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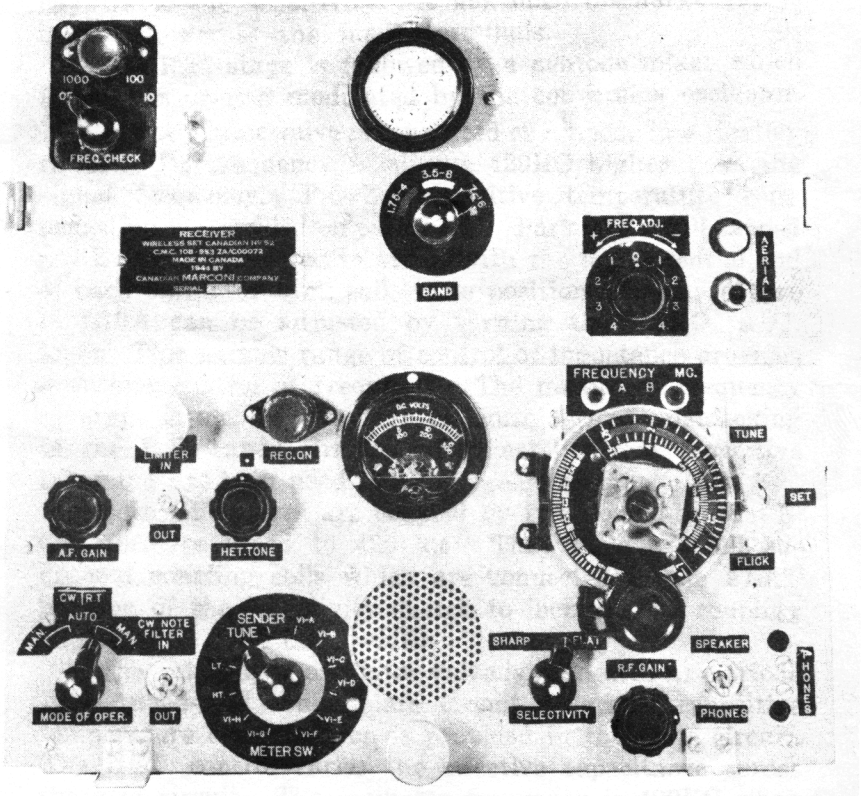
Richard Hankins, VMARS Archivist, Summer 2004

WIRELESS SET, CANADIAN, No 52



Wireless Set Canadian No. 52

The Receiver is a thirteen valve three band superheterodyne. Twelve volt indirectly heated valves are used in every stage. The crystal calibrator valves are type 12SC7 double triodes; the second detector and AVC stage, and the noise limiter stage use type 12Y4G double diodes; all the amplifying stages and the two oscillators use type ARP3 pentode valves.

When the Receiver is used in the Carrier the input to the tuned R.F. amplifier is taken from the P.A. tank circuit in the Sender. When the Sender tank circuit is tuned to the Receiver frequency its resonance characteristics contribute to the image frequency attenuation and slightly to the sensitivity. A gas filled discharge gap is connected across the input terminals.

The R.F. stage is followed by a pentode mixer which is suppressor-grid modulated by the conversion oscillator.

The oscillator valve is connected as a triode in a Hartley circuit. Its frequency is always 420KC higher than the signal frequency. Parallel capacitive temperature compensation is provided on each band. Part of a small tapped coil L10A is connected in series with the low potential end of each oscillator tank coil. The position of an iron core in L10A can be adjusted by turning the FREQ. ADJ. knob. This narrow range of control of inductance provides a vernier control of frequency. The maximum frequency coverage is not large enough to cause serious mistracking in the R.F. tuned circuits. Permeability and capacitive trimming are both used in all ganged circuits.

Both I.F. stages are coupled by two double-tuned I.F. transformers tuned to 420 k.c. They include small additional coupling coils which are connected in the FLAT position of the Selectivity switch to increase the coupling and therefore the band width.

The heterodyne oscillator valve is connected as a triode in a tuned-grid tuned plate circuit. Parallel capacitive temperature compensation is provided in the plate circuit. The HET. control varies the effective capacitance across the grid circuit. The oscillator frequency is 420KC when the dot on the HET. knob is at the dot on the panel.

Separate diodes of V2A are used for the audio and AVC circuits. Full AVC voltage is applied to the R.F. Mixer and 1st I.F. valves; partial AVC voltage is applied to the 2nd I.F. and 1st AF valves. AVC voltage is applied to these valves when the Mode of Operation switch is at AUTO and is removed when the switch is at MAN. When switching from R.T. to C.W., in the AUTO positions, the time delay is increased so that the AVC voltage does not follow the large signal input changes between key up and key down conditions of the sending station. In the two C.W. positions plate voltage is applied to the Het. oscillator.

The A.F. amplifier comprises two resistance coupled pentode stages; the output valve is transformer coupled to match low resistance phones and the permanent magnet dynamic speaker.

There are two noise limiting devices. One is a combination series and parallel limiter which uses both diodes of V2B. Diode 3 is connected in series with the audio lead from the diode load resistors to the 1st A.F. grid. When a noise pulse occurs, the cathode potential does not change, but the plate potential becomes more negative; the result is that instantaneously the diode does not conduct and does not transmit the pulse. Diode 5 which normally is not conducting is connected through the conducting diode 3, to the audio load resistor. When the pulse occurs the cathode becomes sufficiently negative for the diode to conduct and condenser C3Z is shunted across the audio load. It's really amazing, but it works. This limiter is very useful on short duration pulses of large amplitude such as ignition noise from charging sets or vehicles.

The other gadget is an audio resonant network which is connected as a feed-back path between plate and grid of the 1st A.F. valve V1G. The network peaks symmetrically the response of the audio amplifier at about 1000 cycles and sharply attenuates all audio notes above and below that frequency. It provides a great gain in signal-to-noise ratio on C.W. with all types of noise. Since it cannot be used on R.T. an IN-OUT switch is provided on the panel.

The Crystal Calibrator is a miniature sender which includes three separate oscillators. The frequencies of these are 1000 kc., 100 kc., and 10 kc. Each oscillator generates harmonics which are heard in the Wireless Set. For example when the 1000 kc. oscillator is used, although 1000 kc. is not within the range of the Set, signals can be heard at 2000 kc., 3000 kc., 4000 kc. and so forth, up to 16000 kc.

Similarly when the 100 kc. oscillator is switched on harmonics of 100 kc. are heard in the Set. When the 10 kc. oscillator is turned on harmonics of 10 kc. can be heard from 1.75 mc to 16000 kc. The lowest in frequency is the 175th harmonic and the highest is the 1,600th harmonic.

The three valves of the crystal calibrator are double triodes.

