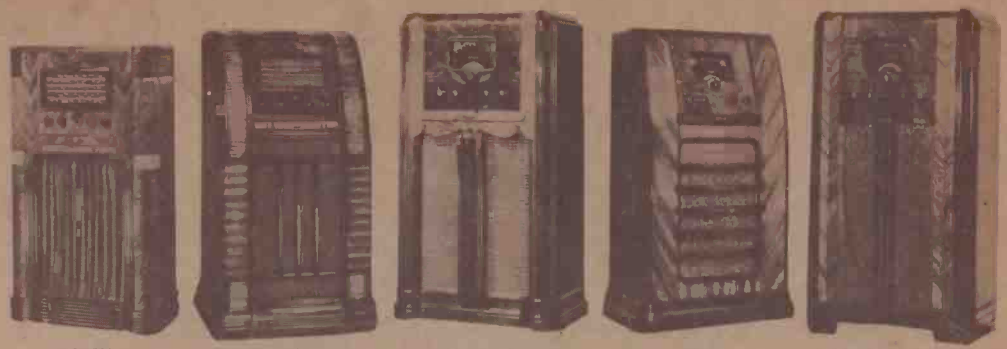
1230X



1029Y 1029X B826X 823Y 823X W622Y B725X

RADIO SERVICE MANUAL

PRICE $1.00 1936-1937 RS-250

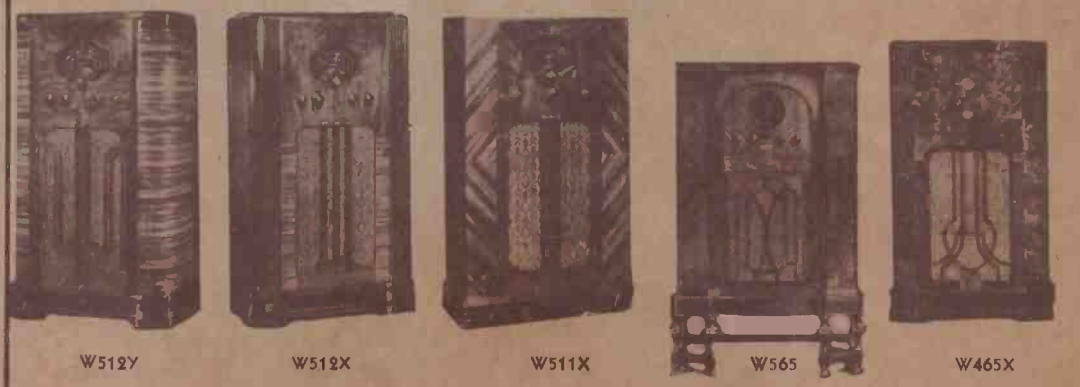
W521X B624X

W622X W527X 1516X W1015Y W1015X

W914Y

W914X B819X W813Y W813X B718X

B517X



W512Y W512X W511X W565 W465X

CANADIAN WESTINGHOUSE

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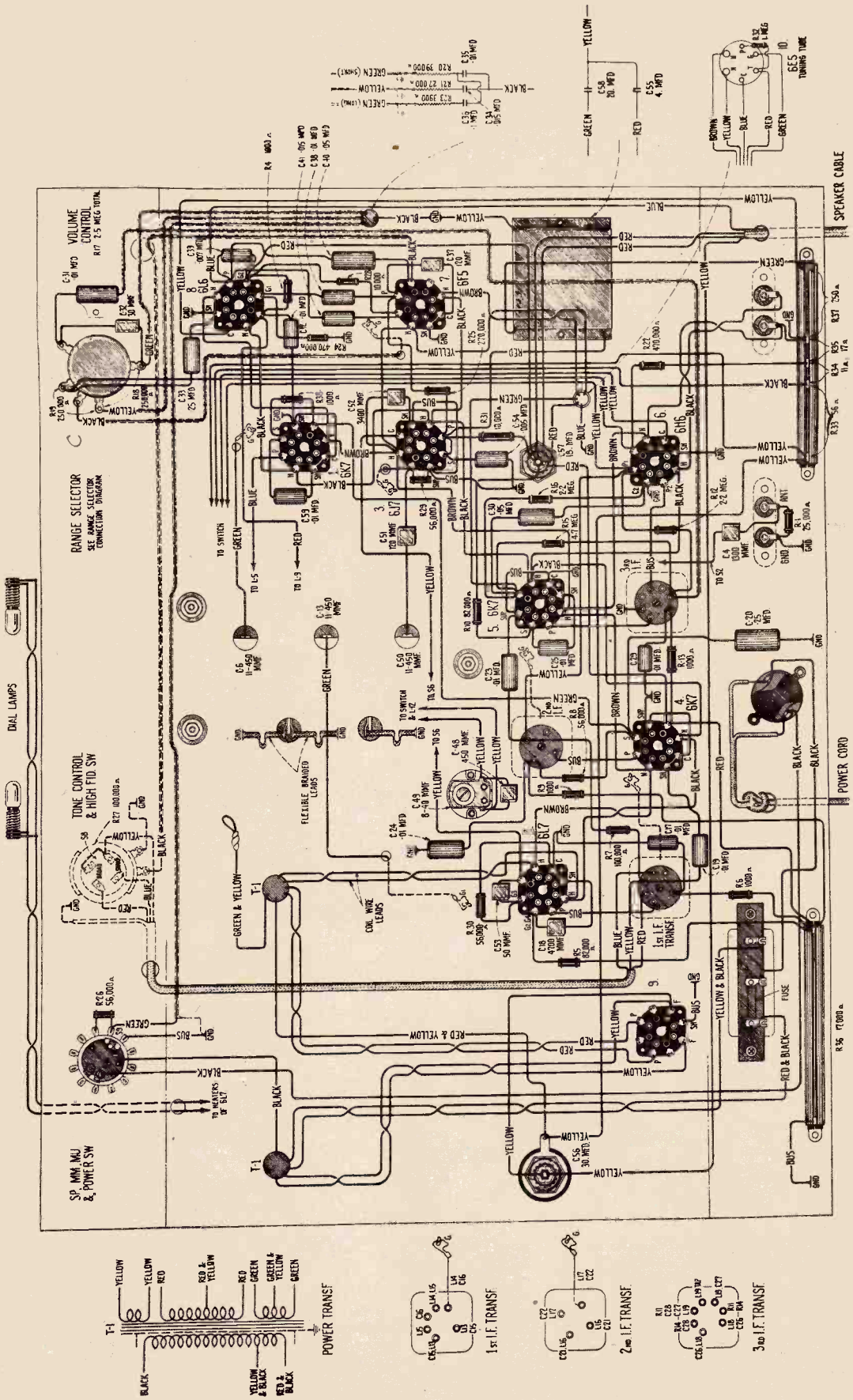
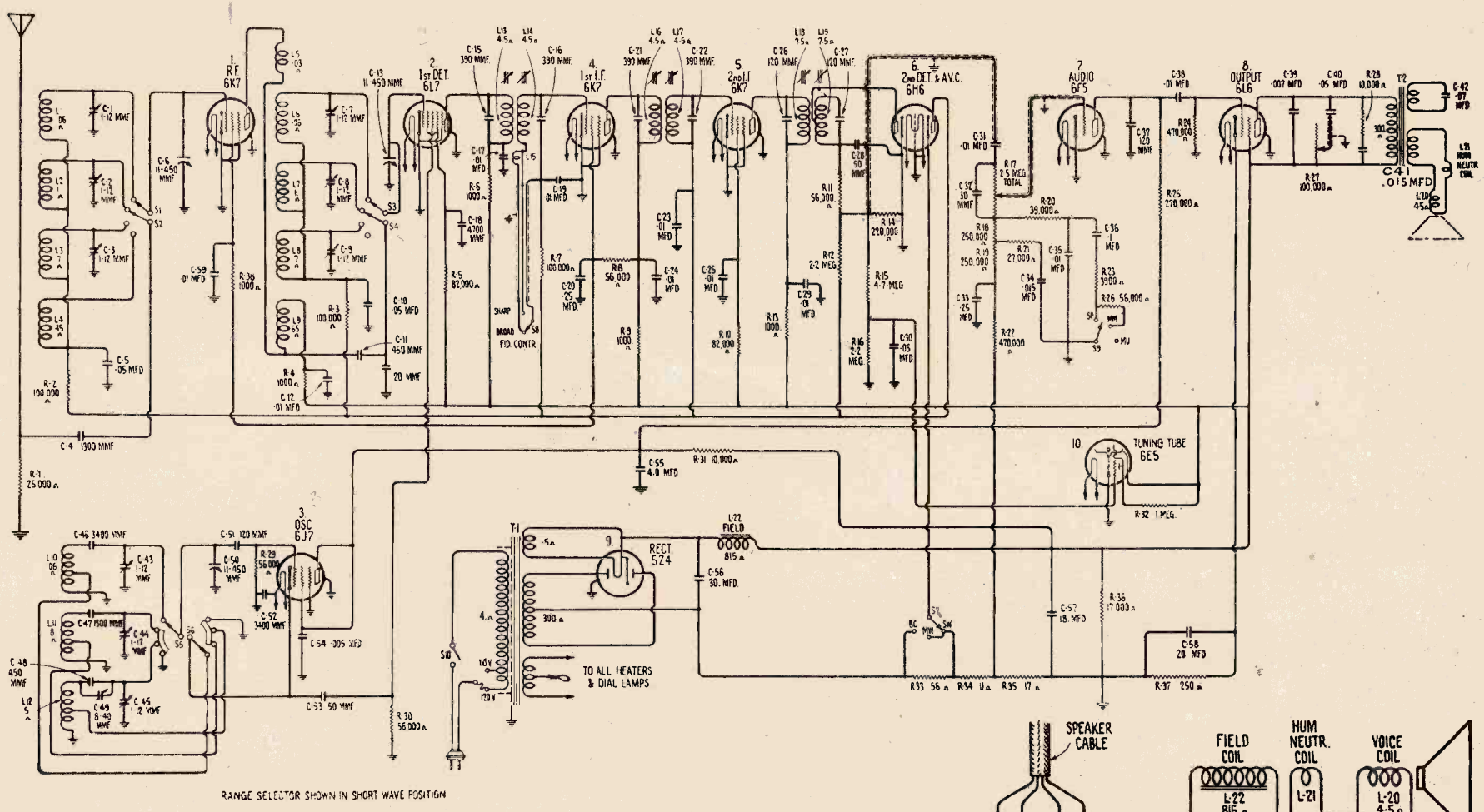
WESTINGHOUSE MODELS 1015X & 1015Y

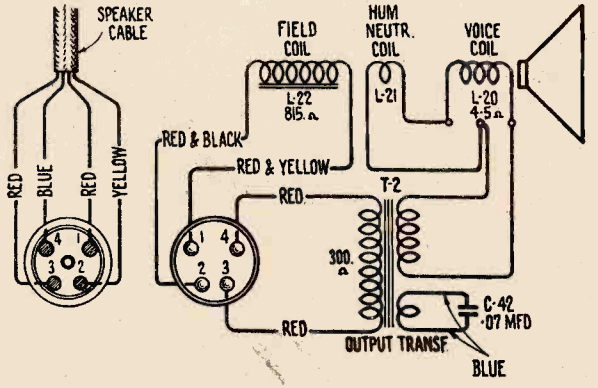


WIRING DIAGRAM

See notes under Schematic Circuit Diagram

WESTINGHOUSE MODELS 1015X & 1015Y

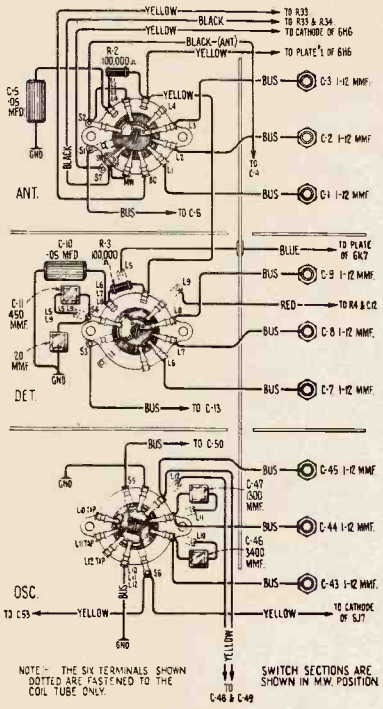




Schematic Circuit Diagram and Reproducer Wiring Diagram

Notes:— 1. On later production the heater winding is grounded at one side instead of at centre. The grounded point is contact No. 2 on the W-6H6 socket. 2. The lower end of tone control R27 was also changed to go to chassis frame instead of to positive plate supply terminal. The chassis wiring diagram is up-to-date.

WESTINGHOUSE MODELS 1015X & 1015Y



Range Selector Wiring Diagram

I.F. Amplifier:

The intermediate frequency amplifier consists of 2 W-6K7 tubes in a two stage transformer coupled circuit. The windings of all three I.F. transformers are resonated by fixed capacitors and are adjusted by moulded magnetite cores, (both primary and secondary) to tune to 460 Kc. A third winding, L15, in the first I.F. transformer is placed in series with the main secondary L14 when the fidelity control switch S-8 is thrown to the "broad" position (see schematic diagram), thereby increasing the coupling between the primary and secondary circuits with consequent broadening of the band width of the I.F. amplifier. The increase band width of the I.F. amplifier therefore causes less attenuation of the higher audio modulation side band frequencies, permitting higher fidelity reception.

Second Detector and A.V.C.:

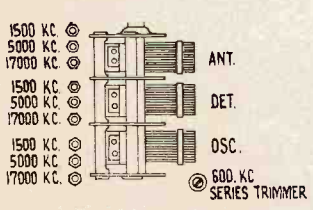
The modulated signal, as obtained from the output of the i-f system, is detected by one of the diodes of the W-6H6 tube, Audio frequency secured by this process is passed on to the control grid of the W-6F5 for amplification before final reproduction. The d-c voltage, which results from detection of the signal, is used for automatic volume control. This voltage, which develops across resistor R14 is applied as automatic control grid bias to the first detector and i-f tubes through a suitable resistance filter.

The other diode of the W-6H6 tube is used to supply normal bias to the first detector and i-f radiotrons until such time as the rectified signal voltage is great enough to overcome the normal bias voltage and start the automatic volume control action.

A portion of the range selector switch (S-7) is used to change the minimum bias on the radiotrons controlled by the AVC voltage, so as to reduce the minimum bias and increase the sensitivity of the receiver on the "medium wave" and "short wave" positions.

R.F. Alignment Points

When adjusting the Air Dielectric R.F. trimmers, it is necessary to use a special tool (See H-29644 in parts list) to slacken the lock nut on the trimmer, previous to the adjustment, and to tighten it again after the adjustment. Another special tool (See H-29643 in parts list) is available for making the actual adjustment to the trimmer. The adjustment should be made upward or downward on the plunger with a twisting motion. The special tool designed by the Canadian Westinghouse Company for this purpose is double ended; one end having a pin for the R.F. adjustments, the other end is a special socket screw driver for use in making I.F. adjustments.



The procedure outlined below should be followed in adjusting the various trimmer capacitors and molded cores:

WHEN ALIGNING THE R.F. CIRCUITS, THE CHASSIS BOTTOM SHIELD MUST BE IN PLACE ON THE CHASSIS AND SECURELY FASTENED WITH ALL OF THE RETAINING SCREWS. IF THE CHASSIS BOTTOM PLATE IS REMOVED, COIL SHIELDING WILL BE INCOMPLETE AND THE R.F. CIRCUIT WILL OSCILLATE. WHEN ADJUSTING I.F. CORES WITH THE CHASSIS BOTTOM PLATE REMOVED OR DOING TROUBLE SHOOTING ON THE CHASSIS, OSCILLATION MAY BE PREVENTED BY USING A SHORT LENGTH OF WIRE WITH TWO CLIPS TO CONNECT TOGETHER THE PARTITION SHIELDS BETWEEN THE ANTENNA AND DETECTOR COILS, AND BETWEEN THE DETECTOR AND OSCILLATOR COILS.

I.F. ADJUSTMENTS USING CATHODE RAY EQUIPMENT

1. Set up the Cathode Ray Equipment in the manner recommended by the manufacturer of the equipment. The frequency modulated oscillator should be connected to the control grid cap of the W-6K7 second I.F. radiotron (with grid lead in place), through a .001 Mfd. capacitor. The grounded side of the test oscillator output should be connected to the receiver chassis frame. The cathode ray oscillograph vertical terminals should be connected to points indicated on the radiotron socket voltage diagram.

2. Place the receiver in operating condition with the fidelity switch on the tone control in the counter-clockwise or selective position. The antenna and ground terminal should be short circuited and if necessary the gang condenser adjusted so that no stray signals are fed into the I.F. amplifier during the adjustment.

Adjust the test oscillator to supply a 460 Kc. audio-modulated signal. Increase the output of the test oscillator until a deflection is noticeable on the oscillograph screen. The figures obtained represent several waves of the detected signal, the amplitude of which may be observed as an indication of output. Cause the wave-image formed to be spread completely across the screen by adjusting the "Horizontal gain" control. The image should be synchronized and made to remain motionless by adjusting the proper oscillograph controls.

3. Adjust the two magnetite core screws of the third I.F. transformer (see radiotron socket voltage and I.F. terminal location diagram) to produce maximum vertical deflection of the oscillograph image. This adjustment places the transformer in exact resonance with the 460 Kc. signal.

4. Set up the cathode ray and test oscillator equipment in the standard manner to provide a frequency modulated signal and a "double trace" image.

5. Adjust the frequency of the test oscillator until the two traces move together and overlap with their highest points exactly coinciding.

6. Now readjust the two magnetite core screws on the third I.F. transformer so as to cause the two traces on the oscillograph screen to coincide throughout their lengths and have maximum amplitude.

7. Without altering the adjustments of the apparatus, shift the "Ant." output of the test oscillator to the control grid cap of the W-6K7 first I.F. radiotron (with grid lead in place), through the .001 mfd. capacitor. Adjust the test oscillator output so that the amplitude of the image is approximately the same as used for adjustment (6) above.

8. The two second I.F. transformer magnetite core screws should then be adjusted so that they cause the forward and reverse traces to become coincident throughout their lengths and have maximum amplitude.

9. Without altering the adjustments of the apparatus, shift the "Ant." output of the test oscillator to the input of the I.F. system; i.e., to the grid cap of the W-6L7 first detector (with grid lead in place) through the .001 mfd. capacitor. Regulate the test oscillator output so that the amplitude of the oscillograph image is approximately the same as used for adjustment (8) above.

10. The two first I.F. transformer magnetite core screws should then be adjusted so as to cause the forward and reverse waves to become coincident throughout their lengths and have maximum amplitude.

11. Note width of oscillographic image at a point which is 50% of maximum amplitude. Turn receiver fidelity control to extreme clockwise position (high fidelity position). Note width of oscillographic image at a point which is 50% of maximum amplitude. Under normal conditions the latter measurement should be approximately 60% greater in width than the former measurement. The image should also appear slightly double humped. These conditions indicate proper broadening of the band width of the I.F. amplifier.

12. Turn range selector to "Medium wave" position and note increase in amplitude. The amplitude should increase several times. It may be necessary to decrease output of test oscillator to keep image on screen.

