lead should be used if possible. Connect this to the Receiver at the knurled bolt on the back of the connector block using a clip or twisting the wire tightly with pliers.

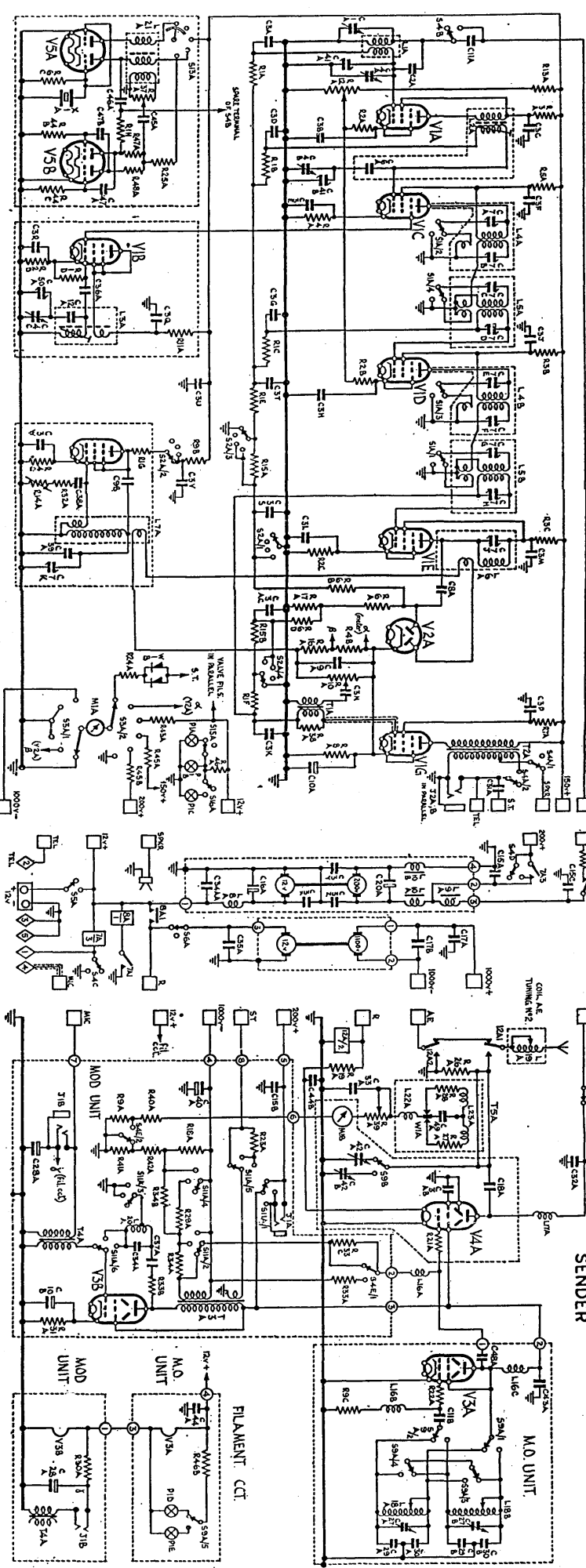
4.3. OPERATION.

Turn the "ON-OFF" switch on the Supply Unit to "ON". Plug a Receiver, headgear M.C., Canadian, into the Receiver jack and turn the "SPEAKER-PHONES" switch to "PHONES".

Further operating procedure is the same as for the receiver which is part of the Wireless Set.

Two 10 amp. fuses are included in the Supply Unit. One of these is under the cover. Spares are included in the operating box.

RECEIVER



PLUGS & SOCKETS		RECEIVER		P.S.U.		SENDER		VALVES		CONDENSERS		RESISTANCES		INDUCTANCES		JACKS		CRYSTAL		METERS		LAMPS	
<p>POINTS OF SOCKETS CONNECTING RECEIVER P.S.U. & SENDER TO PLUGS ON CABINET. PLUGS ARE SHOWN VIEWED FROM THE FRONT.</p> <p>RECEIVER, P.L.1A</p> <p>SENDER, P.L.4A</p>		<p>54A/1-4 SELECTIVITY CONTROL</p> <p>54A/1-2 SYSTEM</p> <p>54A/1-2 METER SWITCH</p>		<p>54C REC</p> <p>54D ONT</p> <p>54E ONT</p>		<p>54A/2 OUTPUT</p> <p>54A/2 CONTROL</p> <p>54A/2 ANTENNA</p>		<p>V1 6X4</p> <p>V2 6AR5 (AOD)</p> <p>V3 6AV6</p> <p>V4 6AV6</p>		<p>C1 20µF 50V</p> <p>C2 20µF 50V</p> <p>C3 20µF 50V</p> <p>C4 20µF 50V</p> <p>C5 20µF 50V</p> <p>C6 20µF 50V</p> <p>C7 20µF 50V</p> <p>C8 20µF 50V</p> <p>C9 20µF 50V</p> <p>C10 20µF 50V</p>		<p>R1 100K</p> <p>R2 100K</p> <p>R3 100K</p> <p>R4 100K</p> <p>R5 100K</p> <p>R6 100K</p> <p>R7 100K</p> <p>R8 100K</p> <p>R9 100K</p> <p>R10 100K</p>		<p>L1 27mH</p> <p>L2 27mH</p> <p>L3 27mH</p> <p>L4 27mH</p> <p>L5 27mH</p> <p>L6 27mH</p> <p>L7 27mH</p> <p>L8 27mH</p> <p>L9 27mH</p> <p>L10 27mH</p>		<p>J1 MIC</p> <p>J2 MIC</p> <p>J3 MIC</p> <p>J4 MIC</p> <p>J5 MIC</p> <p>J6 MIC</p> <p>J7 MIC</p> <p>J8 MIC</p> <p>J9 MIC</p> <p>J10 MIC</p>		<p>CR1 2M</p> <p>CR2 2M</p> <p>CR3 2M</p> <p>CR4 2M</p> <p>CR5 2M</p> <p>CR6 2M</p> <p>CR7 2M</p> <p>CR8 2M</p> <p>CR9 2M</p> <p>CR10 2M</p>		<p>M1 50µA D.C.</p>		<p>L1 250V 100W</p> <p>L2 250V 100W</p> <p>L3 250V 100W</p> <p>L4 250V 100W</p> <p>L5 250V 100W</p> <p>L6 250V 100W</p> <p>L7 250V 100W</p> <p>L8 250V 100W</p> <p>L9 250V 100W</p> <p>L10 250V 100W</p>	

W. S. CANADIAN No. 9

E11169

54A/1-2 SPK/PHONE

54A/1-2 METER SWITCH

54A/1-2 ANTENNA

54A/1-2 CONTROL

54A/1-2 ANTENNA

54A/1-2 CONTROL

54A/1-2 ANTENNA

54A/1-2 CONTROL

54A/1-2 ANTENNA

54A/1-2 CONTROL

54A/1-2 ANTENNA