Separate triodes of V3A are used for the 1000 kc. and 100 kc. oscillators. The frequencies are controlled by a dual frequency crystal which vibrates at 1000 kc. in one direction and 100 kc. in another direction. The 100 kc. is more accurate in frequency than the 1000 kc. signal. It is provided with a frequency adjustment C49A which is set at the factory. **Do not touch this adjustment.**

The 10 kc. oscillator uses both triodes of V3B in a multivibrator circuit. The output voltage of the 100 kc. oscillator is applied to one multivibrator plate and controls the frequency of the multivibrator circuit so that its frequency and the frequency of all its harmonics are as accurate as the frequency of the 100 kc. oscillator.

The frequency at which the multivibrator is controlled depends upon the magnitude of the 100 kc. voltage which is applied to it. At low voltages the multivibrator oscillates at 9.09 kc. As the control voltage (100 kc.) is increased, a value is attained at which the multivibrator frequency suddenly alters to 10 kc. As the control voltage is further increased, a value is attained at which the frequency suddenly changes to 11.1 kc. This control voltage can be adjusted by a potentiometer, R29A. The potentio-

meter is properly set at the factory so that the frequency of the multivibrator is 10 kc. This adjustment must not be altered unless the frequency of the multivibrator has changed on page 11. This is not likely to occur. It is possible however, to find that the multivibrator has changed frequency after a valve has been changed or after an extreme change of temperature. The potentiometer must then be reset as described on page 12.

V3C is an output valve which separates the 1000 kc. and 100 kc. oscillator from their load and, because it is connected as a diode rectifier, exaggerates the harmonic content of the signals.

When the calibrator is switched OFF it is severed from all voltage supply so that it does not draw power when idle.

BAND	FREQ. RANGE
1	1.75 - 4 M.C.
2	3.5 - 8 M.C.
3	7 - 16 M.C.

RECEIVER VALVE LIST

FUNCTION	SYMBOL	TYPE
R.F. Amplifier	V1A	ARP3
Mixer	V1C	ARP3
Conversion Oscillator	V1B	ARP3
1st I.F. Amplifier	V1D	ARP3
2nd I.F. Amplifier	V1E	ARP3
Detector and A.V.C.	V2A	12Y4G(ARDD1)
Noise Limiter	V2B	12Y4G(ARDD1)
Heterodyne Oscillator	V1F	ARP3
1st A.F. Amplifier	V1G	ARP3
2nd A.F. Amplifier	V1H	ARP3
Crystal Calibrator: Oscillator	V3A	12SC7
Multivibrator	V3B	12SC7
Harmonic Exaggerator	V3C	12SC7

Receiver Sensitivity: About 2.5 UV on R.T.
About 1 UV on C.W.

SIGNAL TO NOISE RATIO *10:1*

THE RECEIVER CONTROLS

BAND: This switch selects the frequency band on which the Receiver will operate. The range at each position is marked on the panel.

MODE OF OPER: This switch provides the choice of reception of R.T., M.C.W., or C.W. Signals.

There are two R.T. and two C.W. positions. The former are used for both R.T. and M.C.W. reception. The latter only for C.W. All types of signal can often be located more easily on C.W. than on R.T.

The AUTO position will normally be used on R.T. There is little fading of signals and most stations appear to have about the same strength. It is particularly useful when communicating with several stations, (either on R.T. or C.W.) because the GAIN controls will not require much readjustment. Set the R.F. GAIN at maximum and use the A.F. GAIN for volume control whenever the AUTO position is used.

The MAN. position provides greater volume and slightly more sensitivity than the AUTO position. Signals from various stations will have widely different strengths and some will fade. However C.W. signals may be more stable. The MAN. position must be used for break-in operation. Whenever the MAN. position is used, set the A.F. GAIN control at maximum and use the R.F. GAIN for volume control. You must be careful when using the MAN. position not to set the R.F. GAIN too high, or the signal will be distorted. You are least likely to do so when the A.F. GAIN is at maximum.

FREQUENCY: This is the tuning dial on which all three bands are calibrated. It is equipped with a two speed slow motion drive. There are two knobs, the larger for coarse movements, the smaller for accurate tuning. They provide tuning at two speeds, slow and very slow.

FREQUENCY ADJ.: This knob is also a tuning control. It has a range of only a few Kc above and below whatever frequency the main tuning dial has selected. The ± signs show the directions of rotation to raise or lower the frequency. If any drift of carrier frequency or of the Receiver occurs, it can be corrected with the FREQ. ADJ. knob without altering the flick position. It is particularly useful when several stations on a net differ slightly in frequency. Each can be tuned in accurately by a twist of the FREQ. ADJ. knob. It is also useful when searching near the Receiver frequency at high frequencies, because it provides finer tuning than the main dial. The range of the FREQ. ADJ. increases with frequency. There is a detent at the zero position and the knob should be at this position when the FREQUENCY dial is being used—particularly when netting, or when on SHARP selectivity.

HET. TONE: This control is used to vary the pitch of the audio note which is heard when listening to C.W. signals. When a signal has been tuned in properly the dot (•) on the panel indicates approximately the zero beat position. The same note can be obtained by turning the control in either direction from the centre position, but an interfering signal may be much weaker on one side than on the other. Often the pitch of the

desired signal can be adjusted to a value at which the note of an interfering signal is either very low or very high and therefore less objectionable.

When netting or when tuning to a C.W. signal this control must be at the centre position.

A.F. GAIN: This Control is used to adjust the volume of the Receiver when operating on AUTO. For MAN. operation it should be left at maximum.

H.F. GAIN: This control is used to adjust the gain of the Receiver. For AUTO operation it should be left at maximum unless the distance between stations is so small that the quality is poor. For MAN. operation it should be used as a volume control with the A.F. GAIN at maximum.

SELECTIVITY: This switch will normally be used at FLAT on R.T. and SHARP on C.W. An interfering signal a few Kc away from the desired signal will be much weaker when the switch is at SHARP than at FLAT, and the background noise is lower. However on R.T. the reduction in quality offsets most of this gain, so that it will be used mostly on C.W. The sensitivity is slightly higher on FLAT. Always use the SHARP position when operating the Calibrator, using the tuning meter, or netting; use the FLAT position when searching for signals, or listening to R.T. Signals.

METER SW.: By means of this switch the Receiver meter is used for several purposes.

At L.T. and H.T. it measures the Receiver Supply voltages; at the eight positions from V1A to V1H it tests Receiver valves page 14) ; and at the TUNE position it is used as a tuning meter. In the latter position correct tuning is indicated by a dip of the needle to a low value. This must be done with the R.F. GAIN turned well up, with the SELECTIVITY switch at SHARP, and with

the Mode of Operation Switch at AUTO. It is required principally on very strong signals, and will be used to tune the Receiver accurately when the sets are close. When the Remote Receiver is operated from an A.C. power source, the LT position is inoperative.

When the switch is at SENDER the meter indicates that function which is chosen by the Sender meter switch.