I.F. ADJUSTMENT WITHOUT CATHODE RAY EQUIPMENT

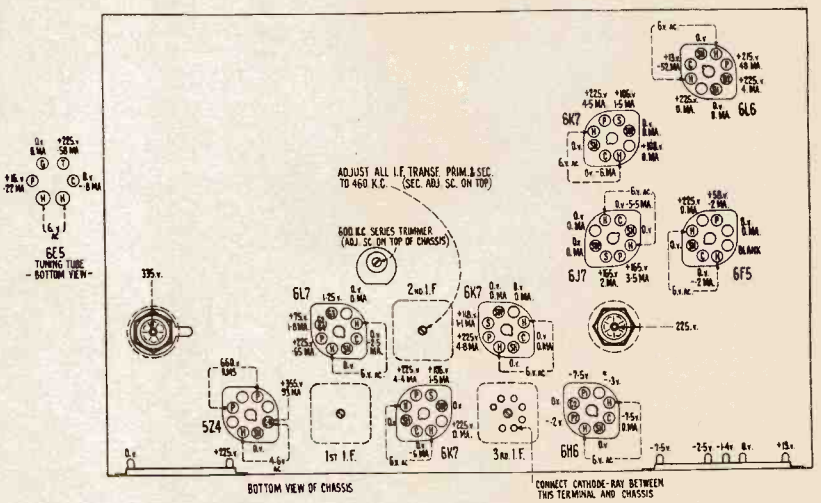
In most cases provided the I.F. transformers have not been very badly put out of adjustment, it is possible to secure reasonably good results by alignment with a simple 460 K.C. audio modulated oscillator and standard output indicator. The adjustment should be made in a similar manner described for the cathode ray equipment, but of, course, the I.F. cores should be adjusted for maximum output indication only. The adjustments must be done in the order given and must be done carefully or unsatisfactory operation of the high fidelity switch will result. No attempt should be made to adjust the I.F. cores with the high fidelity switch in the clockwise or "broad" position.

R.F. ADJUSTMENT

Before attempting R.F. alignment it is necessary to set the pointer in the correct position with relation to the gang condenser plates. This is done by setting the pointer to the angle of the border line of the dial immediately below the 530 K.C. calibration point, with the gang tuning condesner in full mesh.

"Short-Wave" Trimmer Adjustments

Connect the "ANT" output of the test oscillator to the antenna terminal of the receiver through a 400 ohm resistor. Set the receiver range selector switch to its "short wave" position and its dial pointer to 17000 Kc. Adjust the test oscillator to 17000 Kc. Adjust oscillator 17000 Kc. trimmer until maximum output is reached. Two peaks may be found with this circuit. The peak with minimum capacitance (plunger nearly out) should be used. Tighten locknut. Adjust detector 17000 Kc. trimmer until maximum output is reached while slightly rocking the gang condenser. Two peaks may be found with this circuit; the peak with maximum capacitance (plunger nearly in) should be used. Tighten locknut. Adjust antenna 17000 Kc. trimmer until maximum output is reached, while slightly rocking the gang condenser. Two peaks may be found with this circuit; the peak with maximum capacitance (plunger nearly in) should be used. Tighten locknut. Check the image frequency by changing the receiver dial setting to 16,080 Kc. the image signal should be received at this position, indicating that the adjustments have been correctly made. No adjustments should be made while checking for the image signal.

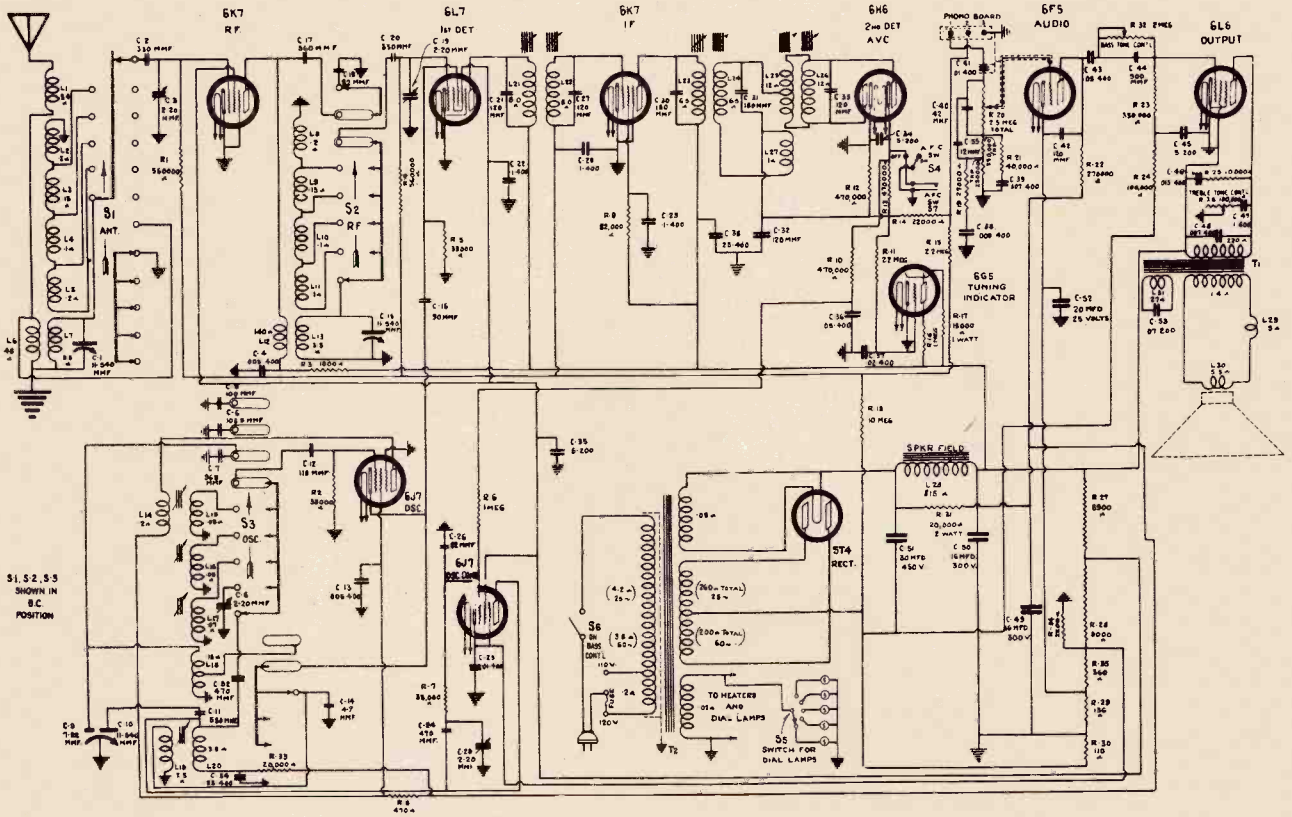


Radiotron Socket Voltages and I.F. Trimmer Locations

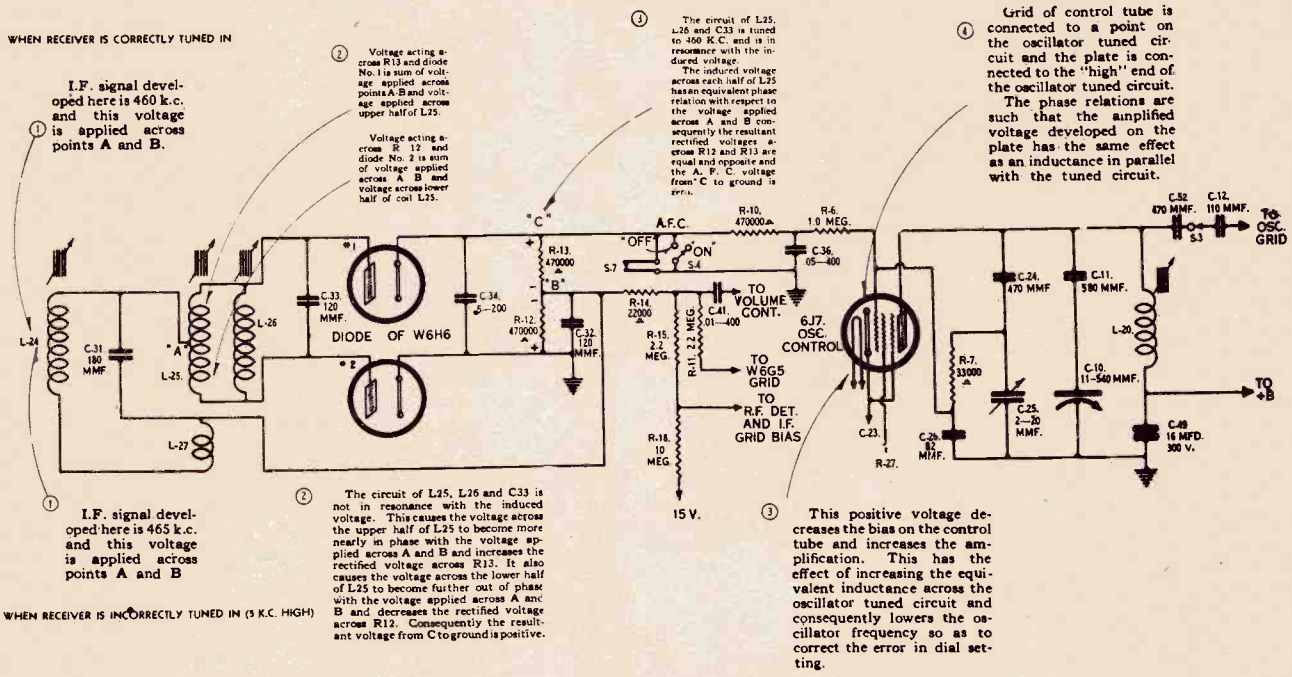
The meter readings given in the diagram are taken with the antenna and ground binding posts short circuited and with 120 volts line. All readings are actual operating conditions and in some cases it will be necessary to allow for meter resistance. All D.C. voltage readings are taken with respect to the chassis frame. All readings are given for normal operation. If readings are taken with a set analyser circuits that are not intended to oscillate, may oscillate, thus increasing plate or screen voltages and decreasing plate or screen current. The set analyser cable may also cause the oscillator radiotron to cease oscillating, thus increasing current and decreasing voltage.

In some cases the socket contacts of "blank" radiotron pins are used as terminals for chassis parts. The voltages shown above on such contacts are circuit voltages, not radiotron voltages.

CANADIAN WESTINGHOUSE MODELS 1029X and 1029Y



Schematic Circuit Diagram



② The circuit of L25, L26 and C33 is not in resonance with the induced voltage. This causes the voltage across the upper half of L25 to become more nearly in phase with the voltage applied across A and B and increases the rectified voltage across R13. It also causes the voltage across the lower half of L25 to become further out of phase with the voltage applied across A and B and decreases the rectified voltage across R12. Consequently the resultant voltage from C to ground is positive.

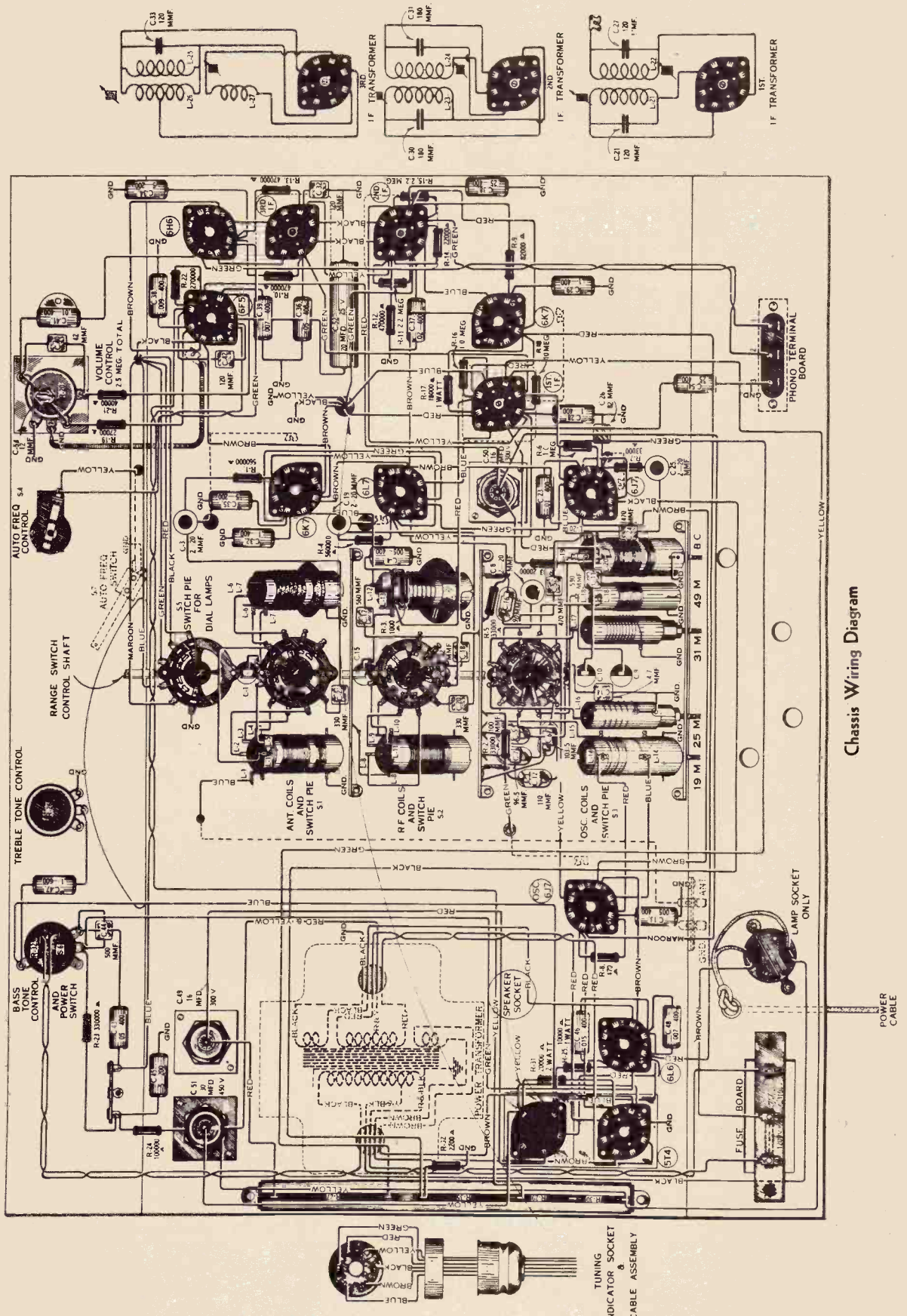
③ This positive voltage decreases the bias on the control tube and increases the amplification. This has the effect of increasing the equivalent inductance across the oscillator tuned circuit and consequently lowers the oscillator frequency so as to correct the error in dial setting.

DETAIL OF AUTOMATIC FREQUENCY CONTROL CIRCUIT

When the receiver is tuned too low, the A.F.C. voltage becomes negative, and results in an opposite corrective effect on the oscillator frequency.

It will be noted that the automatic frequency control is applied to the broadcast band only and that two switches S-4 and S-7 are provided to short circuit the automatic frequency control voltage when its presence is not desired. One switch S-7 is mounted so that by an inward motion while turning the station selector the A.F.C. voltage is removed, thus permitting the station to be tuned without a "dragging" effect that would otherwise exist if the operator attempted to tune past a powerful station to pick up a weaker one.

CANADIAN WESTINGHOUSE MODELS 1029X and 1029Y



ALIGNMENT PROCEDURE

There are various alignment trimmers provided in the detector and oscillator coil tuned circuits. The i-f transformer adjustments are made by means of screws attached to molded magnetite cores. All of these circuits have been accurately adjusted during manufacture and should remain properly aligned unless affected by abnormal conditions or altered during servicing. Loss of sensitivity, improper tone quality, and poor selectivity are the usual indications of improper alignment.

The correct performance of this receiver can only be obtained when the aligning has been done with adequate and reliable apparatus. It is not necessary to use a frequency modulated oscillator and cathode ray oscillograph to align this receiver. Those service men that have this equipment will probably prefer to use it and for their convenience we have indicated on the trimmer location diagram the proper connection point for the cathode ray vertical amplifier input terminal.

A test oscillator is required as a source of the specified alignment frequencies. Visual indication of receiver output during the adjustment is necessary and should be accomplished by the use of an indicator or meter.

The procedure outlined below should be followed in adjusting the various trimmer capacitors and molded cores:

Calibrate the tuning dial by adjusting pointer to the low frequency end of scale with gang condenser plates fully meshed. The pointer may be adjusted along the phosphor bronze drive cable by slackening the stud which secures the glider to the phosphor bronze drive cable.

Perform alignment in proper order as shown by the accompanying chart, starting with No. 1, and following all operations across, then No. 2, etc. The chassis bottom shield must be securely in place when making R.F. adjustments. Adjustment locations and fequencies are shown on a sticker fastened to the bottom side of the chassis shield. These trimmer locations are also shown in one of the accompanying illustrations.

Connect the "low" output terminal of the test oscillator to the receiver chassis for all alignment operations. Regulate the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test oscillator output terminal and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc." means that the receiver should be tuned to a point between 550 and 750 kc. where no signal or interfrence is received from a station or the receiver (heterodyne) oscillator.

The term "Rock Through" indicates that the receiver station selector should be rocked back and forth while making the indicated adjustment. The adjustment and rocking should be continued until the combined action results in the maximum deflection on the output meter.

When adjusting oscillator circuits that have both series and shunt trimmers it is good practice to repeat the adjustment on the oscillator shunt trimmer after making the adjustment on the oscillator series trimmer.

When calibrating the short wave "spread" bands (see operations 6, 9, 10 and 11 in the Alignment Chart), it is necessary to have a very accurate source of test signal. As there are no service oscillators available at present with sufficient accuracy for this calibration adjustment, it is recommended that the respective adjustments to L-16, L-17, L-15 and C-8 be made while listening to a short wave broadcast station of known frequency, approximately in the middle of the band being calibrated. Operations 7 and 8 may be performed after operation 6 by setting the receiver to 11,800 kc. and tuning the test oscillator to the receiver

PRECAUTIONARY LEAD DRESS—(1) All bare bus leads adjacent to the R.F. coils or Range Selector Switch should be as short and direct as possible.

(2) All insulated leads adjacent to the R.F. coils should be dressed away from the coils.

(3) Heater leads should be tightly twisted together and dressed away from grid leads of audio tubes to avoid hum pick-up.

(4) Leads connected to phonograph pick-up terminal should be tightly twisted together and dressed close to chassis frame.

(5) Power output stage grid leads should be dressed away from the high voltage secondary winding leads of power transformer to avoid hum pick-up.