C.W. NOTE FILTER: This filter is used on C.W. only, to reduce noise and interference. It is very effective and the operating skill that it requires is abundantly repaid. When it is switched in, all audio notes above and below 1000 cycles are greatly reduced in volume. To use it turn the HET. TONE to the dot, tune to the zero beat of the desired signal, and switch the C.W. NOTE FILTER to IN. The noise will become much weaker. Now turn the HET. TONE slowly in either direction until a pitch is reached at which the signal can be heard clearly above the noise or interference. With a little practice the pitch at which this occurs can be recognized by its rather unusual note. When two stations interfere badly, often the desired signal can be received fairly clearly with the filter in by carefully adjusting the HET. TONE Control until the one signal is loud and the other is faint. The signal will probably be better on one side of the HET. TONE dot than on the other.

NOISE LIMITER: This is a simple in and out device which reduces the interference caused by some types of noise. When there is noise of the "click" type, such as interference from gasoline engines or Charging Sets, the signal will be much clearer with the switch at IN. Since the gain of the set is lower when the switch is IN, it will be most

effective on fairly strong signals. It can be used on R.T. and C.W. but, unlike the C.W. NOTE FILTER, is effective only on certain types of noise.

SPEAKER-PHONES: This switch feeds the Receiver output to either the phones jacks or to the loud-speaker.

To use the Crystal Calibrator (Black gadget upper left hand corner)

You can tune the Receiver accurately to any frequency by using the Calibrator. It is a very clever device so you should practice using it until you are expert. When properly used it will give you the correct frequency, speedily and absolutely reliably.

The operation is described by giving an example at 4.43 mc. It is assumed that you want to set the flick. If not, just leave the lever at TUNE.

How to do it at 4.43 Mc.

(a) Remove the lead from the Receiver AERIAL terminal.

(b) Turn the FREQ. CHECK to 1000. (The light should come on) Allow about one minute for the valves to become warm.
MODE OF OPER. to C.W. AUTO
FREQ. ADJ. to ZERO
HET. TONE to DOT
A.F. GAIN to maximum
SELECTIVITY to SHARP
BAND switch to proper frequency band.
(Band 2, 3.5-8 M.C. in this example)
NOISE LIMITER and NOTE FILTER switches OUT
SPEAKER-PHONES to PHONES

(c) Engage the flick; turn the lever to SET; loosen the corresponding two screws ½ turn.

(d) Turn the FREQUENCY dial (hereafter called "the dial") across the band; pips will be heard at the 4, 5, 6 marks etc. Tune to zero beat at the 4 Mc. pip.

(e) Turn the FREQ. CHECK switch to 100. The pip will still be heard but will not be at zero beat. Tune to zero beat.

(f) Turn the dial slowly toward the 4.4 mc. mark. A pip will be heard near every dial mark. (Also between marks on band 3). Count the zero beat points omitting the one at 4.00 Mc. They occur exactly at 4.10, 4.20, 4.30 Mc. etc. Tune to the 4th one.

(g) Turn the FREQ. CHECK to 10. You will still be at zero beat of the 4.40 mc. pip. Turn the dial by the smaller knob toward the 4.45 mc. mark. As it is turned, pips will be heard at 4.41; 4.42 mc. etc. Count the zero beat positions omitting the one at 4.40 mc. and tune the third one. Turn the R.F. GAIN until the volume is low and readjust the dial if necessary.

(h) The Receiver is now tuned to 4.43 mc. and the flick screws may be tightened. **(By Hand)**

(i) Rotate the dial out of the flick and then back. The signal should be near zero beat. If necessary a small correction can be made with the FREQ. ADJ. knob. Correction should not usually be necessary except at the highest frequencies.

If the frequency had been 4.46, you would have tuned to the 5th zero beat, 4.50 mc. at step (f), and then would have counted back four zero beat points to 4.46 mc. in step (g).

(j) Turn the Calibrator OFF, replace the aerial lead, and adjust the controls for Receiver operation.

NOTES:

(i) When counting pips you actually count the zero beat positions.

(ii) The pip from which you start is always the "zero" pip and is not counted; the next pip is the first. e.g. start at 2.30, the next is 2.31; or start at 14.00 the next is 14.10 or start at 14.30 the next is 14.31 etc.

(iii) The pips are close together and are sharp on band 3. Tune carefully.

(iv) It is very unlikely that any interfering signal will be heard and be mistaken for a pip unless the aerial lead is left connected to the Receiver. However by switching the Calibrator OFF momentarily you can identify a note as a calibrator pip or a signal.

4.5.2 Calibrator Test for Proper Operation

The following test should be performed before operations, during weekly maintenance, and after a Calibrator valve has been changed. It will show definitely whether the frequency interval between 10 Kc. pips is exactly 10 Kc. The intervals between 100 Kc. or 1000 kc. pips will always be correct and need not be checked.

Proceed as follows:

(a)
(b) } See (a) and (b) page 9

(c) Tune the dial to the zero beat at the 2 mc. pip. It will be found near the 2 mc. mark on the dial.

(d) Turn the FREQ. CHECK switch to 100. The pip will still be heard although not at zero beat. Tune to zero beat.

(e) Turn the switch to 10. You will still be tuned to the zero beat of the 2.00 mc. pip.

(f) Turn the dial slowly toward 2.1 mc. counting the zero beat points. The one at 2.00 mc. is not counted of course. Stop at the tenth pip, just off the zero beat point so that a note can be heard.

(f) Turn the switch to 100. If the pip is still heard the Calibrator is operating properly and the frequency interval between any two adjacent 10 kc pips is exactly 10 kc. If the 100 kc. pip can be heard only when the dial is stopped at the ninth or eleventh pip, an adjustment must be made.

Calibrator Adjustment

After changing any of the valves in the crystal calibrator it is important to check the number of calibrator pips as described on page 11

If in that test nine or eleven pips are heard between 2.00 mc. and 2.10 mc. the following adjustment must be made:

(a) Remove the upper Receiver panel just as you would to change a valve.

(b) On the Calibrator chassis is a small control which can be turned with a screwdriver. It has been properly adjusted by the manufacturer and is sealed with wax. DO NOT TURN THIS CONTROL UNLESS THE NUMBER OF "PIPS" HEARD IN THE TEST page 11 IS INCORRECT.

(c) Turn the Wireless Set ON. Turn the Calibrator to 10. Allow the valves to become warm for a minute or two. Tune in one of the pips. Choose one which lies between two dial marks, so that no signal is heard when the switch is at 100.

(d) If nine pips were counted in the test, turn the control slowly counter-clockwise while listening to the note in the receiver. If the number of pips was eleven, turn the control slowly clockwise. As the control is turned a place will be reached where the note changes pitch. Notice the position at which this occurs, (position A) and continue turning. When the pitch of the note changes again, stop turning. This is position B. Turn the control back until it is half way between positions A and B.

(e) The Calibrator should now operate properly. Repeat carefully the test described on page 11 to be sure that the adjustment has been successful.

The Calibrator Valves

These are tested by using the Receiver to listen to the calibrator output—which can only be done of course if the rest of the Receiver is operating properly.