ALIGNMENT CHART

Order of Alignment	Connection To Receiver	Test Oscillator Dummy Antenna	Frequency Setting	Receiver Dial and Range Setting	Master-Manual Sw. Position	Circuit To Adjust	Adjustment Symbols	Adjust to Obtain
1.	Turn this screw all the way out.					A.F.C. I.F.	L 26	
2.	Check with mechanic's scale. This screw should protrude exactly ¼ inch.					A.F.C. I.F.	L 25	
3	W-6K7 I.F. Grid Cap	.001 Mfd.	460 kc.	No signal 550-750 kc.	Manual	2nd. I.F. Transf.	L23, L24	Max. (Peak)
4	W-6L7 First Det.	.001 Mfd.	460 kc.	No Signal 550-750 kc.	Manual	1st. I.F. Transf.	L21, L22	Max.(Peak)
5	W-6L7 First Det.	.001 Mfd.	460 kc.	No Signal 550-750 kc.	Manual	2nd. I.F. Transf.	L23, L24	Max (Peak)
6	Ant. Term.	400 ohms	11,800 kc.	11,800 kc.	Manual	Osc. 25M.	L16	Max (Peak)†
7	Ant. Term.	400 ohms	11,800 kc.	11,800 kc.	Manual	Det. 25M.	C19	Max (Peak)**
8	Ant. Term.	400 ohms	11,800 kc.	11,800 kc.	Manual	Ant. 25M.	C3	Max (Peak)**
9	Ant. Term.	400 ohms	9,600 kc.	9,600 kc.	Manual	Osc. 31M.	L17	Max (Peak)†
10	Ant. Term.	400 ohms	15,200 kc.	15,200 kc.	Manual	Osc. 19M.	L15	Max (Peak)†
11	Ant. Term.	400 ohms	6,100 kc.	6,100 kc.	Manual	Osc. 49M.	C8	Max (Peak)*
12	Ant. Term.	200 mmfd.	1,500 kc.	1,500 kc.	Manual	B.C. H.F. Osc.	C25	Max (Peak)**
13	Ant. Term.	200 mmfd.	600 kc.	Rock Through 600 kc.	Manual	B.C. L.F. Osc.	L20	Max (Peak)
14	Repeat 12							
15	Repeat 13							
16	Repeat 12							
17	See instructions below for A.F.C. Alignment						L26.	

* If two peaks obtainable use higher capacity setting.

** If two peaks obtainable use lower capacity setting.

† If two peaks obtainable use lower inductance setting (screw further out).

ALIGNMENT PROCEDURE FOR A.F.C. I.F. TRANSFORMER

In the alignment chart the first adjustment given is to turn the A.F.C. I.F. transformer tuning screw in coil L-26 all the way out so that the normal alignment adjustment may be made independently. It is convenient at the same time to check the centering of the core in coil L-25. This is not an adjustment for tuning purposes, but merely to obtain equal inductance in each half of coil L-25 by accurately adjusting the magnetite core to the centre of the coil.

The final adjustment to tune the A.F.C. I.F. transformer to resonance with the other I.F. transformers is as follows:

1. Using a standard antenna, and leaving the master-manual switch in the manual position, tune in a powerful station, preferably a local, very accurately, using the tuning indicator to secure exact resonance.

2. With the test oscillator set and connected exactly the same as in the fourth operation of the alignment chart feed a 460 K.C. signal into the first detector. If the proper adjustments have been made there should be a very low pitched beat note in the loud speaker.

3. Slightly readjust the test oscillator frequency to secure lowest frequency, or "zero beat" in the reproducer.

4. Turn the master-manual switch to the "master" position. This will immediately change the frequency of the heterodyne oscillator in the receiver and cause the beat note in the reproducer to become fairly high in pitch.

5. Adjust the magnetite core screw in coil L-26 until "zero beat" is again obtained in the reproducer output.

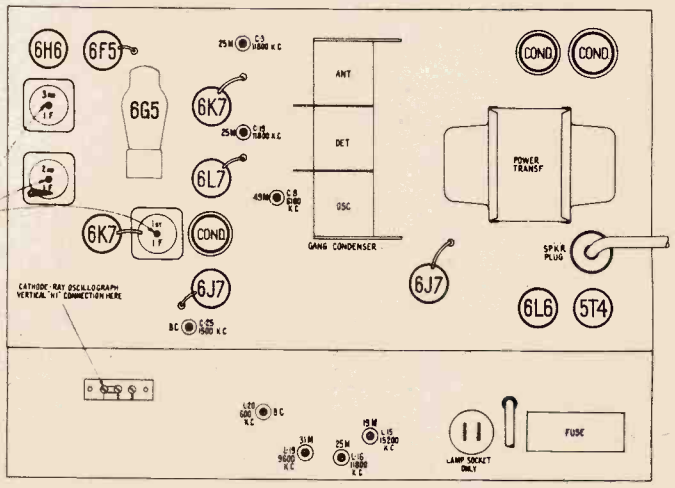
The A.F.C. I.F. transformer is now correctly tuned and switching the "manual-master" switch back and forth should produce no change in the reproducer output,

To check the operation of the A.F.C. circuit disconnect the test oscillator, set the "master-manual" switch at "manual" and tune the receiver approximately 5 K.C. away from a fairly strong signal. The quality of reception will, of course, be poor and noisy. Turn the master-manual switch to the "master" position. The reception should immediately improve and correspond to that obtainable from the same station when accurately tuned to resonance.

Trimmer Locations

AT RIGHT » »

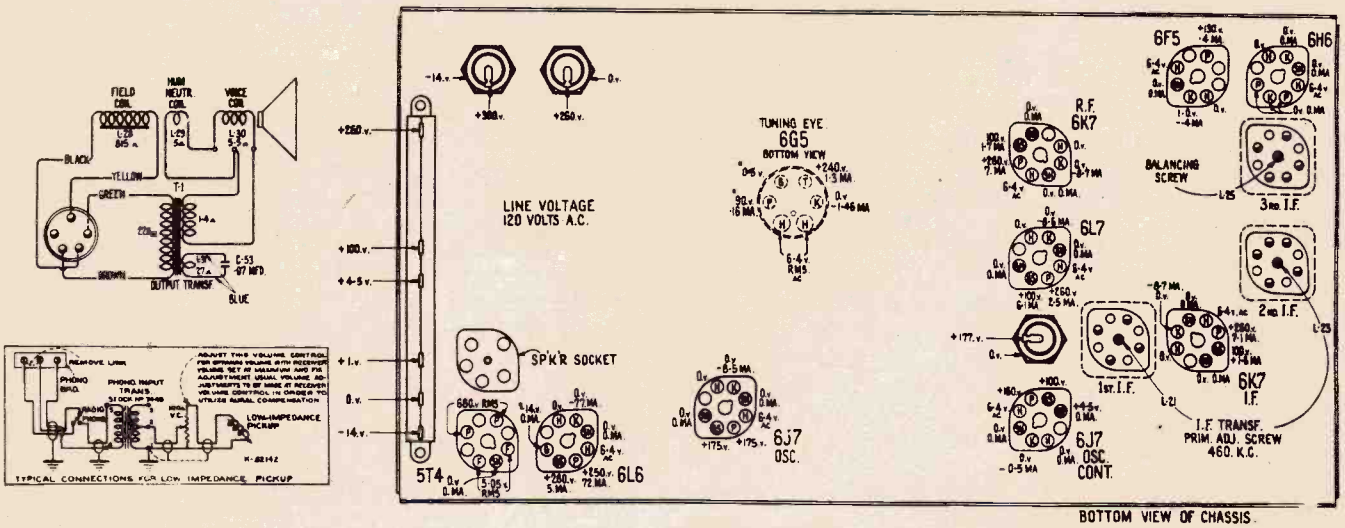
(also see Socket Meter Reading Diagram)



Socket Meter Readings

BELOW

The meter readings given in the diagram are taken with the antenna and ground binding posts short circuited and with 120 volts line. All readings are actual operating conditions and in some cases it will be necessary to allow for meter resistance. All D.C. voltage readings are taken with respect to the chassis frame. All readings are given for normal operation. If readings are taken with a set analyser, circuits that are not intended to oscillate, may oscillate, thus increasing plate or screen voltages and decreasing plate or screen current. The set analyser cable may also cause the oscillator radiotron to cease oscillating, thus increasing current and decreasing voltage.



OTHER CHANGES

A.F.C. Alignment—Somewhat better results will be secured if in operation No. 1 (see chart) the core screw is turned almost all in instead of all out as a greater amount of detuning is possible.

Length of Drive Cable should be 45¼ inches.

SHORT WAVE CALIBRATION
WESTINGHOUSE MODELS 1029-X, 1029-Y AND 1230-X

We have found that, during shipment, it is possible for the oscillator control grid lead in these receivers to shift sufficiently to throw the short wave dial scales somewhat out of calibration. When this occurs, the calibration on all short wave bands will usually be found to have shifted in the same direction, that is, all four dial scales will be high or all four dial scales will be low.

If such a condition is found, it will be a simple matter to correct it by rotating the oscillator control grid clip so as to change the position of the flexible lead, checking the calibration on the short wave bands while this is being done until the calibration is accurate within 5 K.C.

DO NOT LOOSEN THE CHASSIS MOUNTING BOLTS ON WESTINGHOUSE MODEL 1230-X

Contrary to instructions attached to radio receivers from early production, these chassis mounting bolts should not be loosened, as due to the slope of the chassis shelf, the chassis may sag on the rubber cushion sufficiently to interfere with proper operation of the pushbuttons. When it is necessary to remove a chassis for servicing, the service man should be careful to replace the chassis as far forward as possible in the cabinet and hold it in place while tightening the chassis mounting bolts and checking the pushbutton operation.

INSTRUCT YOUR CUSTOMERS IN THE PROPER OPERATION OF THE REMOTE CONTROL USED WITH MODEL 1230-X

Lack of proper instructions at the time of sale may result in unnecessary service calls; for instance, the customer may call up and say that a Model 1230-X is dead; "he has tried all the controls and can't hear a sound." The trouble may only be that the toggle switch on the remote control has been turned to the "Off" position. The customer may forget this and attempt to operate the set the next time from the front of the cabinet and wonder why no sound is heard.

If two or more buttons on the remote control are left pressed down and then the customer attempts to operate the receiver by the buttons on the front of the cabinet, the tuning motor will operate continuously if any of the buttons on the front of the cabinet corresponding to the down button on the remote control are pressed. A similar result will be obtained if two or more buttons on the front of the cabinet are left pressed down and the customer attempts to operate the receiver by remote control.

Another possible condition is as follows: Assume that the controls have been correctly set and a station, WJR, tuned in by the remote control. Customer may leave control set at this position and turn the operating switch off; the next time he operates the receiver he may attempt to do so by the pushbuttons on the front panel, neglecting to turn the "Manual, Button, Remote, Master" control to the "Button" position.

If the panel button also happens to be pressed for the same station, WJR, and another button is then pressed, there may be an instant when the switch corresponding to the WJR panel button and the other panel button switch are both making contact. This contact may last long enough to start the motor going but the tuning mechanism will continue until WJR is tuned in again instead of the station the customer is trying to get incorrectly.

These conditions will be perfectly understood by a study of the wiring diagram of the electric tuning and being familiar with them, you may be able to save yourself making unnecessary service calls by explaining to the customer over the 'phone the proper method of operation.

OSCILLATOR INOPERATIVE ON STANDARD BROADCAST BAND OF WESTINGHOUSE MODEL 1230X

This condition may extend over the whole band or only over the lower half of the band. A possible cause is a poor contact between the aluminum post and the terminal lugs of one of the electrolytic condensers. This lug may appear to be clamped tight but an imperfect contact may exist due to a film of resin. The remedy is to replace the electrolytic or remove it and repair it. This condition has only been observed on Westinghouse Model 1230X but may show up on other receivers.

CALIBRATION SHIFT ON STANDARD BROADCAST BAND OR 49 METER BAND OF WESTINGHOUSE MODEL 1029 and 1230

This may be due to an imperfect contact of the wire lead to the moulded frame of one of the air dielectric trimmers. This condition may be corrected by soldering.

WESTINGHOUSE MODEL 1230X

ELECTRIC TUNING

Principle of Operation

The electric tuning mechanism consists essentially of a quick engaging and dis-engaging reversible electric motor, tuning condenser driving gear train, and eight mechanically interlocked (pushing one button releases all others) station selector push buttons respectively wired to eight adjustable station selector contactor discs (each with a motor stopping insulated segment) mounted on a drum which is direct-coupled to the gang tuning condenser shaft. The arrangement permits any one of eight pre-determined stations to be electrically tuned in by merely touching the correct push button.

The operation may be more readily understood by reference to figures 1, 5, and 6. When the motor is not energized, the armature is pushed to the rear or slightly out of the magnetic center by tension of contact spring "C" and the motor shaft is dis-engaged from the driving gear train. Pressing in any one of the eight push buttons will complete the motor circuit through a station selector contactor disc, assuming that the A.F.C. and Motor Control is in "Electric" position and that the insulated segment in the contactor disc is not opposite its contactor. As the motor starts, the armature will be drawn forward, due to solenoid action, and the pin "F" on the end of its shaft will engage the arm "G" on the small main pinion gear, thereby driving the tuning mechanism. At the same time contact springs "E" and "D" (S11) will be grounded, causing suppression of audio amplification and automatic frequency control during the tuning cycle. The motor will contunue to operate until the insulated segment in the selector disc breaks the motor circuit, whereupon spring "C" will instantly dis-engage the motor pin "F" from the arm "G" on the small pinion driving gear and open contacts "E" and "D". Pushing another button will cause the above mentioned cycle to be repeated except that the motor will be interrupted by the insulated segment on a corresponding disc. The discs are individually adjustable on a drum mechanism, providing a choice of eight "Electric Tuned" stations. The arrangement of the motor is such that its rotation will continue in the same direction regardless of the number of "Electric" tuning cycles until the tuning condenser approches either full out or full in of mesh whereupon lever "H" trips switch S9 whichr everses the direction of rotation. A throw-out idler gear is link-coupled to the A. F. C. and Motor control to disconnect the motor drive gear train when the control is thrown to "Manual" or "Master" position.

Mechanism Adjustments

The electric tuning mechanism is designed to be as simple in construction and as fool proof in operation as is possible. In order to maintain the accurate results possible with this device care must be taken in effecting any repairs or adjustments. Reference should be made to figure 5 and the following:

A-F-C and A-F Amplification Suppression Switches.- This switch assembly is located on the motor bracket and closes due to solenoid action of motor armature. The tension of the long contact spring "C" is important in bringing about quick dis-engagement of the motor and in permitting the motor to pull into mesh with the drive mechanism. Normal adjustment is attained when the short springs "D" and "E" are aligned exactly straight with contact points separated approximately 1/32 of an inch and with the spring "C" spaced approximately 7/32 of an inch from spring "D" at the point of contact. If necessary, in order to obtain positive pull-in and quick dis-engagement of the motor, the tension of spring "C" should be increased or decreased by bending. This action should be checked with the front of the chassis raised two inches higher than the rear. Contacts of the switch must be kept clean. Crocus cloth or a relay burnisher may be used for this purpose.

On all but a few of the first production of 60 cycle motors an additional adjustment is possible to secure positive pull-in of the motor. A flat phosphor bronze spring is mounted at the rear of the motor and exerts a pressure (which may be varied by bending) on the end of the motor shaft.

A relay bending tool equivalent to the Automatic Electric Company, Chicago, Illionis, tool No. 7066, will be found handy in bending the fingers of the switch for proper adjustment. This tension adjustment may have to be changed to secure proper operation on low line voltages; the lower the voltage the less should be the tension of the switch finger against the rotor shaft.

RELAY BENDING TOOL

Motor Reversing Switch.—It is necessary to automatically stop and reverse the drive motor before the tuning condenser reaches the end of its travel. Approximately 175 degrees of sweep is required, and the reversal must take place above 1,700 kc and below 540 kc but not too near the limits of the scale. The coupling between the station selector drum and the tuning condenser shaft should be attached so that the reversing switch trip lever "H" is exactly vertical when the condenser is full-out of mesh. There should be 1/32 of an inch clearance between the end of the condenser shaft and the selector drum shaft. While the trip lever is in this position the reversing switch bracket should be adjusted by means of its elongated mounting holes until the switch pin "I" just lightly touches trip lever "H."

Main Pinion Gear.—Clearance between the small high-speed pinion gear "E" and the intermediate gear "K" determines the amount of mechanical noise produced. Correct adjustment will give approximately 1/32 of an inch movement of back lash at the end of pinion arm "G" when gear "K" is held stationary. Arm "G" must also be adjusted for correct mesh with motor shaft drive pin "F". With the motor shaft completely forward and pinion "E" tight against its front bearing, the pinion mounting stud "J" should be adjusted so that pin "F" meshes its full thickness with the rotating arm "G." An increase of this mesh will increase over travel on tuning while a decrease of mesh will decrease the over travel. The elongated hole in the front bracket allows sufficient movement of the mounting stud "J" to permit above mentioned gear mesh adjustment.

A.F.C. and Motor Control.—(1) Link and lever adjustment. By loosening the set screws holding the link lever on the switch shaft, an adjustment can be obtained so that the throwout gear (M) has at least 1/16" clearance with respect to intermediate gear (L) when the control is in either the Manual or Master position.

(2) Throw-out Gear Adjustment—To obtain smooth operation on "Electric" or "Remote" positions it is important that the proper clearance is maintained between the throw-out gear "M" and the intermediate gear "L." With the control thrown to "Remote" position, adjust the mesh between these gears by means of the eccentric screw "O" and lock nut "P" on the throw-out gear bracket "MM" until there is approximately 1/64 of an inch backlash of gear "L" when gear "M" is held stationary.

3. If there is a tendency for the throw-out gear "M" to come out of mesh in either direction of rotation, this may be corrected by increasing the tension on spring "N" or replacing this spring or by relieving any binding of the lever to which the throw-out gear is attached. Binding of this lever may occur at the bearing on the tuning shaft assembly. The bearing of the lever should be carefully washed out with Carbona of equivalent, and re-oiled plentifully. Work the lever back and forth while cleaning and oiling so that any foreign particles will be removed.

Replacing Gear Train.—It should be replaced by sliding anti-backlash gear "R" on condenser shaft apart so that compression amounting to one tooth on the gear is obtained in the springs. Adjust mesh of gear "R" with pinion gear "U" on vernier shaft before tightening screws "S" so that smooth tuning is obtained throughout the range.

Motor Alignment.—The motor shaft must be exactly aligned with the axis of the pinion gear with which it engages. This may be adjusted by loosening the mounting screws "V" of the motor and aligning shaft by sight. Correct alignment may be tested by slowly rotating motor and observing the relation between the pin "F" of the motor shaft and the arm "G" on the pinion. The relation of the two should remain the same throughout the revolution. Additional movement for adjustment may be obtained by the motor bracket screws "W" if necessary.