(a) No signal when the calibrator switch is at 1000 or 100, and a jumble of signals when the switch is at 10:—Probably V3A, possibly V3C.

(b) No signal when the calibrator switch is at 1000, but normal signals when the switch is at 100 or 10:—V3A.

(c) Normal signal when the Calibrator switch is at 1000, no signal when the switch is at 100 and a jumble of signals when the switch is at 10:—V3A, or the crystal is faulty, see below.

(d) Normal signals when the Calibrator switch is at 1000 and 100, but no signals when the switch is at 10:—V3B.

(e) No signal when the Calibrator switch is at 1000, or 100 but normal signals at 10:—V3C.

NOTE:—When V3B or V3A have been changed, the test described on page 11 must be made. In some cases it will be necessary to make the adjustment described on page 12 after either of these valves has been changed.

(f) Symptom (c) can be caused by a broken or dirty crystal. A temporary repair can often be made by opening the crystal holder and cleaning the quartz plate and the electrodes carefully with carbon tetrachloride or with soap and water. When you are through, the crystal should be really clean—hold it by the edges so that your fingers will not contaminate the surface. After cleaning the crystal replace it so that the arrows on both sides of the case are parallel to the short sides of the crystal. When the crystal assembly is replaced, these arrows must point vertically upwards when the Calibrator and Receiver are

mounted normally. Since the holder was originally sealed with wax and the seal has now been broken, this repair should only be done in an emergency and must be considered as a temporary repair.

Important

All essential and maintenance spare valves for the 52 Set crystal calibrator have been aged and are ready for use. They are identified by a blue paint mark on the locating pin. If any Type 12SC7 valves which have not this mark are used, turn the calibrator to 10 and operate the valves for 12 hours before performing test p 11 and adjustment on page 12

The Receiver Diodes (V2A, V2B)

V2A can be tested satisfactorily only by substitution or in a valve tester. If the Receiver has very low output, (distorted) or none at all and shows no meter change on TUNE, the valve may be faulty.

V2B is probably defective if the noise limiter does not work and if the output level does not change when the switch is operated.

THE METER

A single D.C. Meter mounted on the Receiver panel is used for Receiver Valve and Voltage Test and Tuning

TYPICAL RECEIVER METER READINGS

Mode of Operation Switch at R.T. MAN.

R.F. GAIN at Maximum—Input 12.5V

H.T.	L.T.	TUNE	V1A	V1B	V1C	V1D	V1E	V1F **	V1G	V1H
150	12.5	11	2.3	*	3.0	11	11	3.2	2.3	9.6

* Band 1 7.0
Band 2 6.5
Band 3 3.3

** Mode of operation at C.W. MAN.

THE SUPPLY UNIT ZE12

Power for the Receiver is obtained from a vibrator Supply Unit ZE12 which operates from 12 v.d.c. or from 115 V. A.C. 25-60 cycles or from 230 V. A.C. 25-60 cycles.

(a) 12 V.D.C. Operation.

(i) Remove the ZE12 Cover. Put the removable plug into the socket marked D.C. Wind the A.C. line cord around the clips and insert the plug into the socket on the chassis which is marked with a circle. Make sure that the vibrator and valve are securely seated, and replace the cover.

(b) A.C. Operation.

(i) Remove the ZE12 cover. Turn the main switch OFF. Put the removable plug in the A.C. socket.

Do not connect the line cord unless you are certain that:

(a) The Supply current is a.c. NOT d.c.

(b) The toggle switch is in the correct position for the existing line voltage.

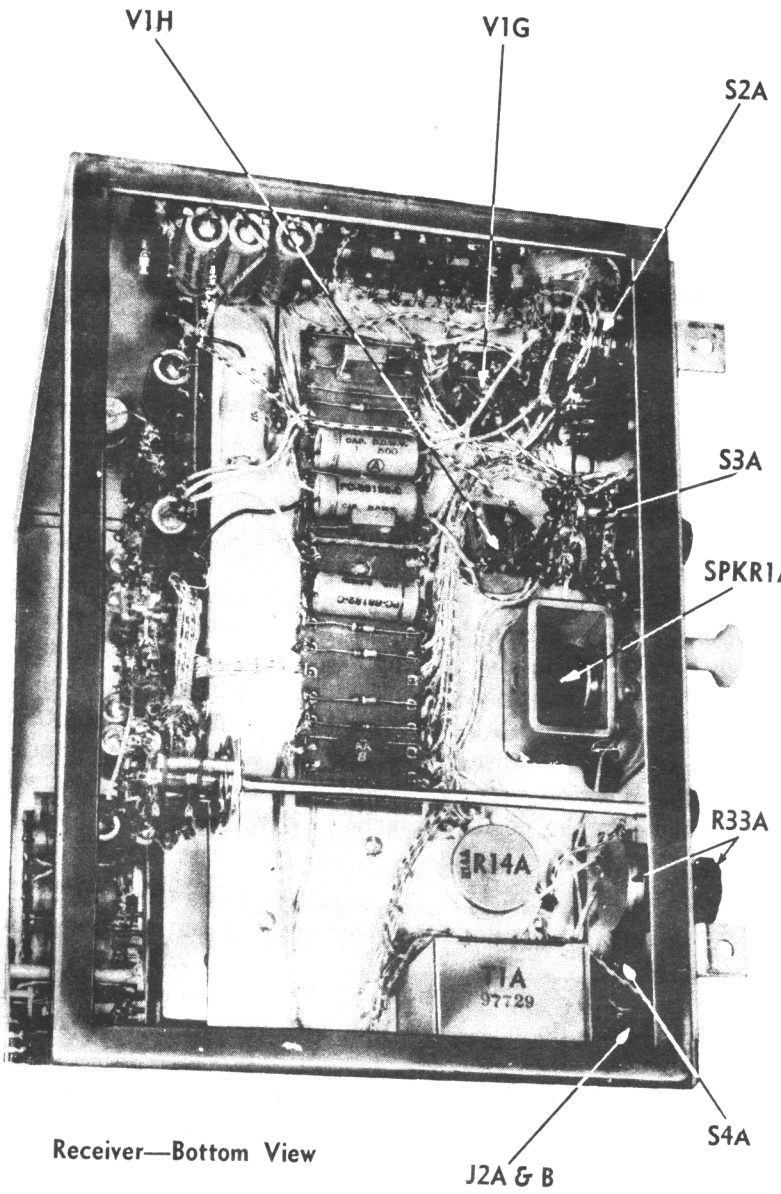
There is a toggle switch just behind the A.C.—D.C. sockets. If the switch handle is not already pointing to the correct line voltage (115 or 230V) remove the clamp; put the switch to the correct voltage, and replace the clamp.

If the lire voltage is 230V the toggle switch must be in the position marked "230V"; if it is 115V the switch must be in the position marked 115V.