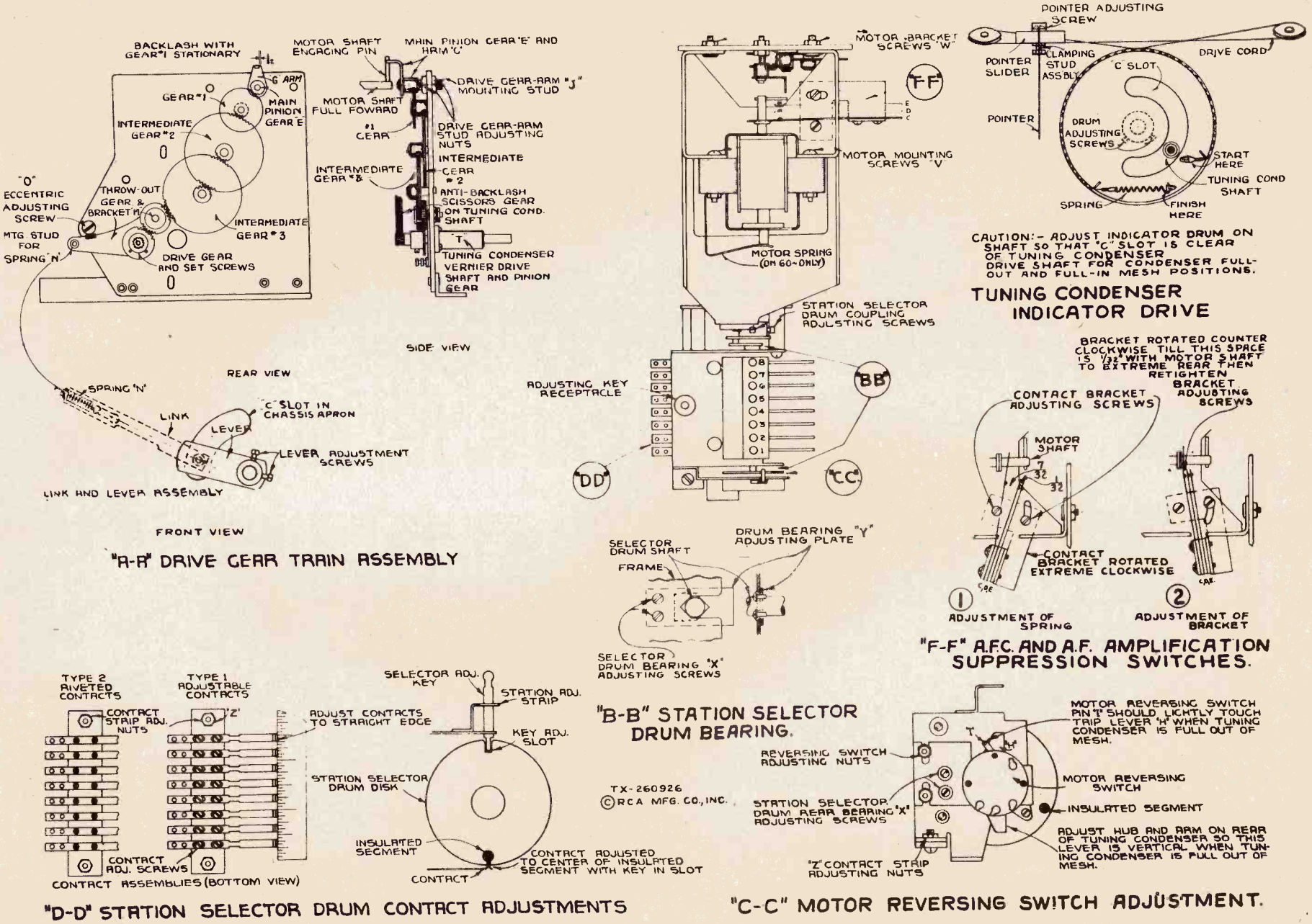


Figure 5— ELECTRIC TUNING MECHANISM ADJUSTMENTS

Station Selector Drum.—(1) Bearing Adjustment—The selector drum may be removed by unscrewing the two bearing adjusting screws "X" on the front and rear bearings and sliding shaft out of slots on frame. To replace drum, the reverse procedure should be followed holding bearing adjusting plates "Y" firmly against the shaft and tightening adjusting screws. (2) Contact adjustment—Two types of contact strips are used They are designated on figure 5, as types 1 and 2, on which the individual contacts are respectively adjustable and fixed. In type 1, the individual contacts should be adjusted by setting the end contact springs near the mid-position of their travel and aligning the remaining springs to them by means of a straight edge. Either type of contact strip should be adjusted to the selector drum by placing two selector adjusting keys in the station adjustment strip, positions 1 and 8, loosening contact strip adjusting nuts "Z" and shifting the contact strip until the end contacts are exactly centered on the respective disc insulating segments. More accurate adjustment may be made by silhouetting the point of contact with a piece of white paper held behind the contact. Adjustment will be facilitated by removing complete assembly rear of tuning condenser by unscrewing the three mounting screws. Contacts and discs must be kept free of dirt, filings, and other extraneous matter.

Arcing at the insulating segments of the selector discs will produce a bad interference during "Electric" tuning but which will not be present during "Manual" tuning The condition will in most cases be due to an accumulation of metallic dust, or graphite grease on the discs. Thorough cleaning of the discs with a cloth and cleaning fluid, polishing with crocus cloth and careful re-lubrication will eliminate the trouble.

Lubrication.—The dial pointer slide should be greased with petrolatum. This same lubrication should be applied lightly to all gear faces of the drive mechanism and sparingly with a cloth to the station selector discs. Any good household oil, such as "3-IN-ONE," is suitable for the motor shaft bearings. A light grade of engine oil should be used for all gear bearings, Medium viscosity engine oil, similar to "PYROIL" (B), should be applied between the thrust washers on the motor shaft. "CASTORDAG," a mixture of graphite and castor oil, is recommended for use at the selector drum end-bearing slots and at the bearings of cable pulleys.

Motor slips in and out of Mesh and appears to be overloaded.

In the foregoing paragraphs are described several adjustments and conditions, which if abnormal, will result in failure of the motor to operate properly. It will also be obvious that any friction condition that causes the motor to become overloaded may also result in the motor dropping out of mesh. Some of these other causes are:

1. Friction between the large tuning knob and the cabinet or the inner knob.
2. The slider of the dial pointer may be hitting a burr on its guide channel.
3. Condenser rotor contact springs may be too tight.

Station Adjustment

Any 8 stations may be controlled by the Buttons. Cut labels for the particular station desired and insert the labels in the Buttons with the small celluloid "windows" in front. Turn the power on and proceed to set up the "electric" tuning as follows:

1. Set Range Selector to "Broadcast."
2. Turn A.F.C. and Motor control to Button.
3. Turn Fidelity control counter-clockwise.
4. Press push button No. 1 and wait until station pointer comes to rest.
5. Turn the A.F.C. and Motor control to "Manual."
6. Remove adjusting key from receptacle on top of station selector drum mechanism.
7. Insert key in position marked, "1" in station adjustment strip and push the key all the way down to properly fit in slot in disc.
8. Tune the receiver very carefully by means of the manual tuning knob and the "Magic Eye," to station chosen for No. 1.
9. Remove key.
10. Turn the A.F.C. and Motor control to "Button."

Button No. 1 is now properly set for "Electtic" tuning. Proceed similarly for the other seven push buttons, matching each station on the dial with the same number on the station adjustment strip. Repeat the above steps but place the key respectively in positions 2, 3, 4, etc., and in each case tune to the proper station. Now when you press a button the desired station will be tuned in electrically.

It is possible to set the mechanism to tune in electrically short wave stations as well as standard broadcast stations but the same stability of adjustment cannot be expected as there is no A.F.C. action on the short wave bands.

Ordinarily, stations separated by 10 kc may be set up and tuned electrically. It is not very wise however, to attempt to set up a weak station for electric tuning on a channel adjacent to a strong station, unless the station is of sufficient strength to actuate the A.F.C.

If two Buttons are pressed simultaneously, they will both lock in position, the motor will never become open circuited at the selector drum and the motor may continue to operate as long as the radio is turned on. Pressing any one other Button will release the locked Buttons and permit normal pushbutton operation.

If all eight Buttons should be locked in position simultaneously (this is a possible but unlikely occurance), the same thing will happen but normal operation may be restored by exerting strong pressure on Button No. 8.

Armchair Control

When a S No. H-38205 Remote Control is attached to the receiver as shown in Figure 6, it duplicates the action of the pushbuttons on the front panel when the A.F.C. and Motor Control is turned to the "remote" position. A S.P.S.T. switch which is

Reference to Figure 6 will show that buttons No. 4 and No. 5 on the arm chair control are marked with an asterisk. If due to experimenting on part of the owner, all eight buttons on the control are simultaneously pressed in position, the condenser drive motor will operate back and forth continuously as long as the radio operating switch is on and the A.F.C. and Motor control is in the "remote" position, unless either button No. 4 or button No. 5 is pressed firmly, allowing of all the other buttons to release.

mounted on the Remote Control permits the operator to open circuit the reproducer voice coil without walking over to the radio receiver.

Extra lengths of control cable may be used if it is desired to have the Remote Control at a greater distance. This should not be done, however, where, the power line voltage is low as the added voltage drop in the cable circuit will reduce the power of the drive motor and prevent correct operation.

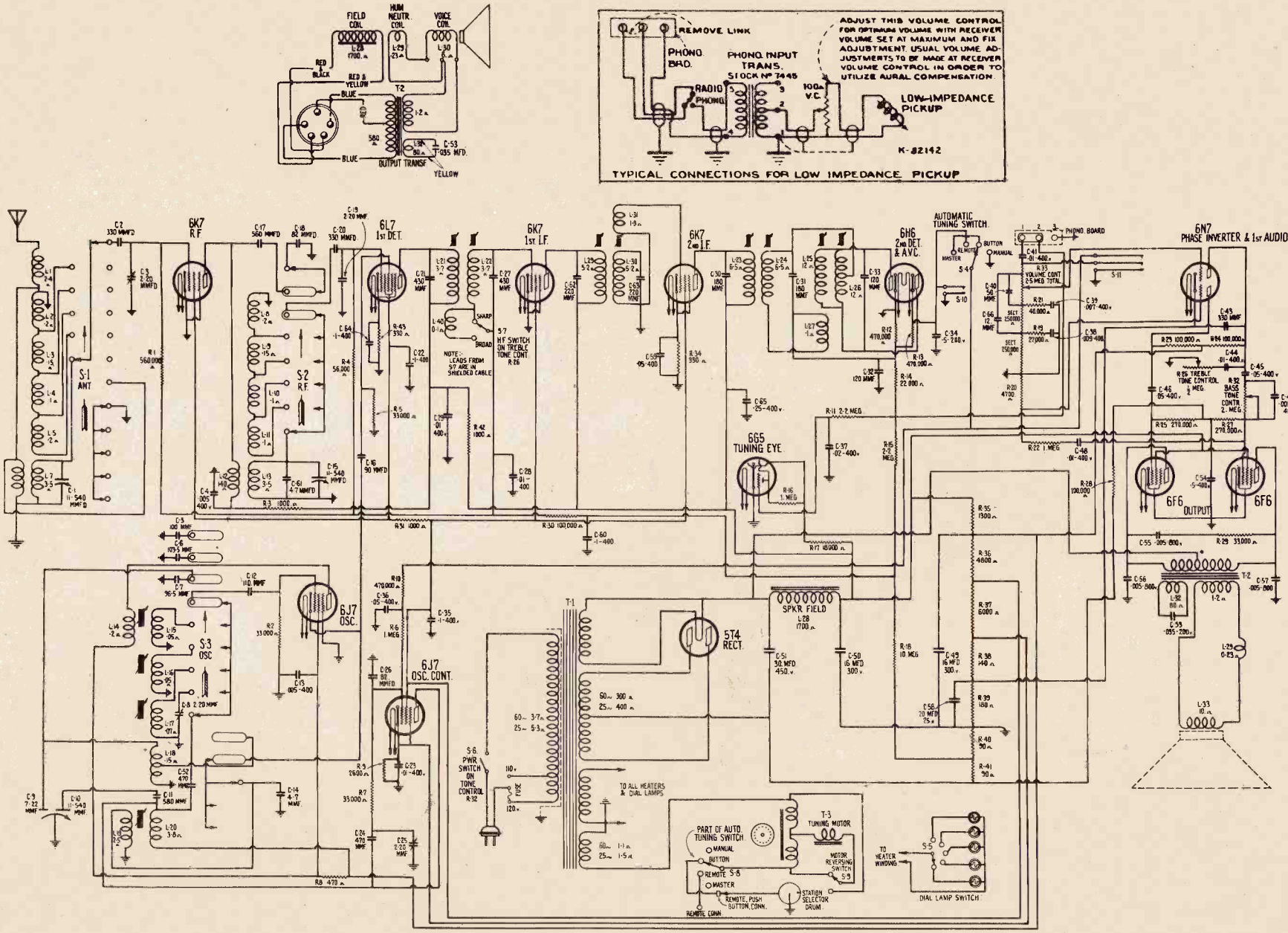


Figure 1.—Schematic Circuit Diagram with Reproducer and Phonograph Pick-up Connections

WESTINGHOUSE MODEL 1230X

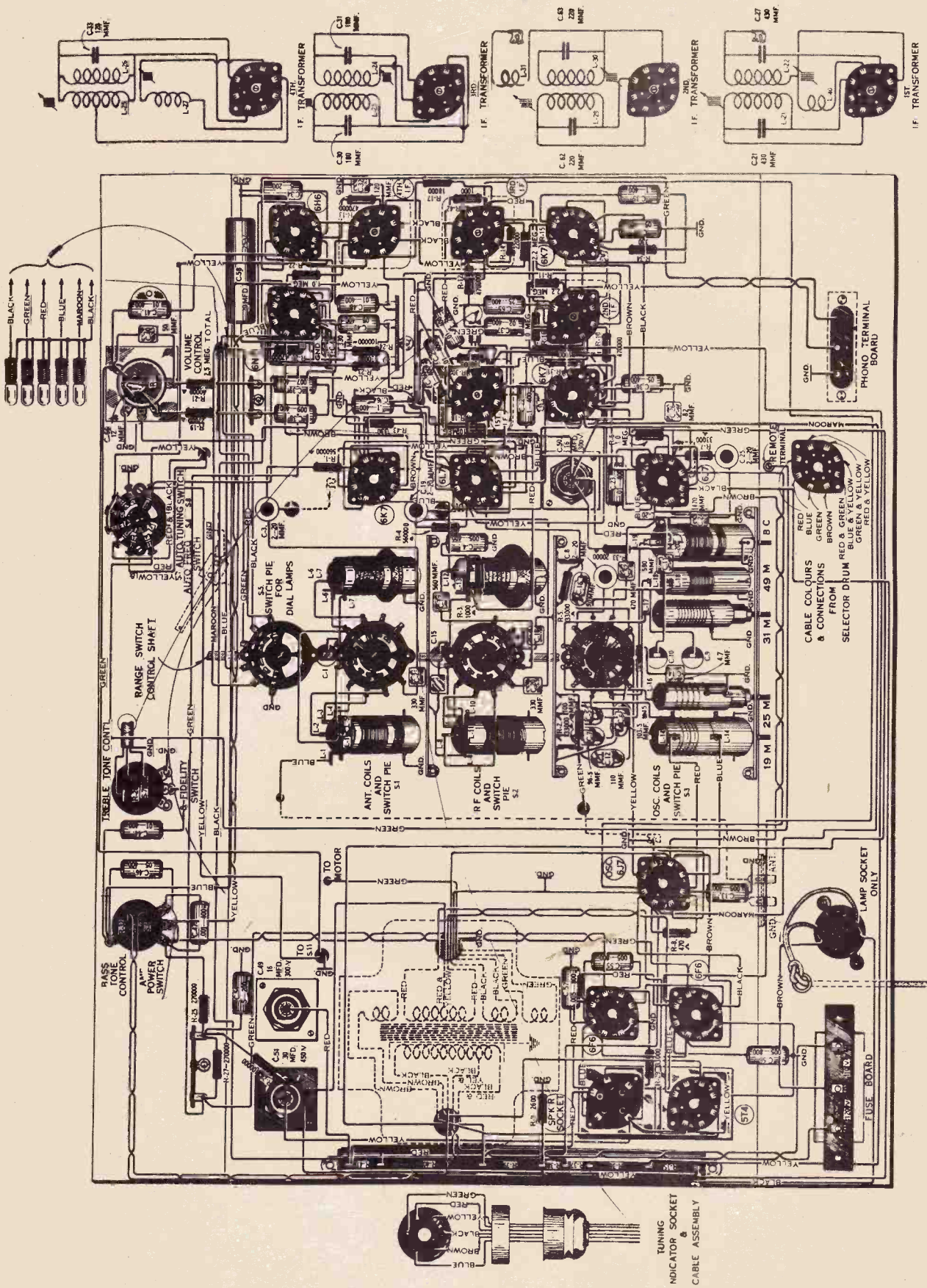


Figure 2— CHASSIS WIRING DIAGRAM

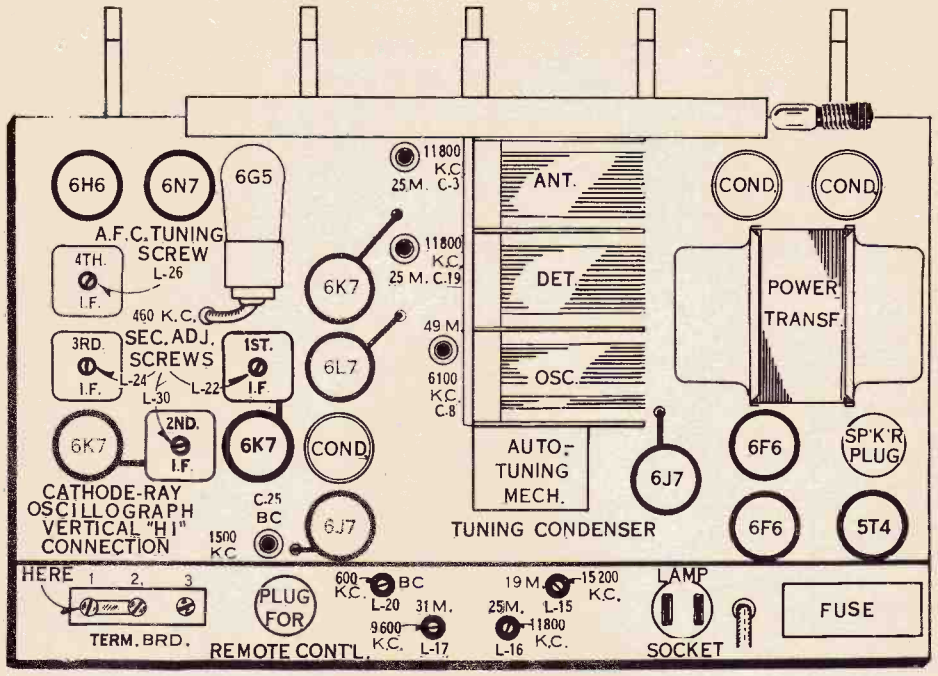


Figure 3—TRIMMER LOCATIONS

(also see Socket Meter Reading Diagram)

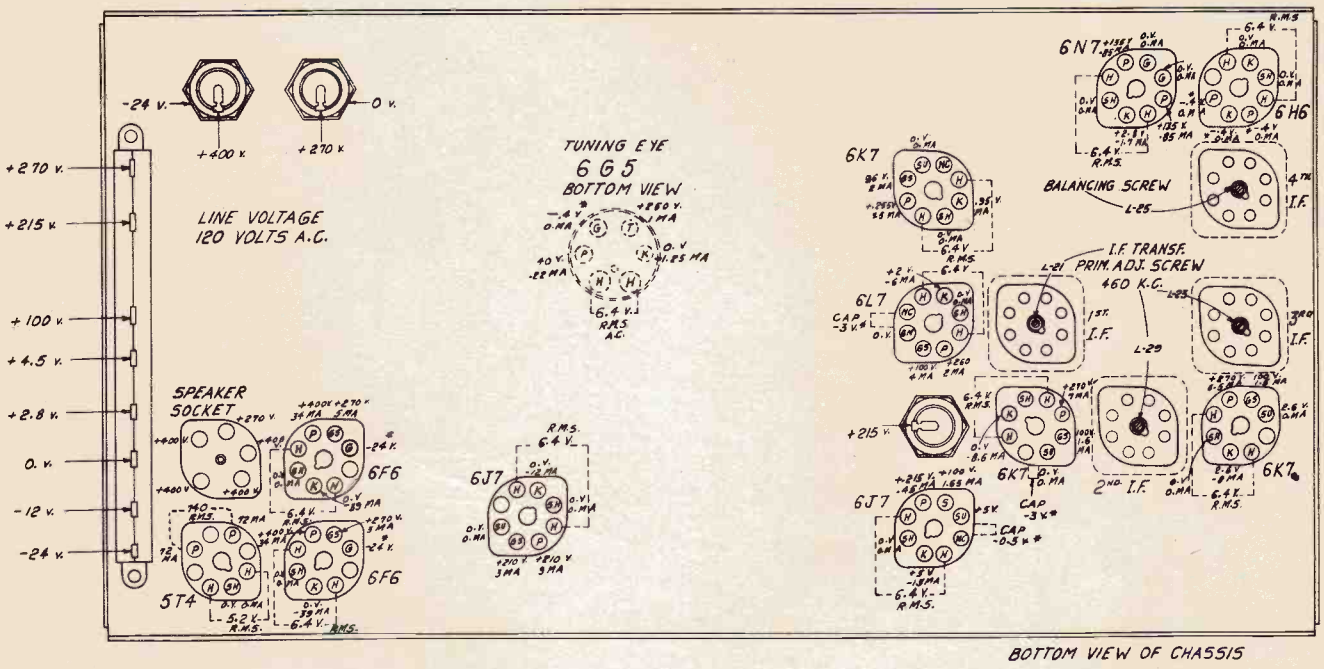


Figure 4—SOCKET METER READINGS

The meter readings given in the diagram are taken with the antenna and ground binding posts short circuited and with 120 volt line. All readings are actual operating conditions and in some cases it will be necessary to allow for meter resistance. All D.C. voltage readings are taken with respect to the chassis frame. All readings are given for normal operation. If readings are taken with a set analyser, circuits that are not intended to oscillate, may oscillate, thus increasing plate or screen voltages and decreasing plate or screen current. The set analyser cable may also cause the oscillator radiotron to cease oscillating, thus increasing current and decreasing voltage.

ALIGNMENT CHART

Only the alignment chart and trimmer location diagrams are shown here. Some very important information on alignment procedur e is given in Radio Service Manual Section RS-181 covering Westinghouse Model 1029. This should be referred to before performing the alignment operations.

Alignment by cathode ray oscillograph and frequency modulated oscillator is desirable on this receiver as it uses a high fidelity (bandpass) I.F. amplifier. All of the adjustments in the alignment chart should be performed with the high fidelity switch (S7) on the treble tone control in the selective or counter-clockwise position.

Order of Alignment	Connection To Receiver	Test Oscillator Dummy Antenna	Frequency Setting	Receiver Dial and Range Setting	A.F.C. and Motor Control Position	Circuit To Adjust	Adjustment Symbols	Adjust to Obtain
1.	Turn this screw nearly all the way in.					A.F.C. I.F.	L 26	
2.	Check with mechanic's scale. This screw should protrude exactly $\frac{1}{4}$ inch.					A.F.C. I.F.	L 25	
3	W-6K7 2nd I.F Grid Cap	.001 Mfd.	460 kc.	No signal 550-750 kc.	Manual	3rd. I.F. Transf.	L23, L24	Max. (Peak)
4	W-6K7 1st I.F. Grid Cap	.001 Mfd.	460 kc.	No Signal 550-750 kc.	Manual	2nd. I.F. Transf.	L29, L30, L31	Max.(Peak)
5	W-6L7 Det. Grid Cap	.001 Mfd.	460 kc.	No Signal 550-750 kc.	Manual	1st. I.F. Transf.	L21, L22	Max (Peak)
6	Ant. Term.	400 ohms	11,800 kc.	11,800 kc.	Manual	Osc. 25M.	L16	Max (Peak)†
7	Ant. Term.	400 ohms	11,800 kc.	11,800 kc.	Manual	Det. 25M.	C19	Max (Peak)**
8	Ant. Term.	400 ohms	11,800 kc.	11,800 kc.	Manual	Ant. 25M.	C3	Max (Peak)**
9	Ant. Term.	400 ohms	9,600 kc.	9,600 kc.	Manual	Osc. 31M.	L17	Max (Peak)†
10	Ant. Term.	400 ohms	15,200 kc.	15,200 kc.	Manual	Osc. 19M.	L15	Max (Peak)†
11	Ant. Term.	400 ohms	6,100 kc.	6,100 kc.	Manual	Osc. 49M.	C8	Max (Peak)*
12	Ant. Term.	200 mmfd.	1,500 kc.	1,500 kc.	Manual	B.C. H.F. Osc	C25	Max (Peak)**
13	Ant. Term.	200 mmfd.	600 kc.	Rock Through 600 kc.	Manual	B.C. L.F. Osc.	L20	Max (Peak)
14	Repeat 12							
15	Repeat 13							
16	Repeat 12							
17	See instructions in Radio Service Manual Section RS181 for A.F.C. Alignment.						L26	

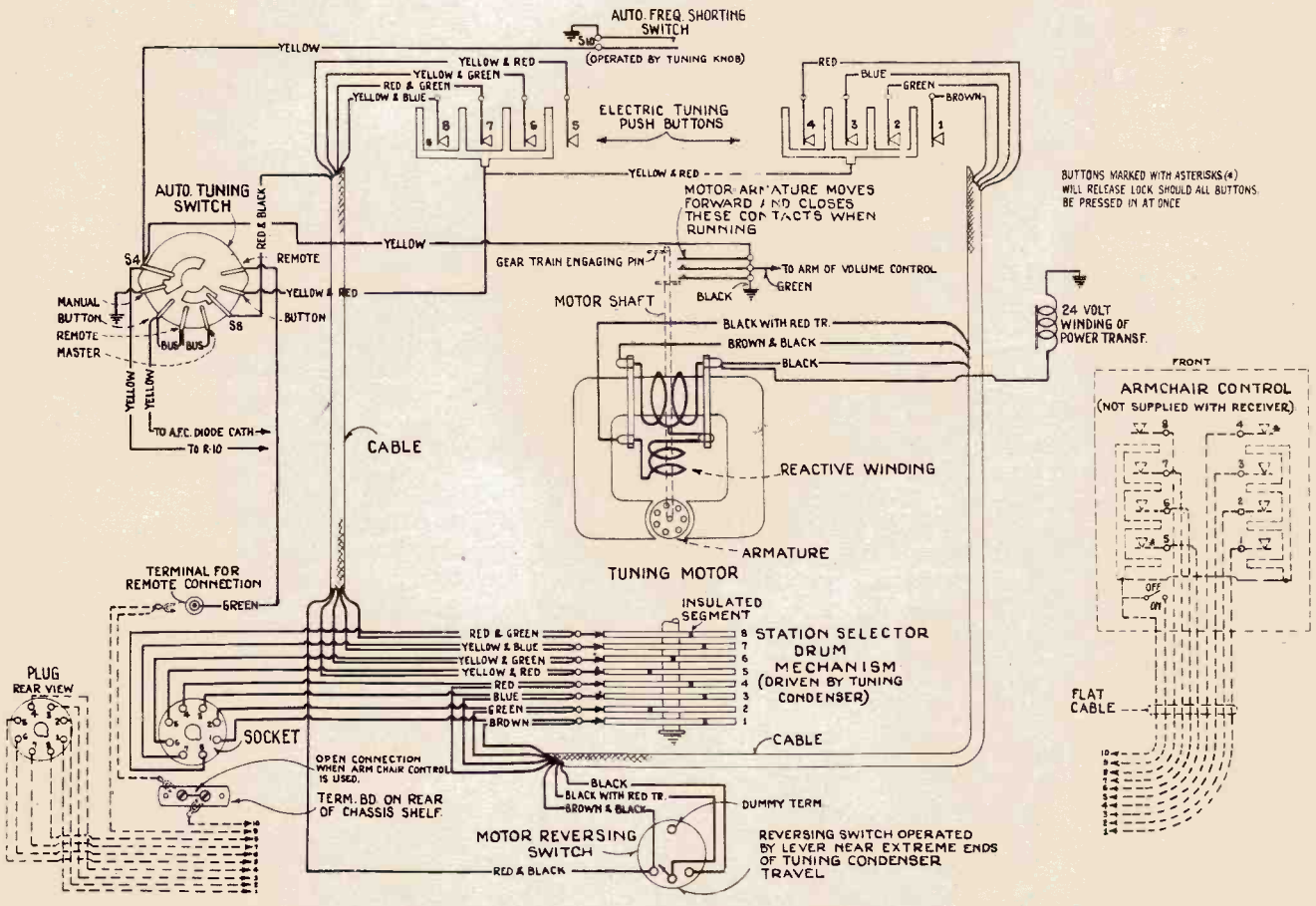
* If two peaks obtainable use higher capacity setting.

** If two peaks obtainable use lower capacity setting.

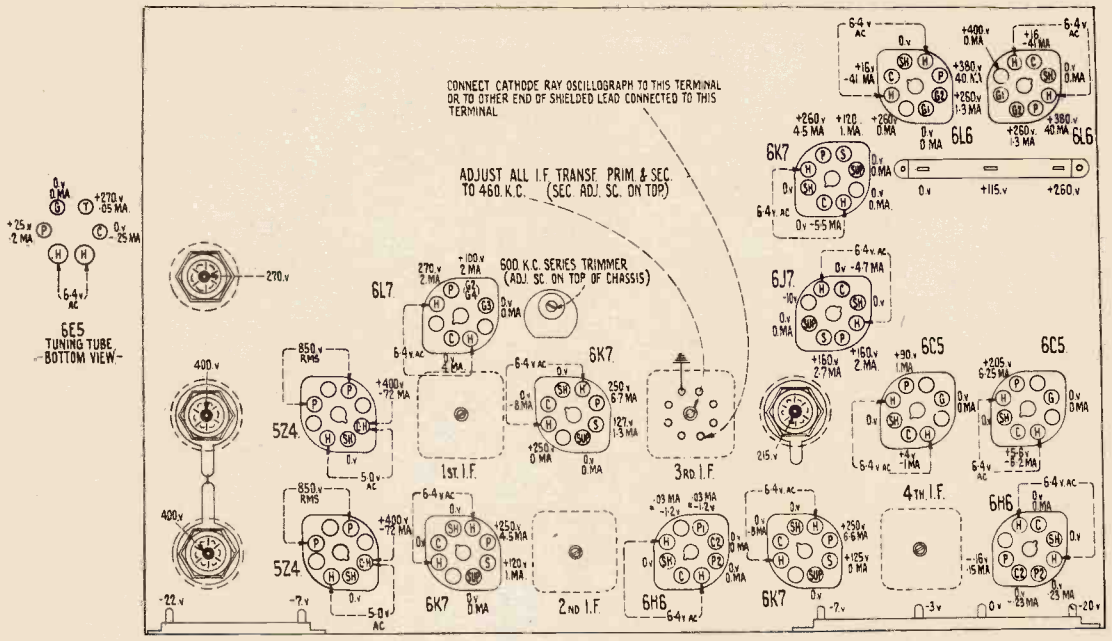
† If two peaks obtainable use lower inductance setting (screw further cut

Figure 6—

ELECTRIC TUNING WIRING DIAGRAM



WESTINGHOUSE MODEL W-1516X



BOTTOM VIEW OF CHASSIS.

I.F. Amplifier:

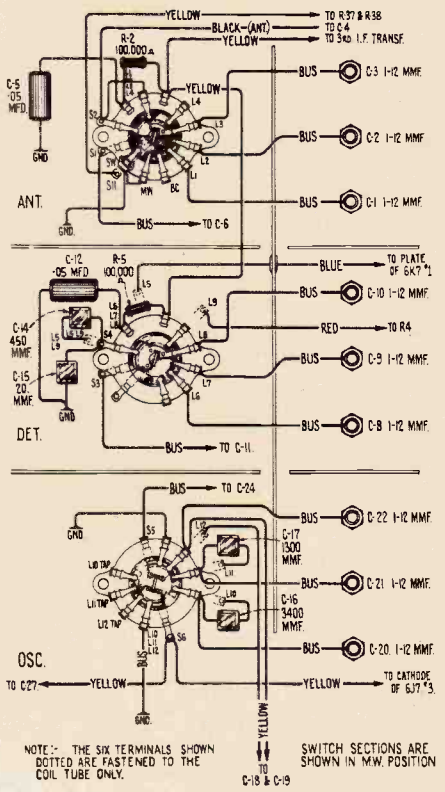
The intermediate frequency amplifier consists of 2 W-6K7 tubes in a two stage transformer coupled circuit. The windings of all three I.F. transformers are resonated by fixed capacitors and are adjusted by moulded magnetite cores (both primary and secondary) to tune to 460 Kc. A third winding, L15, in the first I.F. transformer is placed in series with the main secondary L14 when the fidelity control switch S-7 is thrown to the "broad" position (see schematic diagram), thereby increasing the coupling between the primary and secondary circuits with consequent broadening of the band width of the I.F. amplifier. The increased band width of the I.F. amplifier therefore causes less attenuation of the higher audio modulation side band frequencies, permitting higher fidelity reception.

Second Detector and A.V.C.:

The modulated signal, as obtained from the output of the I.F. system, is detected by one of the diodes of a W-6H6 tube, Audio frequency secured by this process is passed on to the control grid of a W-6C5 for amplification before reaching the driver stage. The d-c voltage which results from detection of the signal, is used for automatic volume control. This voltage, which develops across resistor R21 is applied as automatic control grid bias to the R.F. first detector and I.F. tubes through a suitable resistance filter.

The other diode of the W-6H6 tube is used to supply normal bias to the first detector and i-f radiotrons until such time as the rectified signal voltage is great enough to overcome the normal bias voltage and start the automatic volume control action.

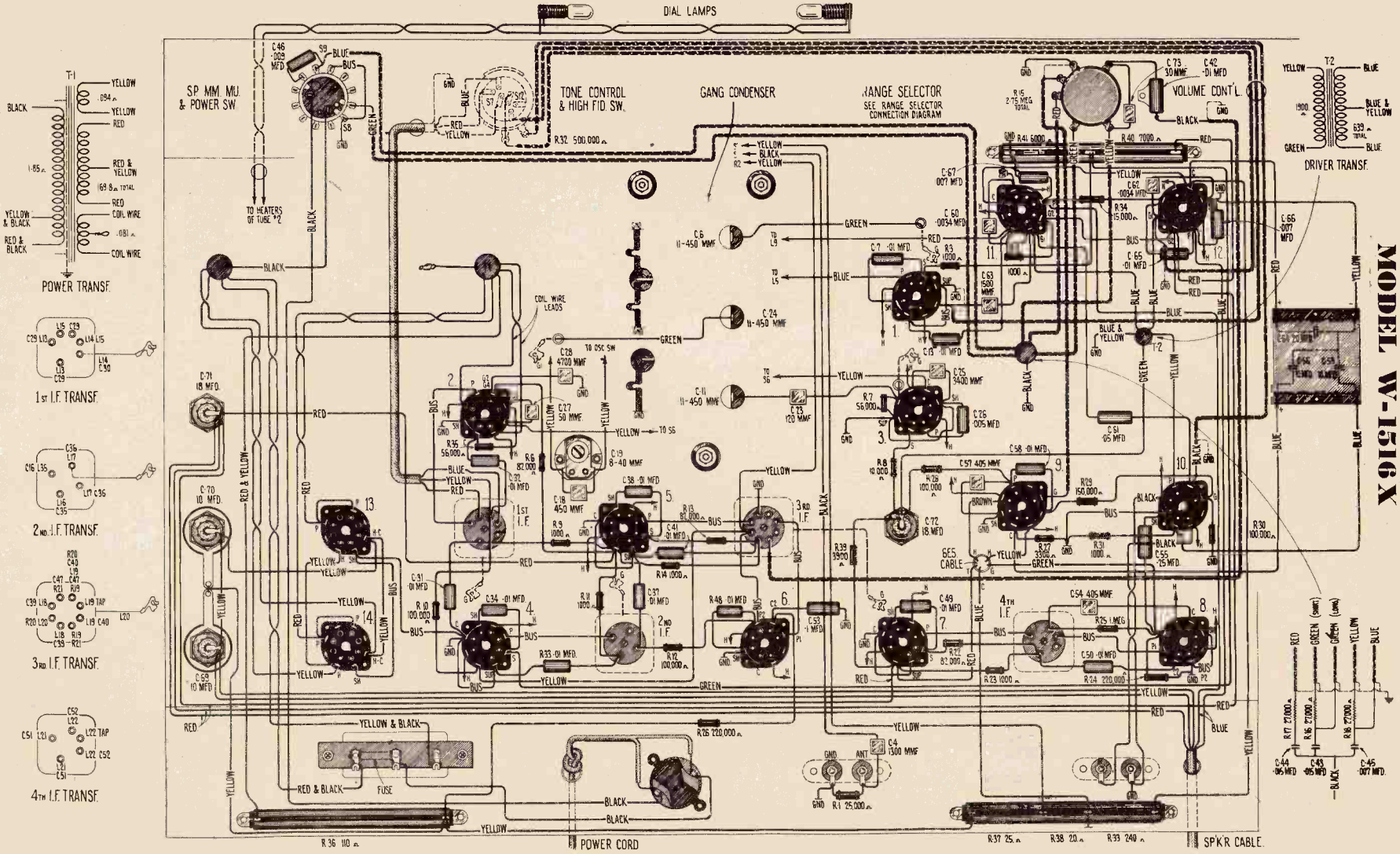
A portion of the range selector switch (S-11) is used to change the minimum bias on the radiotrons controlled by the AVC voltage, so as to reduce the minimum bias and increase the sensitivity of the receiver on the "medium wave" and "short wave" positions.



Range Selector Wiring Diagram

Tuning Indicator I.F. Adjustment:

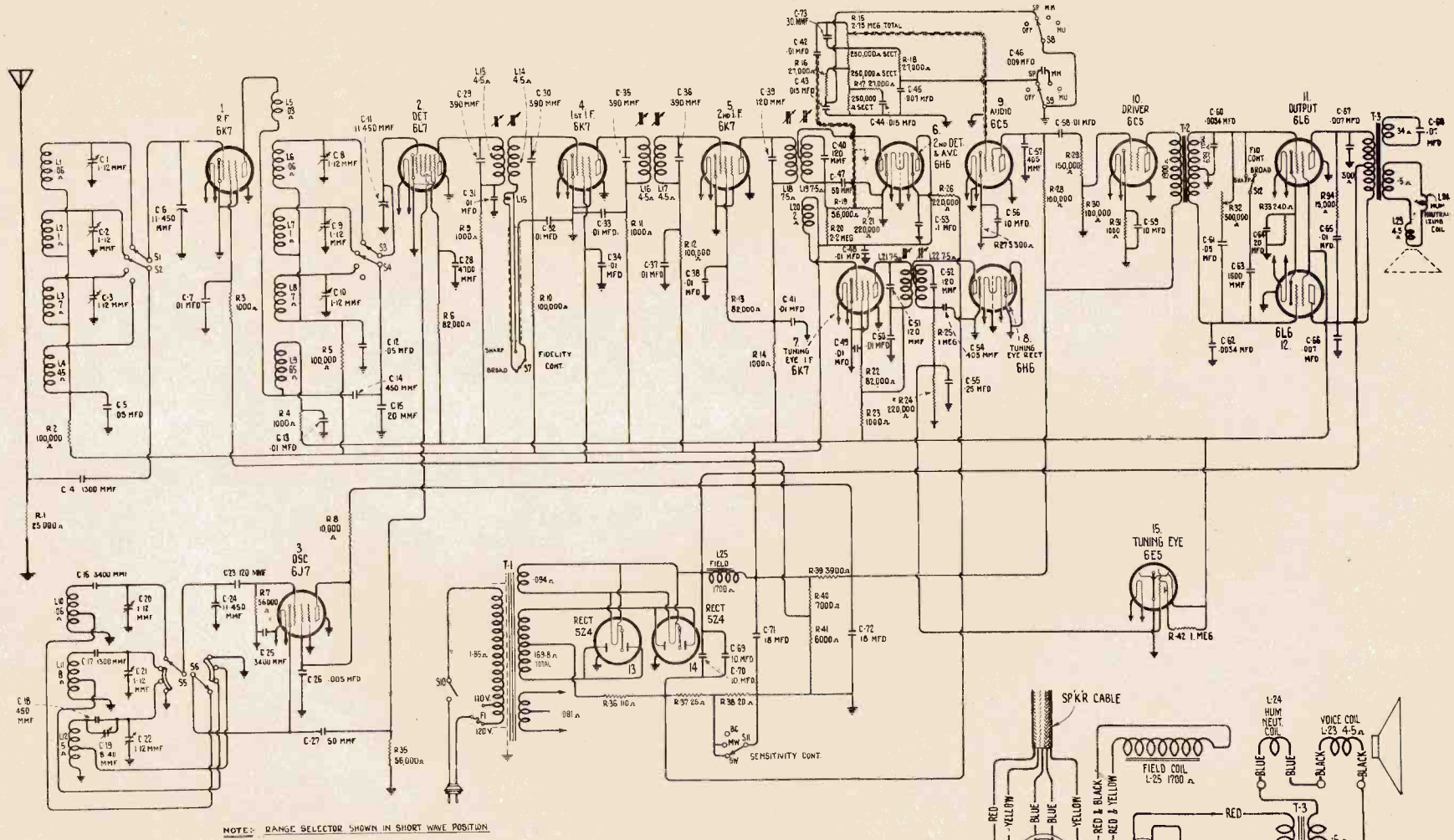
No test oscillator or output indicator is required. With the antenna connected to the receiver tune in a fairly strong signal on the broadcast band (not necessarily a local station). Without watching the resonance indicator, tune the receiver by ear very carefully to secure the best quality of reproduction. Leave the receiver tuned to this point and adjust the two magnetic core screws of the fourth (tuning indicator) I.F. transformer to secure maximum resonance indication of the W-6E5 tuning tube. The receiver may now be tuned by an unskilled operator using the W-6E5 resonance indicator to secure the same degree of fine tuning as a skilled operator secures without the use of the indicator.