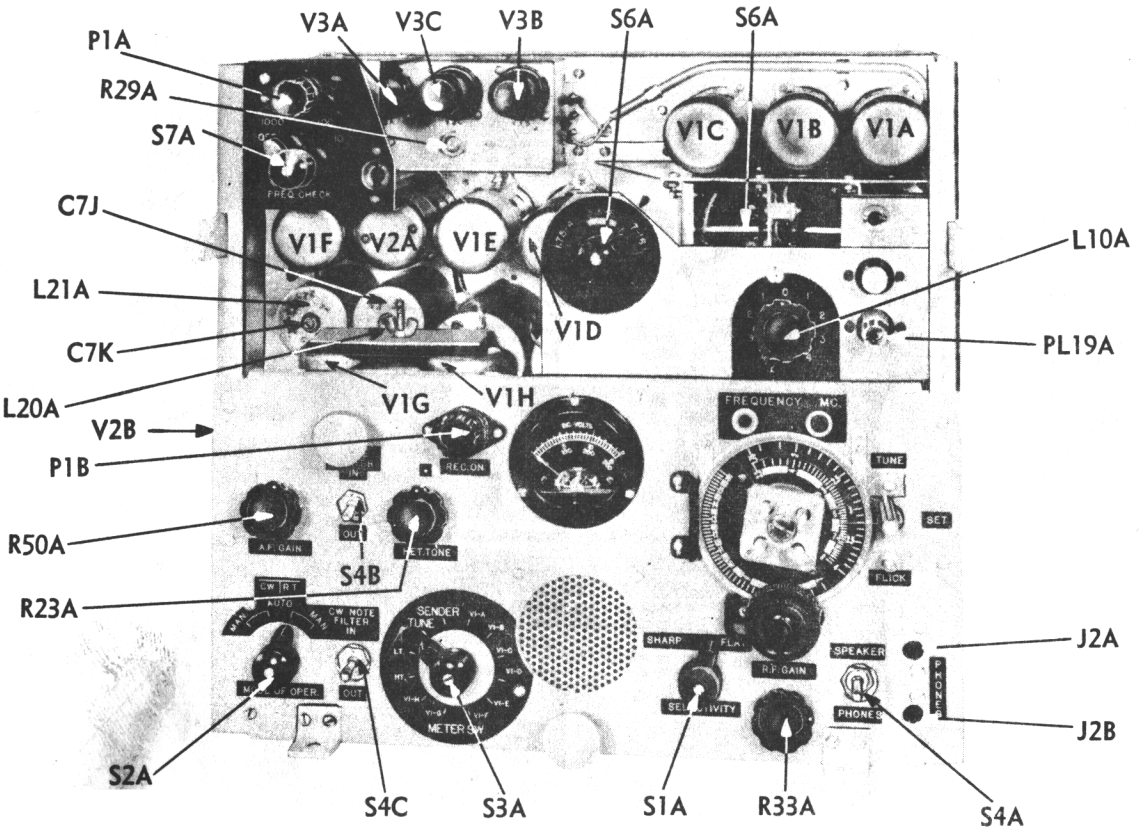
If this switch is in the wrong position the Supply Unit ZE12 and the Remote Receiver may be burned out almost instantly.

If you do not know the line voltage, either measure it or ask.

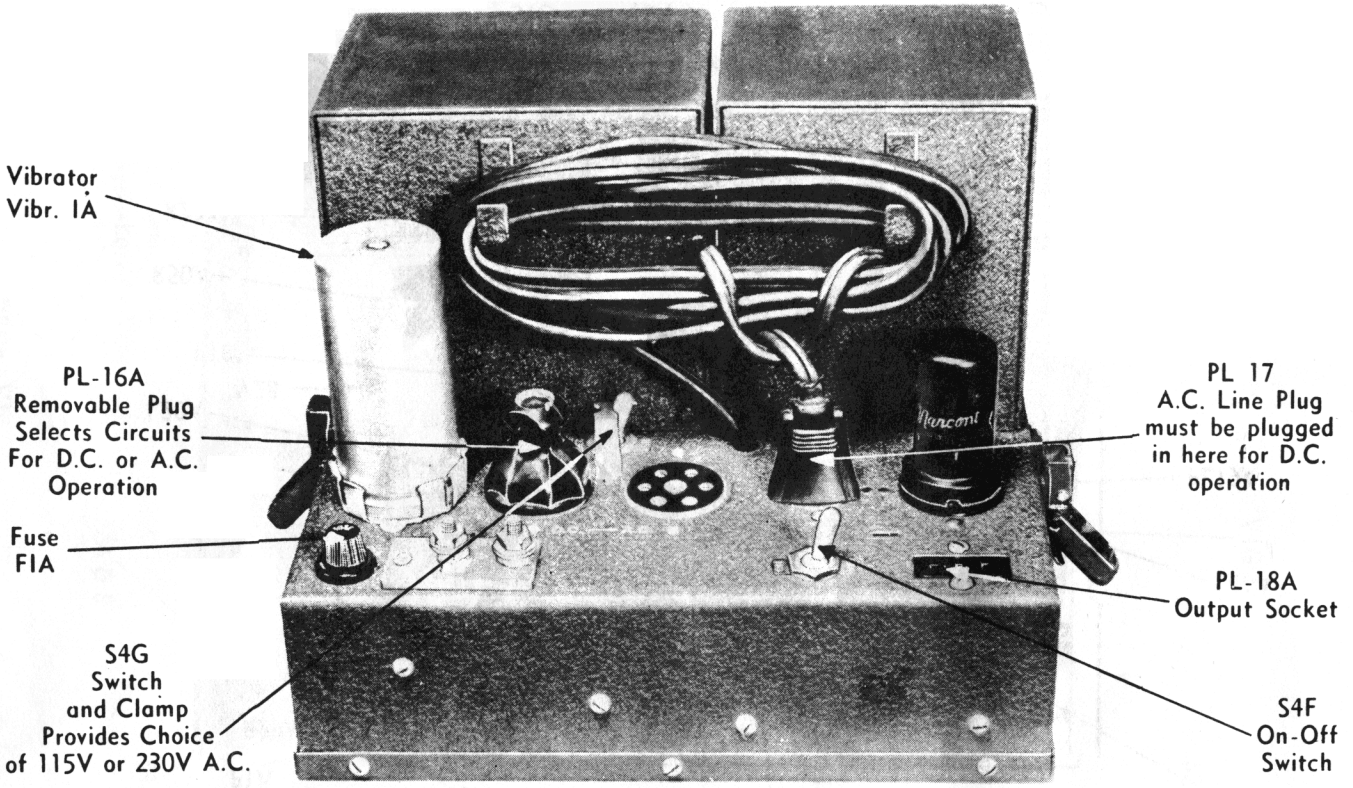
(ii) Unwind the line cord and replace the cover. There is a small cut-out in the cover to clear the cord. Attach the line plug to the A.C. line socket.