Wiring Diagram

See notes under Schematic Circuit Diagram

WESTINGHOUSE MODEL W-1516 X



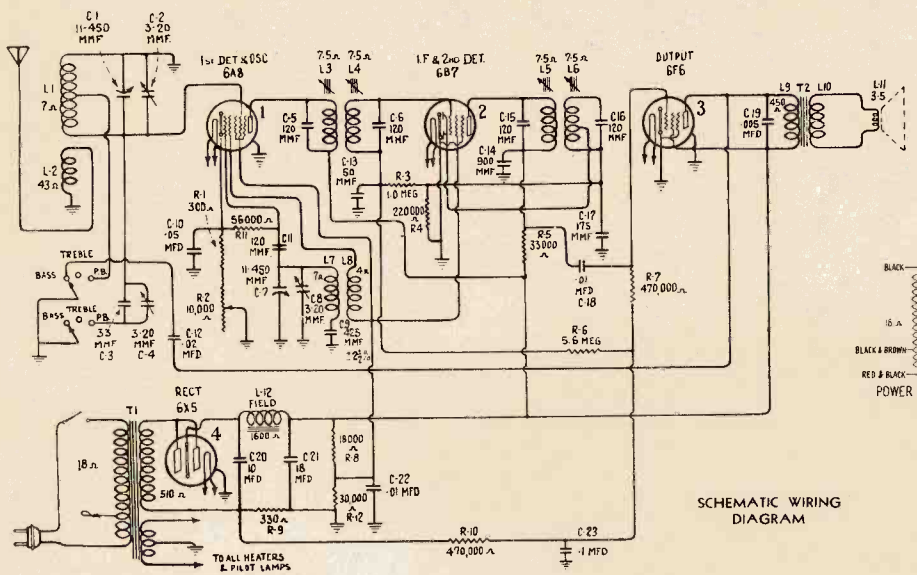
Schematic Circuit Diagram

Note 1:—On early production the heater winding was grounded at center top instead of at one side (W-6 C 5 driver socket).

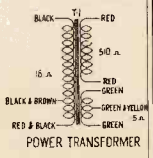
Note 2:—Resistor R 24 may be either 150,000, 175,000 or 220,000 ohms. Replace with value indicated by color code. The value of this resistor controls the action of the W-6 E 5 indicator tube.

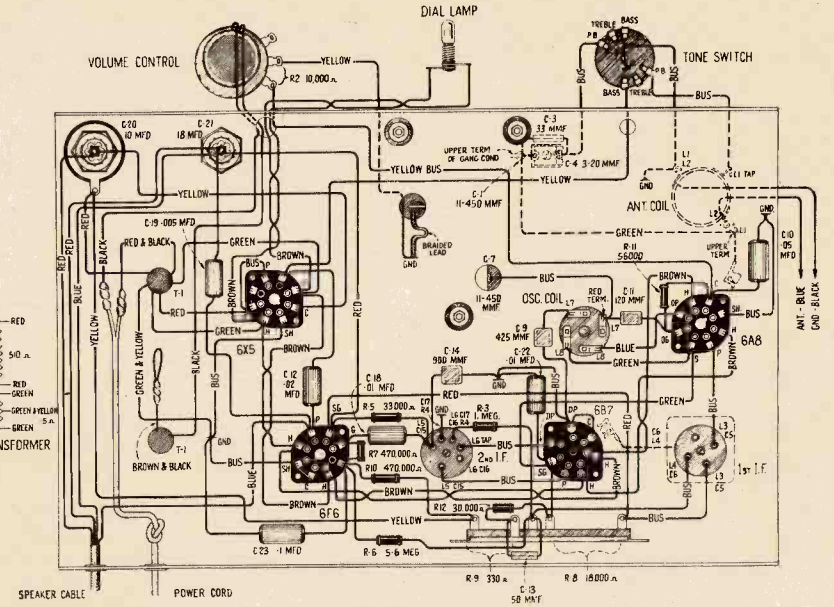
Reproducer Wiring Diagram

WESTINGHOUSE MODEL 410A



SCHEMATIC WIRING DIAGRAM





WIRING DIAGRAM

LINE FILTER CONDENSERS

Later production of the Westinghouse Model 410-A included two .02 mfd. line filter condensers. These were connected from either side of the line transformer primary to the chassis frame. The addition of these condensers permits the set to be operated with no ground connection without resulting hum.

CORRECTION TO SCHEMATIC CIRCUIT

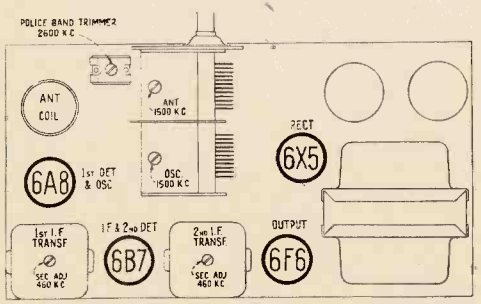
The upper diode plate of the W-6B7 should be shown connected to ground. The Wiring Diagram is correct.

Parts for Westinghouse Speaker

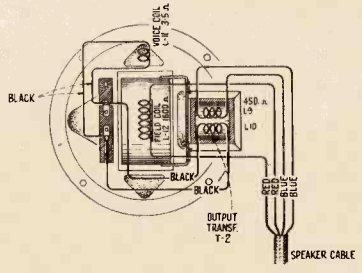
H-36130	Reproducer Assembly, less Output
H-30579	Reproducer Cone Assembly
H-32983	Output Transformer

Parts for Magnavox Speaker used on second run.

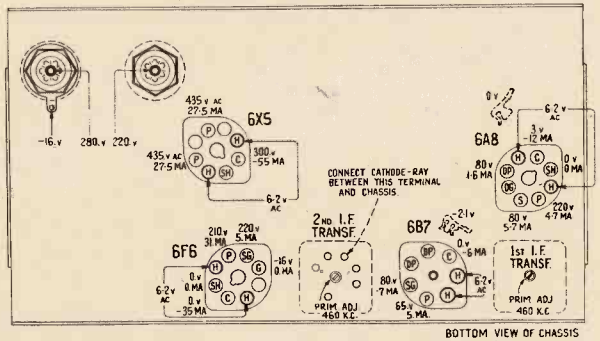
H-34488	Reproducer Complete
H-34554	Reproducer, less Output Transformer
H-34514	Reproducer Core Assembly
H-34553	Output Transformer
H-36221	Field Coil



TRIMMER LOCATIONS (also see below)

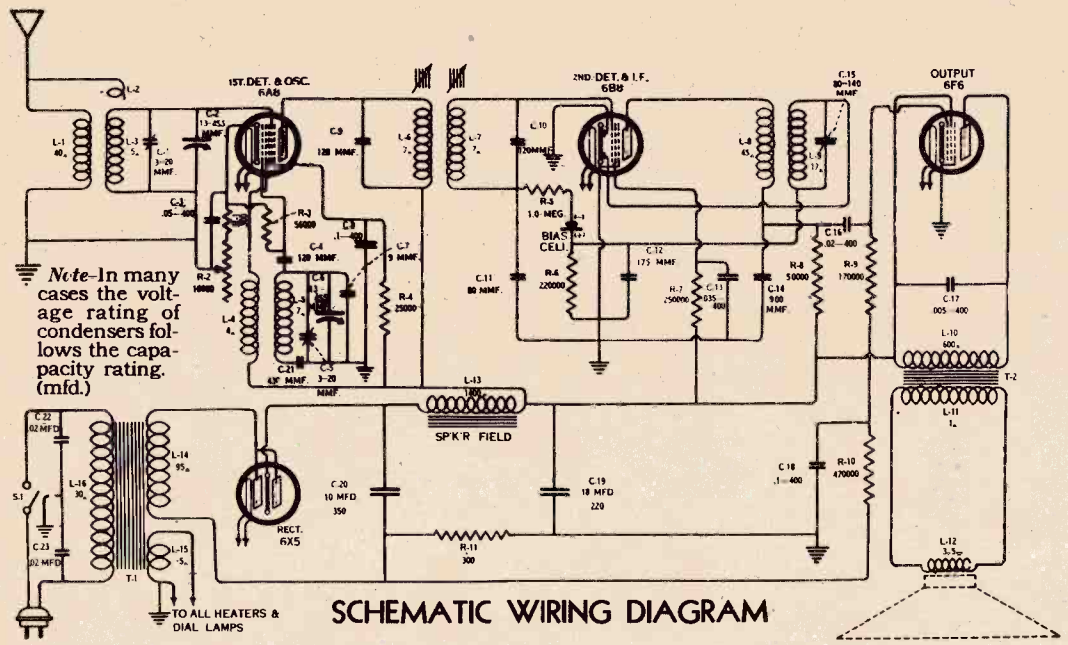


REPRODUCER CONNECTIONS



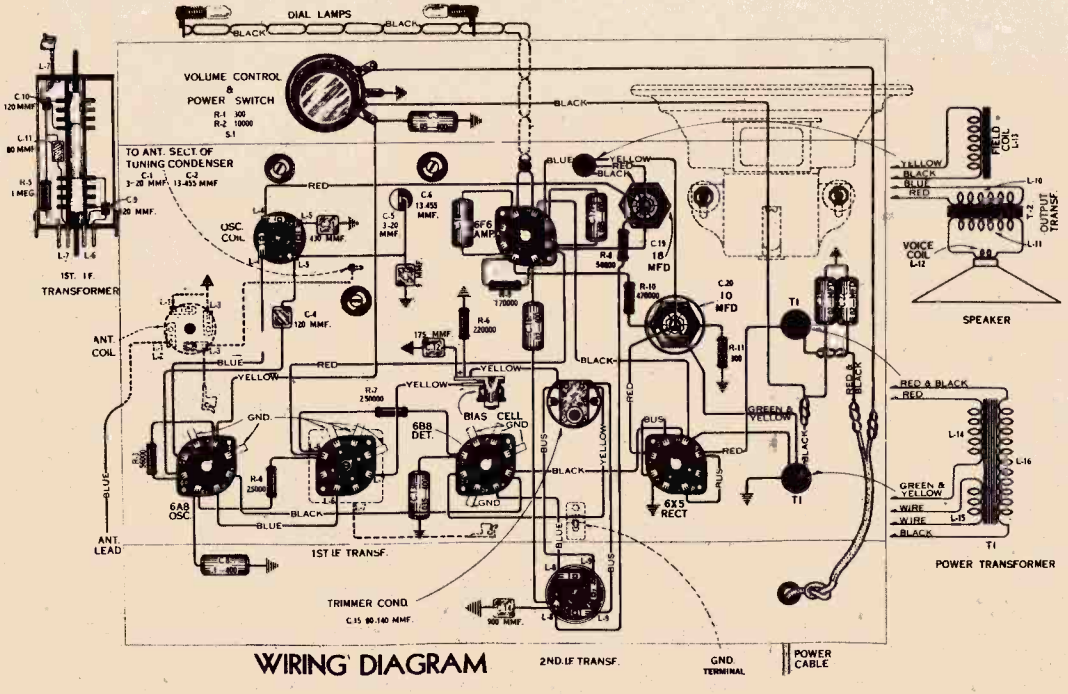
BOTTOM VIEW OF CHASSIS

SOCKET VOLTAGES

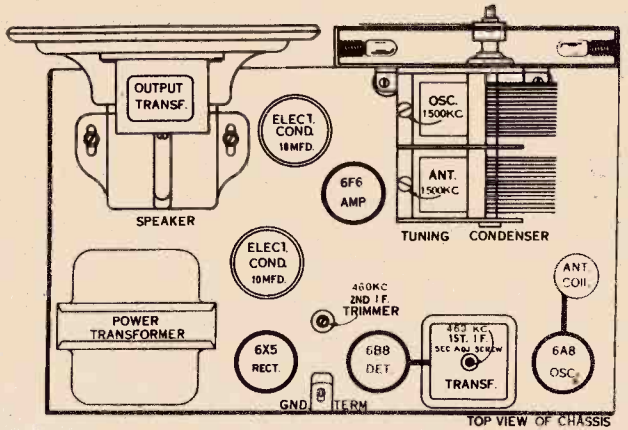


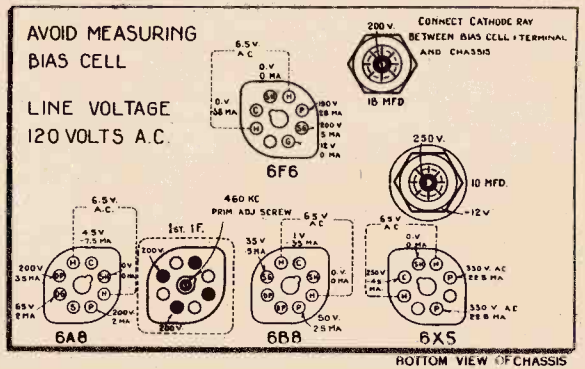
Note–In many cases the voltage rating of condensers follows the capacity rating. (mfd.)

SCHEMATIC WIRING DIAGRAM



WIRING DIAGRAM





CAUTION—Do not attempt to measure voltage on the control grid of the W-6B8 with any conventional voltmeter as paralysis of the "C-bias" cell will result.

Check "C" cell by noting whether plate current is abnormally high on W-6B8.

A further check on the C bias cell, particularly if it is suspected that the control grid lead has been grounded, is to connect a 1½ volt battery between the control grid cap of one of the tubes on the C cell circuit and the chassis frame. The negative of the battery should be connected to control grid, positive to chassis frame. This connection should be momentarily made only, and if the C cell had been weakened before, it will now be found to be recharged and ordinarily will not need to be replaced.

WESTINGHOUSE MODELS 512A, X and Y

ELECTRICAL SPECIFICATIONS

	Frequency Ranges	*Alignment Frequencies*
Broadcast (BC)	530–1720 kc.	600 kc. (osc.,) 1500 kc. (osc., ant.
Medium Wave (MW)	1720–5500 kc.	5000 kc. (osc. ant.)
Short Wave (SW)	5500–18000 kc.	17000 kc. (osc. ant.)
Intermediate Frequency		460 kc)

Radiotron Complement:

(1) W-6A8	First Det.—Oscillator	(4) W-6F6	Power Output
(2) W-6L7	Intermediate Amplifier	(5) W-5W4	Full-wave Rectifier
(3) W-6Q7	Second Det.—A.V.C. and 1st A.F. Stage		

Pilot Lamps (2) — Mazda No. 46, 6.3 volts, 0.25 amperes

Power Supply Rating — 105-125 volts, 25-60 cycles, 80 watts

Power Output Rating:		*Loudspeaker:*	
Undistorted	2.0 watts	Type	Electrodynamic
Maximum	3.0 watts	Voice Coil Impedance	1.8 ohms at 400 cycles

MECHANICAL SPECIFICATIONS

Cabinet Dimensions	*Model 512A*	*Model 512X*	*Model 512Y*
Height	11¼ inches	39 inches	40 inches
Width	23 inches	22 inches	23 inches
Depth	9¼ inches	12 inches	12 inches
Weights (Shipping)	39 pounds	70 pounds	75 pounds
Operating Controls	(1) Speech, Music and Power Switch (2) Tone; (3) Tuning; (4) Range Selector; (5) Volume		
Tuning Drive Ratios	18 to 1 and 90 to 1		

GENERAL FEATURES

These receivers employ the same chassis and have many distinctive features. The Mantel Model employs an 8-inch dynamic loudspeaker and the Console Models employ a 12 inch dynamic loudspeaker. The superheterodyne circuit is used with such features of design as magnetite core adjusted i-f transformers, air dielectric trimmers, aural compensated volume control, continuously variable tone control with music-voice switch automatic volume control, resistance coupled audio system, all metal radiotrons, and a dust-proof loudspeaker.

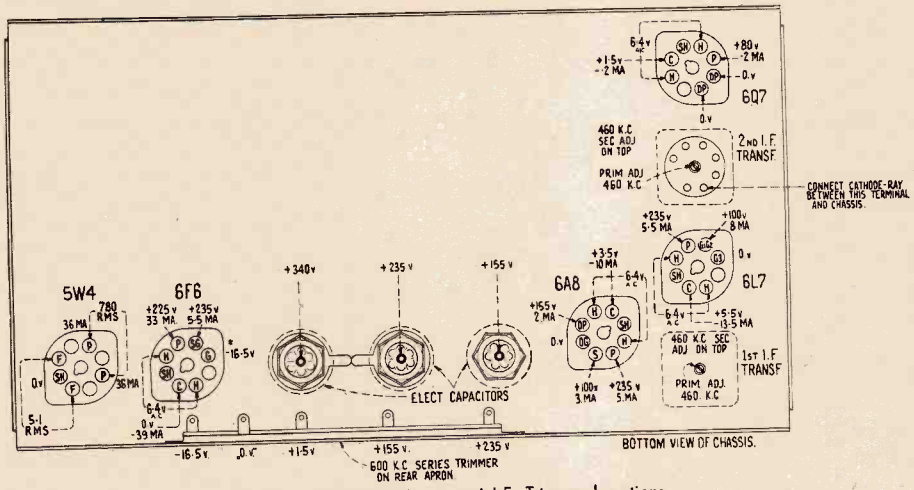
Trimming adjustments are located at accessible points. Their number is reduced to the least that is consistent with efficient operation. Tuning is continuous throughout the three ranges.

CIRCUIT ARRANGEMENT

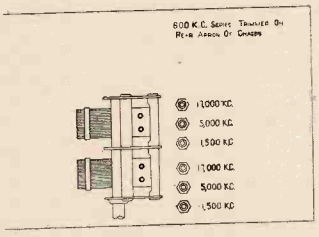
The first detector and oscillator functions are accomplished in a single tube, a W-6A8. The input of this tube is coupled to the antenna through a tuned transformer.

The R.F. coil system is greatly simplified in comparison to previous years. The antenna coil consists of only four windings to cover three ranges. By referring to the schematic circuit diagram it will be noted that by an extremely simple switching circuit coil L-1 is used only as the short wave secondary coil; coil L2 is used (depending on the switch position) as either the short wave primary winding or the medium wave secondary winding; coil L-3 is used either as the broadcast secondary winding or the medium wave primary winding; coil L-4 is the broadcast primary winding only.

The oscillator coil system uses three separate windings in the grid circuit and three separate windings in the plate circuit. The unused lower frequency windings are shorted out by means of the shorting bars on the range selector switch.

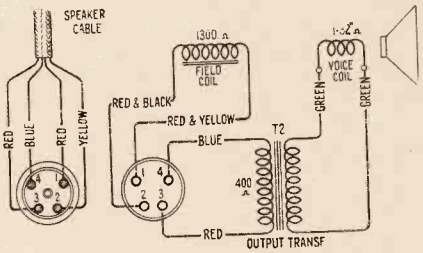


Radiotron Socket Voltages and I.F. Trimmer Locations

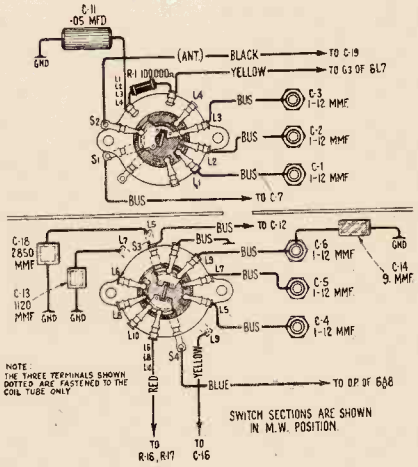


R.F. Alignment Points

When adjusting the Air Dielectric R.F. trimmers, it is necessary to use a special tool (See H-29644 in parts list) to slacken the lock nut on the trimmer, previous to the adjustment, and to tighten it again after the adjustment. Another special tool (See H-29643 in parts list) is available for making the actual adjustment to the trimmer. The adjustment should be made upward or downward on the plunger with a twisting motion. The special tool designed by the Canadian Westinghouse Company for this purpose is double ended; one end having a pin for the R.F. adjustments, the other end is a special socket screw driver for use in making I.F. adjustments.



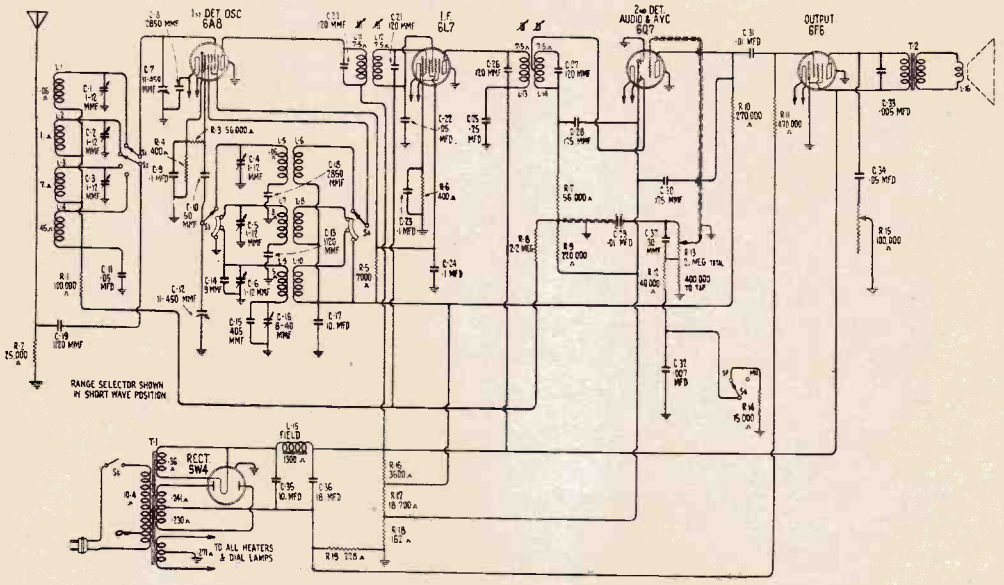
Reproducer Wiring Diagram



Range Selector Diagram

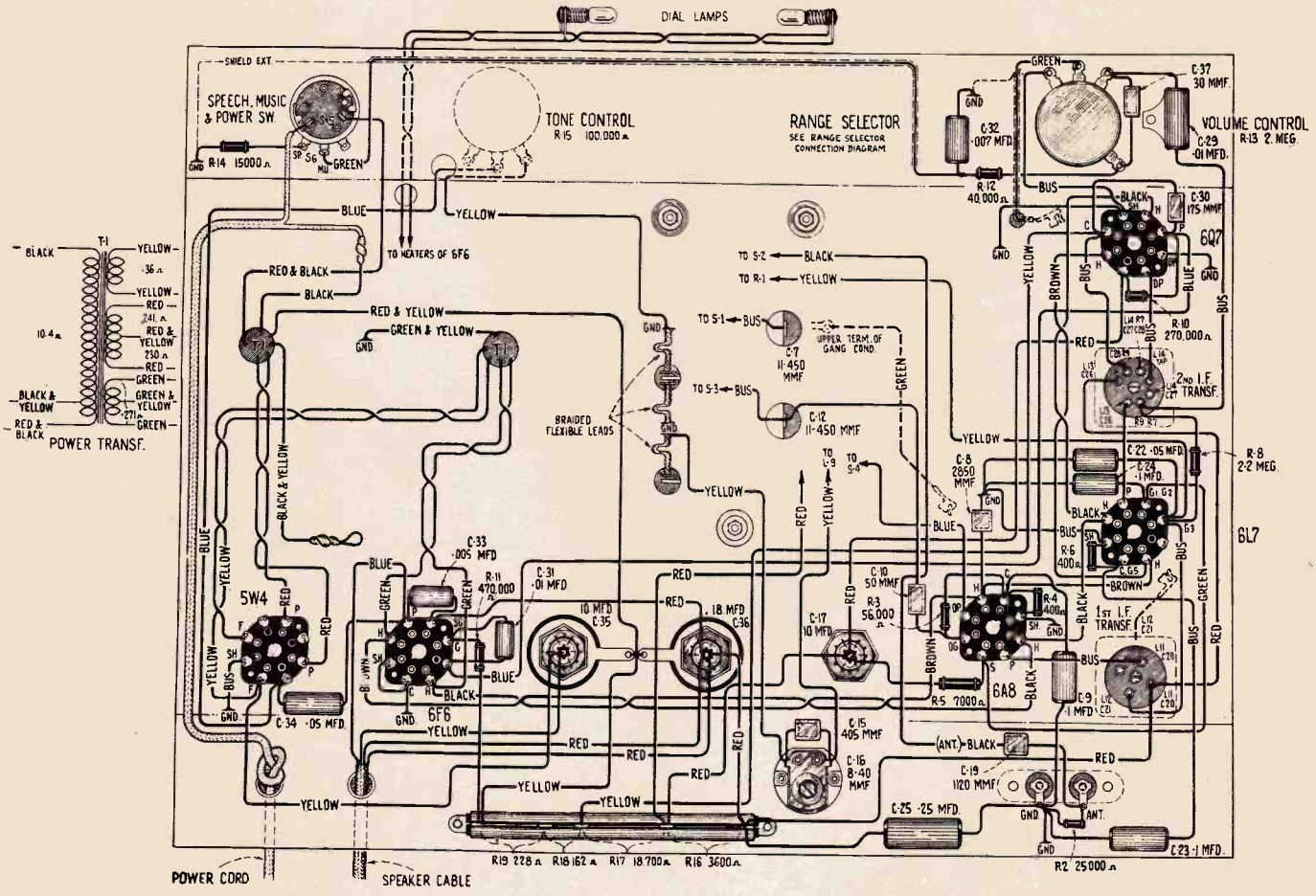
WHEN ALIGNING THE R.F. CIRCUITS, THE CHASSIS BOTTOM SHIELD MUST BE IN PLACE ON THE CHASSIS AND SECURELY FASTENED WITH ALL OF THE RETAINING SCREWS. IF THE CHASSIS BOTTOM PLATE IS REMOVED, COIL SHIELDING WILL BE INCOMPLETE AND THE R.F. CIRCUIT WILL OSCILLATE. WHEN ADJUSTING I.F. CORES WITH THE CHASSIS BOTTOM PLATE REMOVED OR DOING TROUBLE SHOOTING ON THE CHASSIS, OSCILLATION MAY BE PREVENTED BY USING A SHORT LENGTH OF WIRE WITH TWO CLIPS TO CONNECT TOGETHER THE PARTITION SHIELDS BETWEEN THE ANTENNA AND DETECTOR COILS, AND BETWEEN THE DETECTOR AND OSCILLATOR COILS.

WESTINGHOUSE MODELS 512A, X and Y



Schematic Circuit Diagram

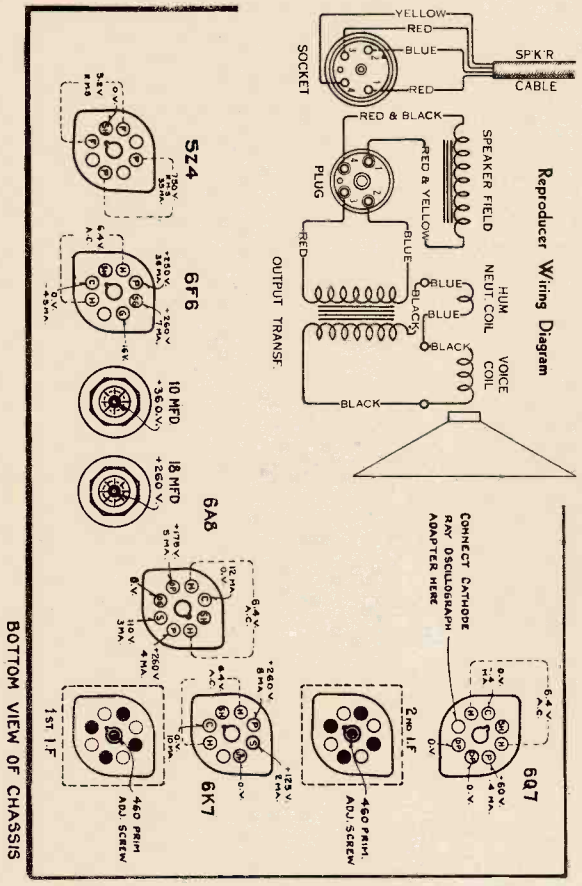
Note--R2 was 1.0 Meg. on early production. On later production, also, two line filter condensers H36176 0.02 Mfd. were added; one from each side of line transformer primary to ground.

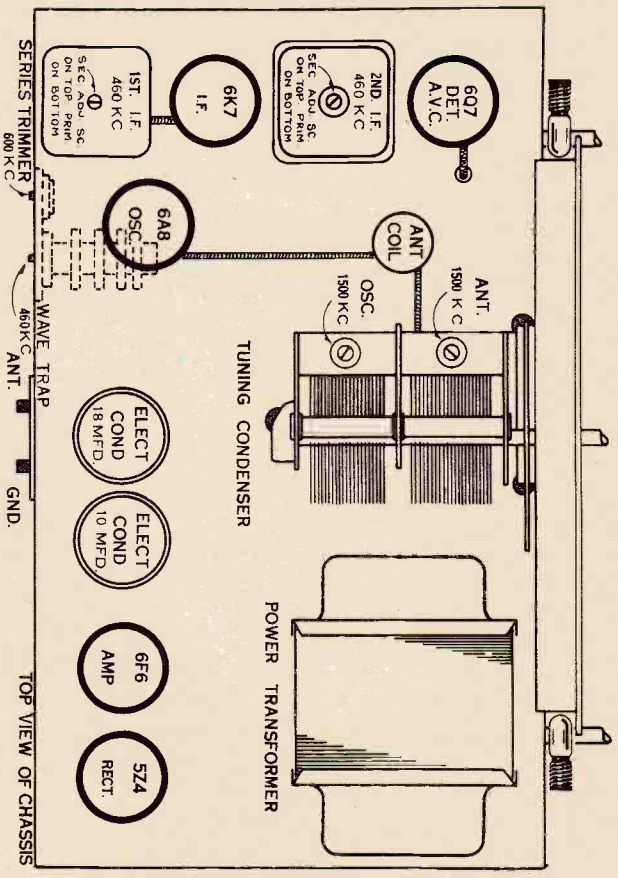


Chassis Wiring Diagram

Note--R2 was 1.0 Meg. on early production.

WESTINGHOUSE MODELS 521A and 521X





Alignment Procedure

There are three alignment trimmers provided in the antenna transformer and oscillator coil tuned circuits. One adjustment is also provided for the wave trap. The i-f transformer adjustments are made by means of screws attached to molded magnetite cores. All of these circuits have been accurately adjusted during manufacture and should remain properly aligned unless affected by abnormal conditions or altered during servicing. Loss of sensitivity, improper tone quality, and poor selectivity are the usual indications of improper alignment.

The correct performance of this receiver can only be obtained when the aligning has been done with adequate and reliable apparatus. It is not necessary to use a frequency modulated oscillator and cathode ray oscillograph to align this receiver. Those service men that have this equipment will probably prefer to use it and for their convenience we have indicated on the socket voltage diagram the proper connection point for the cathode ray vertical amplifier input terminal.

By using the Cathode Ray Adapter shown in the Replacement Parts List the cathode ray connections may be made without removing or opening the chassis.

A test oscillator is required as a source of the specified alignment frequencies. Visual indication of receiver output during the adjustment is necessary and should be accomplished by the use of an indicator or meter.

The procedure outlined below should be followed in adjusting the various trimmer capacitors and molded cores:

I-F Core Adjustments:

The four adjustment screws (attached to molded magnetite cores) of the two i-f transformers are located one on top and one on bottom of each i-f transformer. Each circuit must be aligned to a basic frequency of 460 kc. To do this, attach the output indicator across the loudspeaker voice coil.

Connect the output of the test oscillator to the control grid of the W-6A8 through a .05 mfd. capacitor. Connect the test oscillator ground terminal to the ground terminal of the receiver chassis. Tune the oscillator to 460 kc. Advance the receiver volume control to its full-on position and adjust the receiver tuning control to a point, within its range, where no interference is encountered either from local broadcast stations or from the heterodyne oscillator. Increase the output of the test oscillator until a slight indication is present on the output indicator. Adjust the two magnetite core screws of the second i-f transformer to produce maximum (peak) indicated receiver output. Then, adjust the two magnetite core screws of the first i-f transformer for maximum (peak) receiver output as shown by the indicating device. During these adjustments, regulate the test oscillator output so that the indication is always as low as possible. By doing so, broadness of tuning due to a.v.c. action will be avoided. It is advisable to repeat the adjustment of all i-f magnetite core screws to assure that the interaction between them has not disturbed the original adjustment.

R.F. Trimmer and Wave Trap Adjustments:

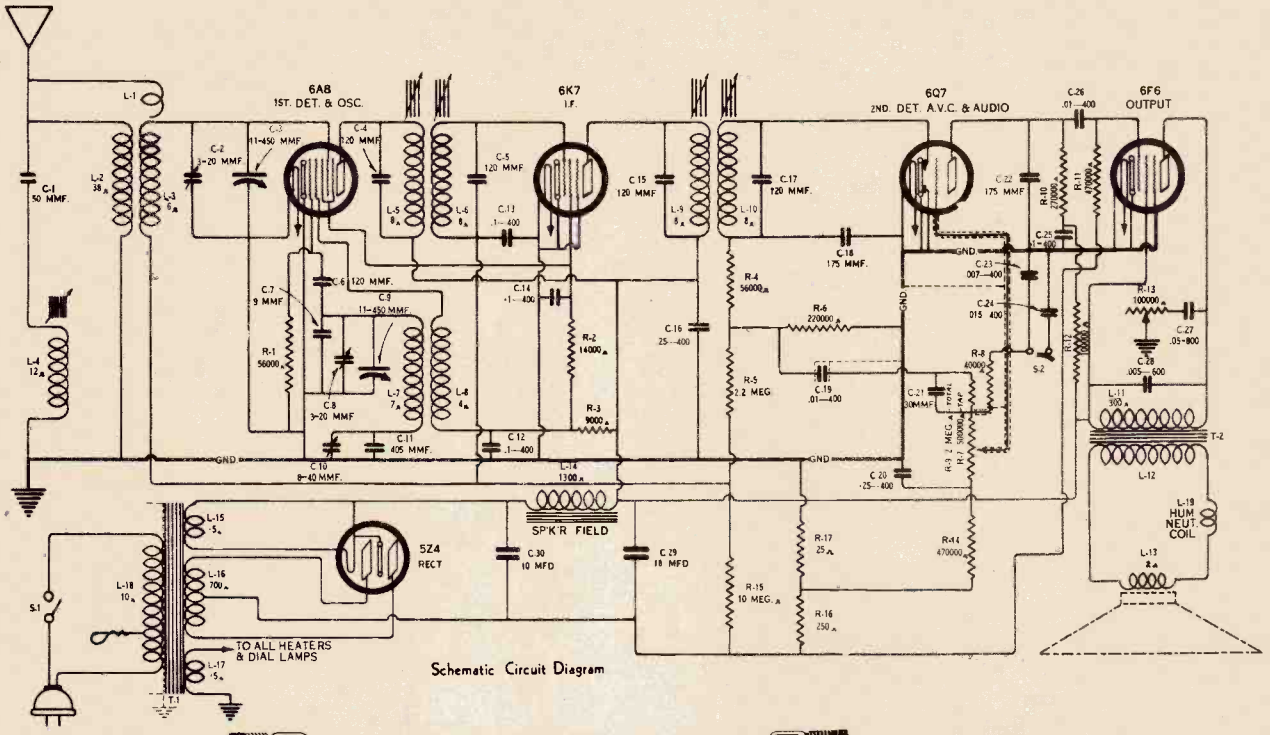
Calibrate the tuning dial by setting the pointer to the end of the border line of the dial immediately below the 530 kc. calibration point, with the gang tuning condenser in full mesh. The output indicator should be left connected to the system. Connect the test oscillator to antenna and ground terminals of the chassis through a 200 mmfd. condenser.

For best results, the wave trap should be properly tuned before making the final adjustment to the other R.F. trimmers. The wave trap is tuned by an adjustable iron core and is normally tuned to 460 kc. Should it be necessary at any time to retune it to 460 kc., set the test oscillator to deliver a frequency of 460 kc. and very carefully adjust the wave trap (using trimmer tool H-29643) until minimum output is obtained on the output indicator. Should local conditions be such that interference is generated at some other frequency within the range of 415 to 485 kc., it is possible to tune the wave trap to the interfering frequency to secure minimum interference.