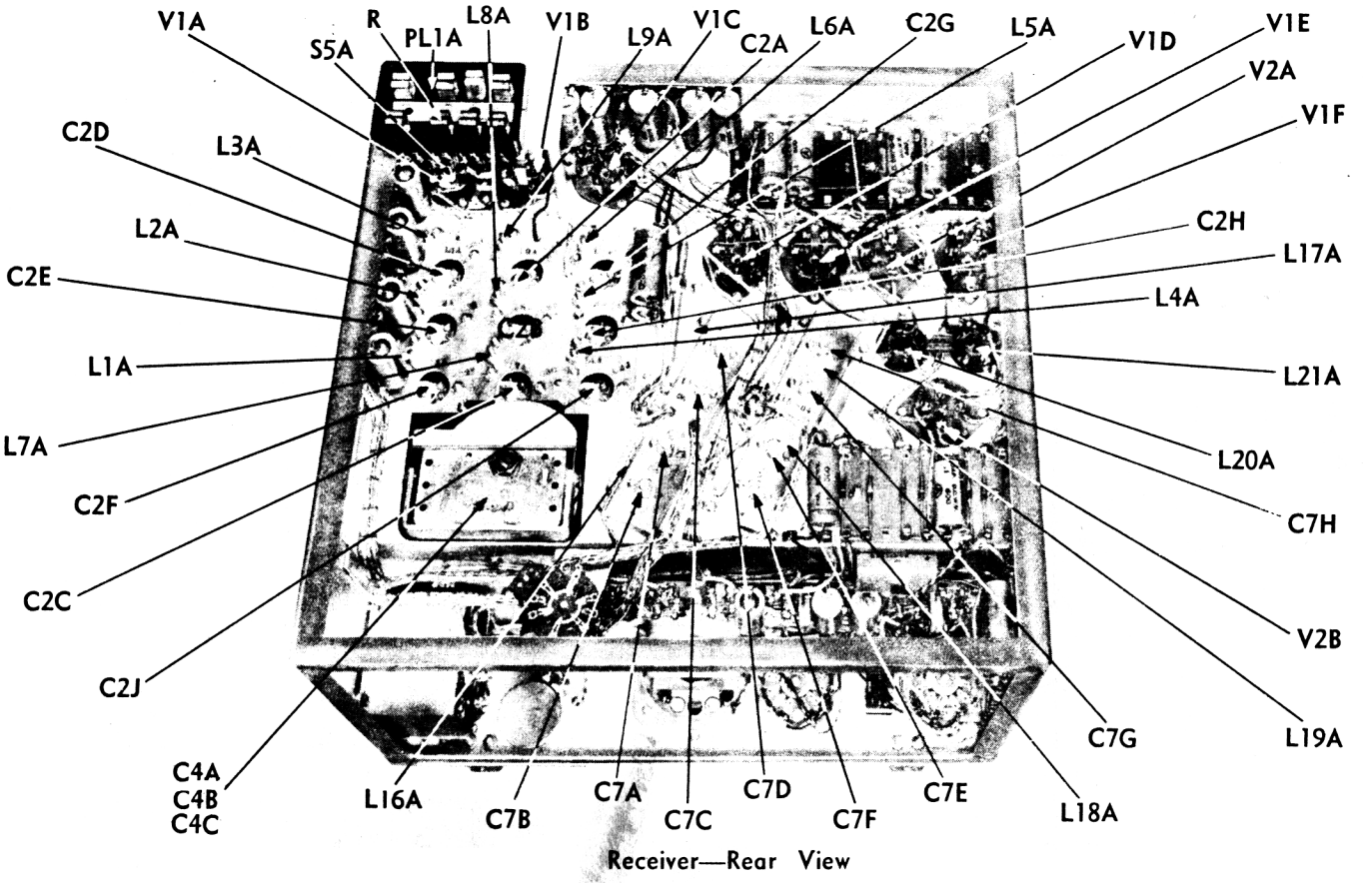
Receiver—Bottom View



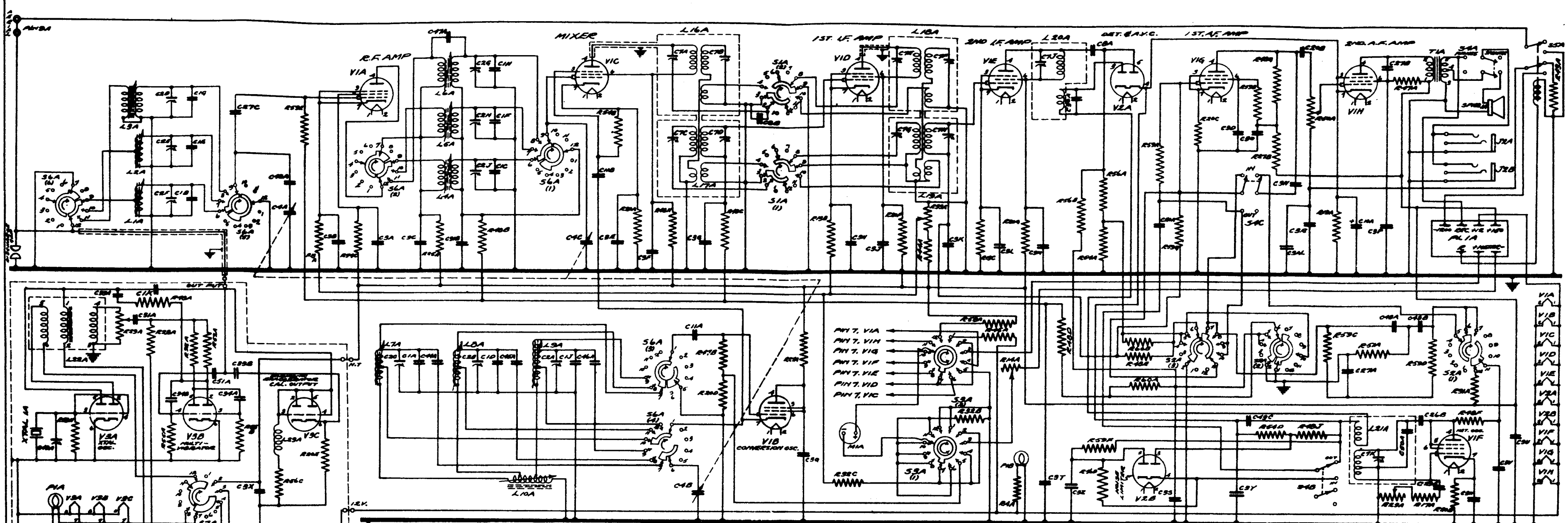
Receiver—Upper Panel Removed

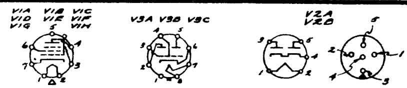


Supply Unit ZE-12 without Cover



Receiver—Rear View





BOTTOM VIEW OF SOCKETS

SPEAKER	
SPKR-1A	A.F. AMP.

CRYSTAL	
XTAL-1A	OSC.

JACKS	
J2A	HEADPHONES
J2B	HEADPHONES

PILOT LAMPS	
P1A	CRYSTAL CAL.
P1B	TUNER UNIT

CONNECTORS	
PL1A	RECEIVER
PL19A	AERIAL

METER	
M1A	TEST & TUNE

CONDENSERS	
C1A	20 MMF.
C1B	20 MMF.
C1C	20 MMF.
C1D	20 MMF.
C1E	20 MMF.
C1F	20 MMF.
C1G	20 MMF.
C1H	20 MMF.
C1J	20 MMF.
C1K	20 MMF.
C2A	4-30 MMF. (VAR.)
C2B	4-30 MMF. (VAR)
C2C	4-30 MMF. (VAR)
C2D	4-30 MMF. (VAR)
C2E	4-30 MMF. (VAR)
C2F	4-30 MMF. (VAR)
C2G	4-30 MMF. (VAR)
C2H	4-30 MMF. (VAR)
C2J	4-30 MMF. (VAR)
C3A	0.1 MFD.
C3B	0.1 MFD.
C3C	0.1 MFD.
C3D	0.1 MFD.

CONDENSERS	
C3E	0.1 MFD.
C3F	0.1 MFD.
C3G	0.1 MFD.
C3H	0.1 MFD.
C3J	0.1 MFD.
C3K	0.1 MFD.
C3L	0.1 MFD.
C3M	0.1 MFD.
C3N	0.1 MFD.
C3O	0.1 MFD.
C3P	0.1 MFD.
C3Q	0.1 MFD.
C3R	0.1 MFD.
C3S	0.1 MFD.
C3T	0.1 MFD.
C3U	0.1 MFD.
C3V	0.1 MFD.
C3W	0.1 MFD.
C3X	0.1 MFD.
C3Y	0.1 MFD.
C3Z	0.1 MFD.
C3AL	0.1 MFD.
C4A	441 MMF. (VAR.)
C4B	441 MMF. (VAR.)

CONDENSERS	
C4C	441 MMF. (VAR.)
C7A	100 MMF. (VAR)
C7B	100 MMF. (VAR)
C7C	100 MMF. (VAR)
C7D	100 MMF. (VAR)
C7E	100 MMF. (VAR)
C7F	100 MMF. (VAR)
C7G	100 MMF. (VAR)
C7H	100 MMF. (VAR)
C7J	100 MMF. (VAR)
C7K	100 MMF. (VAR.)
C8A	50 MMF.
C8B	50 MMF.
C10A	12 MFD.
C11A	100 MMF.
C11B	100 MMF.
C20A	.01 MFD.
C20B	.01 MFD.
C26B	.002 MFD.
C27A	500 MMF.
C27B	500 MMF.
C27C	500 MMF.
C29A	350 MMF.

CONDENSERS	
C30A	150 MMF.
C31A	.01 MFD. MICA
C31B	.01 MFD. MICA
C33A	2 MMF.
C33B	2 MMF.
C34A	80 MMF.
C34B	80 MMF.
C43A	250 MMF.
C43B	250 MMF.
C43C	250 MMF.
C44A	1004 MMF
C45A	1060 MMF.
C46A	1349 MMF.
C47A	7 MMF.
C48A	.002 MFD.
C49A	25 MMF. (VAR)
C50A	150 MMF
C51A	1 MMF

RESISTORS	
R4A	8 OHMS
R4B	8 OHMS
R13A	300 OHMS
R13B	300 OHMS
R13C	300 OHMS
R14A	300 OHMS (VAR.)
R17A	500 OHMS
R19A	600 OHMS
R20A	1,000 OHMS
R20B	1,000 OHMS
R20C	1,000 OHMS
R20D	1,000 OHMS
R20E	1,000 OHMS
R20F	1,000 OHMS
R20G	1,000 OHMS
R23A	2,000 OHMS (VAR.)
R25A	3,000 OHMS
R27A	5,000 OHMS
R27B	5,000 OHMS
R28A	5,000 OHMS
R29A	5,000 OHMS (VAR.)
R31A	10,000 OHMS
R32A	10,000 OHMS

RESISTORS	
R32B	10,000 OHMS
R32C	10,000 OHMS
R39A	10,000 OHMS (VAR)
R43A	25,000 OHMS
R44A	30,000 OHMS 1W.
R45A	30,000 OHMS
R47A	50,000 OHMS
R47B	50,000 OHMS
R48A	100,000 OHMS
R48B	100,000 OHMS
R48C	100,000 OHMS
R48D	100,000 OHMS
R48E	100,000 OHMS
R48F	100,000 OHMS
R48G	100,000 OHMS
R48H	100,000 OHMS
R48J	100,000 OHMS
R50A	100,000 OHMS (VAR)
R51A	150,000 OHMS
R52A	200,000 OHMS
R54A	250,000 OHMS
R54B	250,000 OHMS
R54C	250,000 OHMS.

RESISTORS	
R54D	250,000 OHMS
R55A	300,000 OHMS
R55B	300,000 OHMS
R56A	500,000 OHMS
R56B	500,000 OHMS
R56C	500,000 OHMS
R56D	500,000 OHMS
R58A	600,000 OHMS
R59A	1 MEGOHM
R59B	1 MEGOHM
R59C	1 MEGOHM
R59D	1 MEGOHM
R59E	1 MEGOHM
R59F	1 MEGOHM
R59G	1 MEGOHM
R59H	1 MEGOHM
R60A	4 MEGOHMS
R60B	4 MEGOHMS

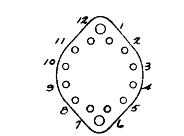
INDUCTANCES	
L1A	ANT. COIL (BAND 1)
L2A	ANT. COIL (BAND 2)
L3A	ANT. COIL (BAND 3)
L4A	DET. COIL (BAND 1)
L5A	DET. COIL (BAND 2)
L6A	DET. COIL (BAND 3)
L7A	OSC. COIL (BAND 1)
L8A	OSC. COIL (BAND 2)
L9A	OSC. COIL (BAND 3)
L10A	OSC. FREQ. VERNIER
L16A	#1 I.F. TRANS.
L17A	#1 I.F. TRANS
L18A	#2 I.F. TRANS.
L19A	#2 I.F. TRANS.
L20A	DIODE I.F. TRANS.
L21A	HET. OSC. COIL
L22A	TANK COIL ASSY
L23A	OUTPUT CHOKE

TRANSFORMER	
T1A	AUDIO OUTPUT

VALVES	
V1A	ARP 3
V1B	ARP 3
V1C	ARP 3
V1D	ARP 3
V1E	ARP 3
V1F	ARP 3
V1G	ARP 3
V1H	ARP 3
V2A	12Y4G (ARDD-1)
V2B	12Y4G (ARDD-1)
V3A	12SC7
V3B	12SC7
V3C	12SC7

SWITCHES	
S1A	SELECTIVITY
S2A	MODE OF OPER.
S3A	METER CCT. SELECT.
S4A	PHONE/LS
S4B	NOISE LIMITER
S4C	TONE FILTER
S5A	RELAY
S6A	WAVE CHANGE
S7A	CRYSTAL CALIB.

TOP OF CHASSIS



VIEW OF WAFER LOOKING FROM KNOB END.

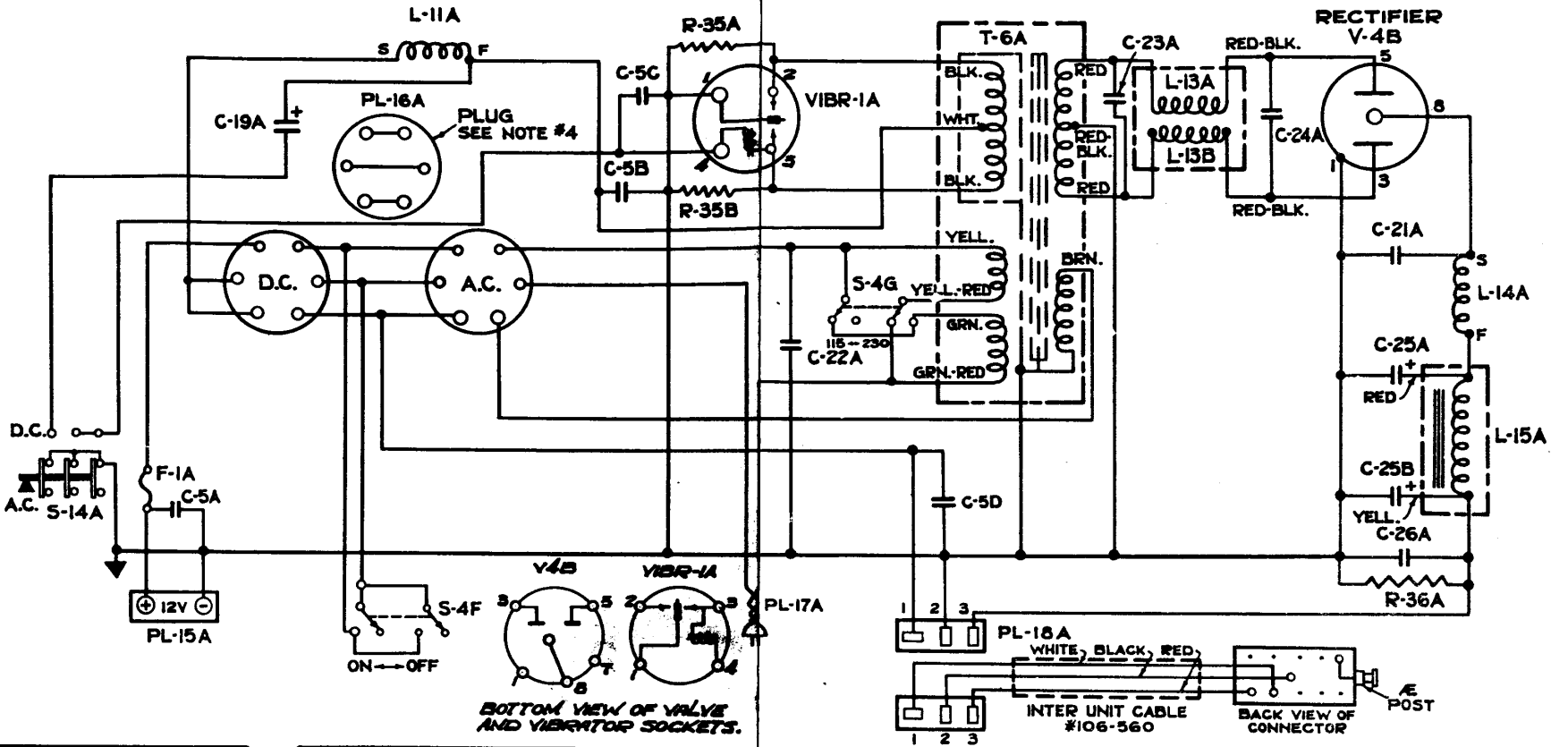
ROTARY SWITCH POSITIONS LISTED IN CLOCKWISE ORDER

S1A * SHARP FLAT S2A * C.W. MAN. C.W. AUTO. R.T. AUTO. R.T. MAN. S3A H.T. L.T. TUNE SENDER V1A V1B V1C * V1D V1E V1F V1G V1H	S6A * 1.75-4 3.5-8 7-16 S7A * OFF 1000 100 10 * DIAGRAM SHOWS SWITCHES IN THIS POSITION.

Note :- SWITCHES (ROTARY) ARE SHOWN VIEWED FROM THE KNOB END IN EXTREME COUNTER-CLOCKWISE POSITION.

DIAGRAM OF CONNECTIONS RECEIVER No 52 WIRELESS SET (CAN) 108-953

52 **Receiver Circuit Diagram.**



NOTES

1. PL-18A CONNECTIONS
   TERM.#1 :- +12V. D.C. OR A.C.
   TERM.#2 :- EARTH
   TERM.#3 :- +150V. D.C.
2. LETTERS ON INDUCTANCES INDICATE START AND FINISH OF WINDINGS.
3. S-14A SHOWN IN NORMAL OR "A.C." POSITION.
4. PL-16A PLUGS INTO SOCKET MARKED "D.C." FOR 12 V. D.C. OPERATION OR IN SOCKET MARKED "A.C." FOR A.C. OPERATION.
5. S-4G SHOWN IN 115 VOLT POSITION.

T-6A	POWER
TRANSFORMER	

F-1A	10 AMPS
FUSES	

PL-18A	OUTPUT
PL-17A	A.C. LINE
PL-16A	A.C./D.C. SWITCHING
PL-15A	D.C. INPUT
PLUGS	

VIBR-1A	4 AMP NON-SYNC.
VIBRATOR	

S-14A	T.P.D.T. SAFETY
S-4G	115/230 VOLTS
S-4F	OFF-ON
SWITCHES	

R-36A	10,000 OHMS 10 WATTS
R-35B	300 OHMS ½ WATT
R-35A	300 OHMS ½ WATT
RESISTORS	

V-4B	OZ4 OR OZ4A
VALVES	

L-15A	13 H
L-14A	1000 μH
L-13B	850 μH
L-13A	850 μH
L-11A	50 μH
INDUCTANCES	

C-26A	0.002 MFD
C-25B	20.0 MFD
C-25A	20.0 MFD
C-24A	0.0075 MFD
C-23A	0.004 MFD
C-22A	0.02 MFD
C-21A	0.1 MFD
C-19A	100.0 MFD
C-5D	0.5 MFD
C-5C	0.5 MFD
C-5B	0.5 MFD
C-5A	0.5 MFD
CONDENSERS	

Fig. 55—Supply Unit ZE-12 Circuit Diagram.

WIRELESS SET, CANADIAN, No 52