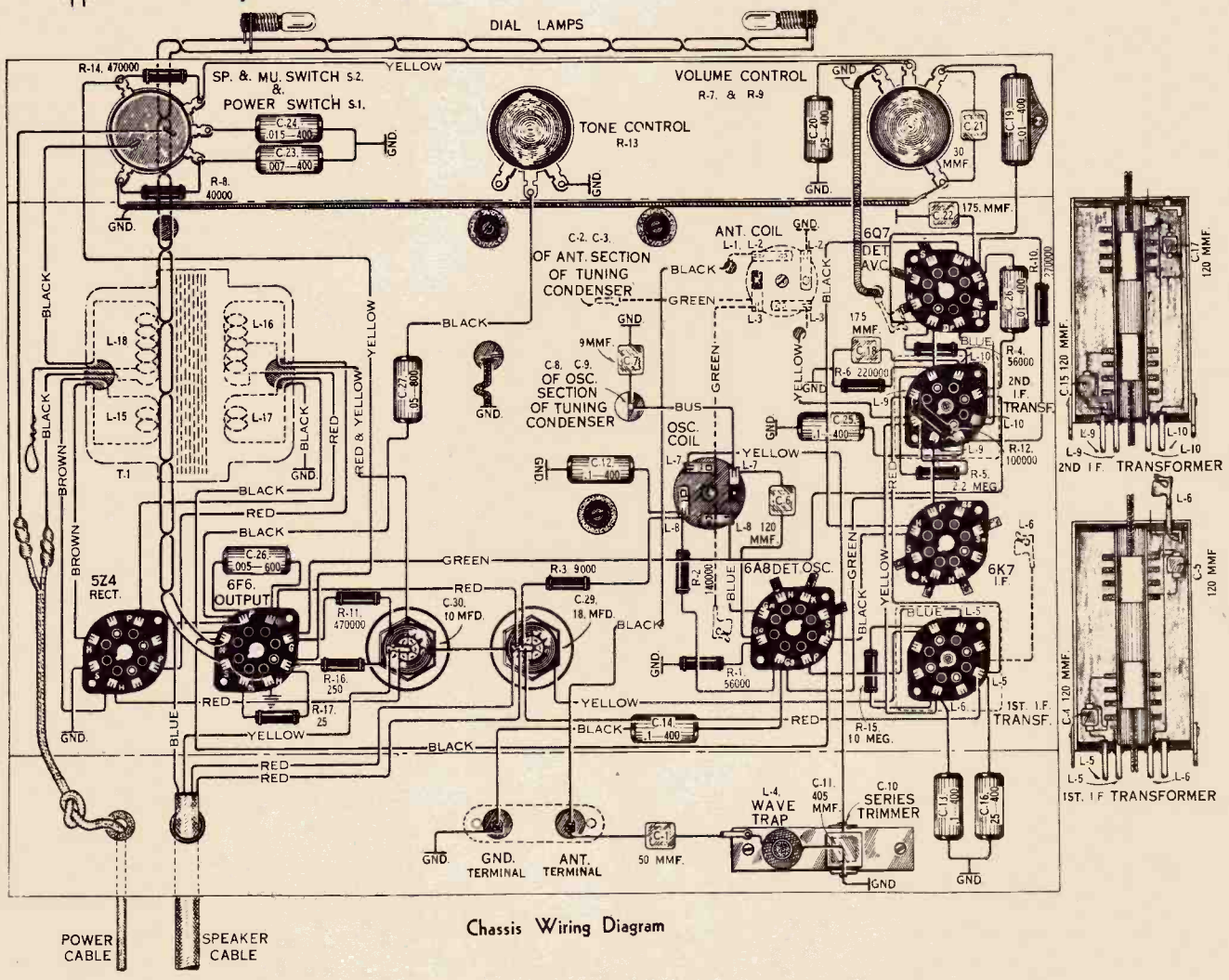
The antenna and oscillator trimmer adjustments may now be made.

Tune the test oscillator to 1500 kc. and set the receiver tuning control to a dial reading of 1500 kc. Leave the volume control of the receiver at its maximum position. Regulate the output of the test oscillator until a slight indication is perceptible at the receiver output. Then adjust the two trimmers, C8 and C2, of the oscillator and antenna transformer coils (mounted on the variable condenser) so that each produces maximum (peak) receiver output. After this maximum has been accurately obtained, shift the test oscillator to 600 kc. Tune the receiver to pick up this signal, disregarding the dial reading at which it is best received. Then, adjust the receiver oscillator series trimmer, C10, simultaneously rocking the tuning control backward and forward through the signal until maximum receiver output results from these combined operations. The adjustment at 1,500 kc. should then be repeated to correct for any change which may have been caused by the oscillator series trimmer adjustment.

WESTINGHOUSE MODELS 521A and 521X

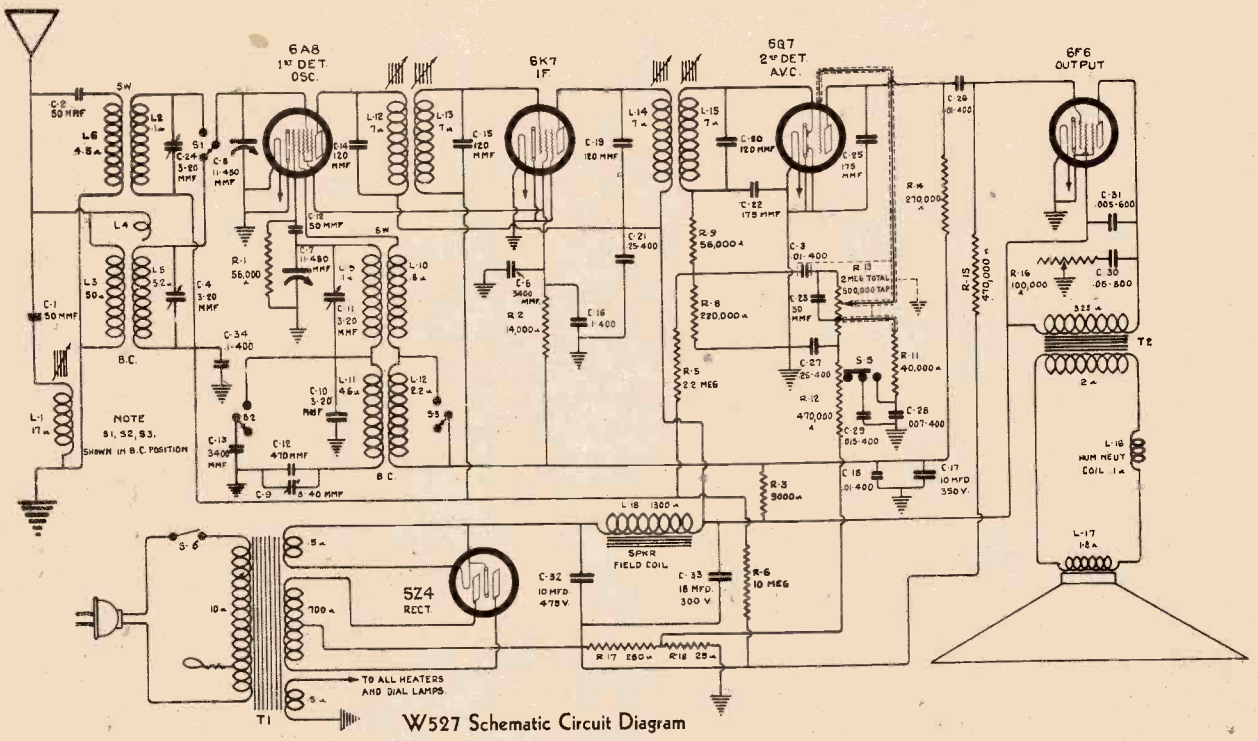


Schematic Circuit Diagram

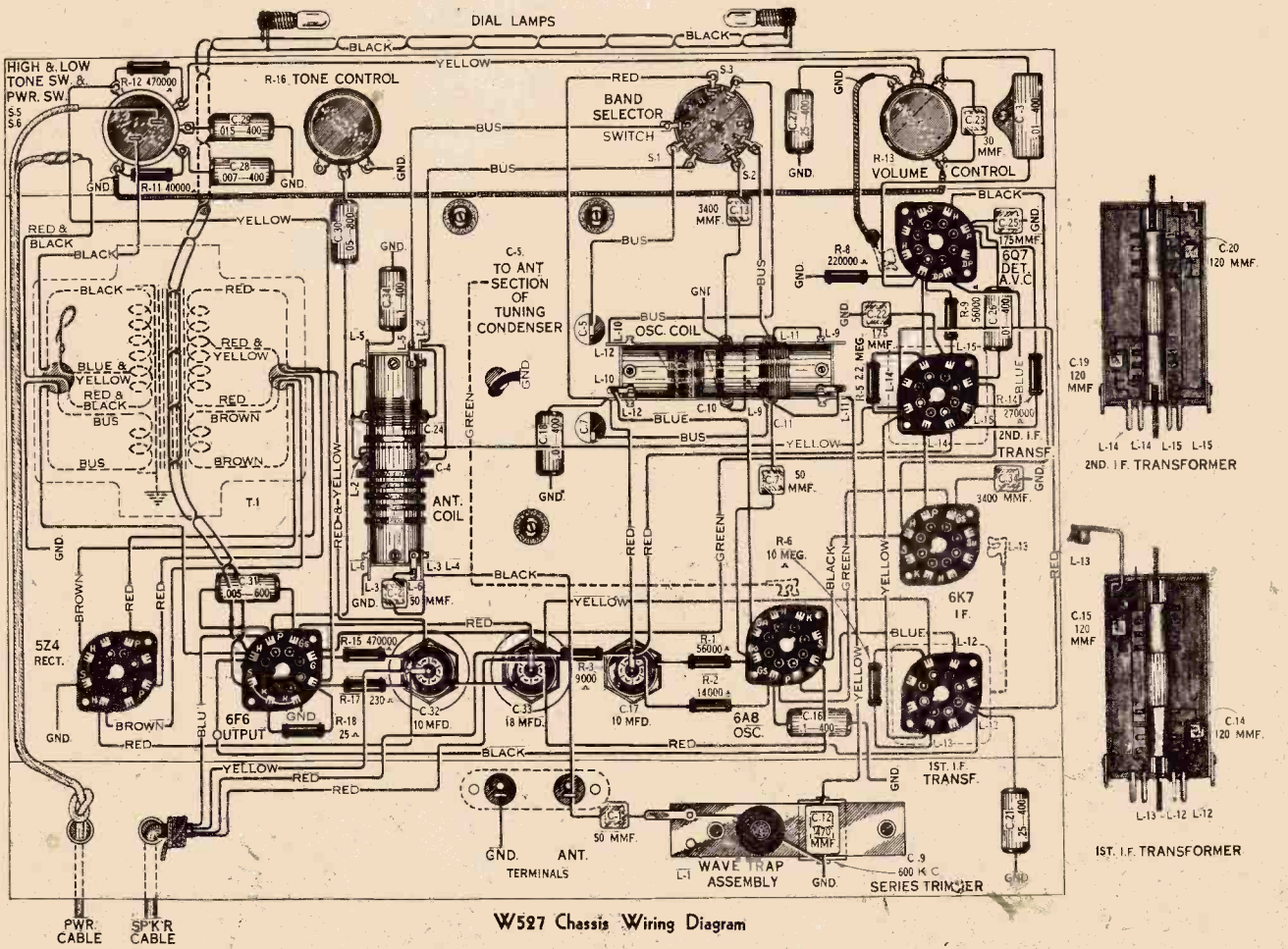


Chassis Wiring Diagram

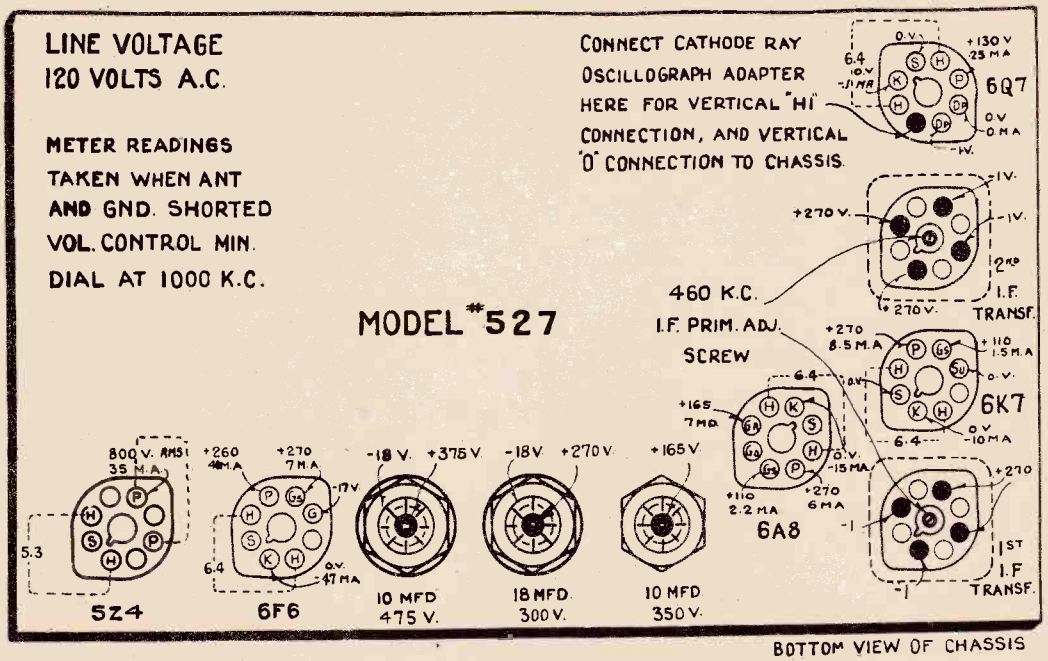
WESTINGHOUSE MODELS 527A and X



W527 Schematic Circuit Diagram



W527 Chassis Wiring Diagram



W527 ALIGNMENT CHART

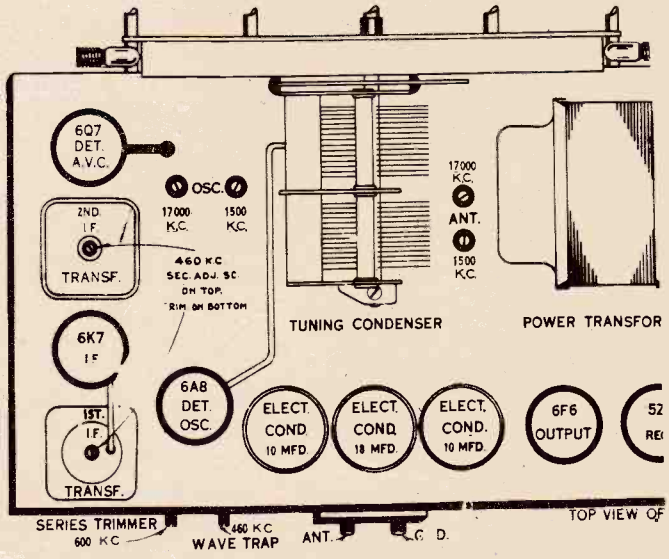
Order of Alignment	Connection To Receiver	Test Oscillator Dummy Antenna	Frequency Setting	Receiver Dial Setting	Circuit To Adjust	Adjustment Symbols	Adjust to Obtain
1	6K7 I.F. Grid Cap	.001 Mfd.	460 kc.	No Signal 550-750 kc.	2nd I.F. Transf.	L14, L15	Max. (Peak)
2	6A8 Det. Osc.	.001 Mfd.	460 kc.	No Signal 550-750 kc.	1st. I.F. Transf.	L12, L13	Max. (Peak)
3	Ant. Term.	200 Mmfd.	460 kc.	No Signal 550-750 kc.	Wave Trap	L1	Minimum Output
4	Ant. Term.	300 ohms.	17,000 kc.	17,000 kc.	S.W. Osc.	C11	Max. (Peak)*
5	Ant. Term.	300 ohms.	17,000 kc.	17,000 kc.	S.W. Ant.	C24	Max. (Peak)
6	Ant. Term.	200 Mmfd.	1,500 kc.	1,500 kc.	B.C. H.F. Osc.	C10	Max. (Peak)
7	Ant. Term.	200 Mmfd.	1,500 kc.	1,500 kc.	B.C. H.F. Ant.	C4	Max. (Peak)
8	Ant. Term.	200 Mmfd.	600 kc.	Rock Through 600 kc.	B.C. Osc.	C12	Max. (Peak)

*If two peaks obtainable use lower capacity setting and check for image at 16,080 kc.

R.F. Coil System, Model 527

The W-6A8 Radiotron in this receiver acts as both first detector and oscillator. Separate coil assemblies are provided for each function. The antenna, or first detector coil assembly, has two primary coils. Both of these coils are connected in parallel to the antenna at all times. The short wave primary coil has a small condenser in series with it to prevent it absorbing energy at broadcast frequencies. Pole S-1 of the range selector switch selects either of two antenna secondary windings, depending on whether short wave or broadcast range reception is required. Separate trimmers are provided for each coil for adjustment at the high frequency end of their respective ranges. As the two frequency ranges are so widely separated, there is no necessity to have the range switch short-circuit unused coils to prevent absorption of energy by resonance.

The oscillator plate and grid coils are wound in two sections. Each section of the grid coil has its own high frequency trimmer. There is also a low frequency trimmer for the broadcast range. In the short wave position pole S-3 short circuits the broadcast portion of the oscillator plate coil, and pole S-2, practically speaking, short circuits the broadcast grid coil through C-13 which then functions as the oscillator fixed series padding condenser.



W527 Trimmer Locations (also see Socket Meter Reading Diagram)

CHANGES IN LATER PRODUCTION WESTINGHOUSE MODELS 527, 622

Some of the later production of Model 527 used transformers designed for 110 volt, 60 cycle power lines only. These transformers are not mechanically interchangeable, and if it is necessary to change one of these 60 cycle chassis to operate on 25 cycle, it will be necessary to cut or drill the chassis frame to fit 25-60 cycle transformers. The style number follows:

Model 527 – 60 cycle, 110 volt Power Transformer, S. No. H-38247.
List Price $5.25

Later production on mantel Models 527-A and 622-A use a new reproducer which is marked "H-38261." Parts for this reproducer are not interchangeable with reproducers marked "H-34495,"

ALIGNMENT PROCEDURE

There are various alignment trimmers provided in the antenna transformer and oscillator coil tuned circuits. One adjustment is also provided for the wave trap. The i-f transformer adjustments are made by means of screws attached to molded magnetite cores. All of these circuits have been accurately adjusted during manufacture and should remain properly aligned unless affected by abnormal conditions or altered during servicing. Loss of sensitivity, improper tone quality, and poor selectivity are the usual indications of improper alignment.

The correct performance of this receiver can only be obtained when the aligning has been done with adequate and reliable apparatus. It is not necessary to use a frequency modulated oscillator and cathode ray oscillograph to align this receiver. Those service men that have this equipment will probably prefer to use it and for their convenience we have indicated on the socket voltage diagram the proper connection point for the cathode ray vertical amplifier input terminal.

By using the Cathode Ray Adapter shown in the Replacement Parts List the cathode ray connections may be made without removing or opening the chassis.

A test oscillator is required as a source of the specified alignment frequencies. Visual indication of receiver output during the adjustment is necessary and should be accomplished by the use of an indicator or meter.

The procedure outlined below should be followed in adjusting the various trimmer capacitors and molded cores:

Calibrate the tuning dial by adjusting pointer to the low frequency end of scale with gang condenser plates fully meshed. The pointer should be horizontal with its painted section resting at the end of the vertical index line. This is a friction adjustment. At the same time set the vernier dial scale (this is secured by two set screws) to read "0".

Perform alignment in proper order as shown by the accompanying chart, starting with No. 1, and following all operations across, then No. 2, etc. The chassis bottom shield must be securely in place when making R.F. adjustments. Adjustment locations and frequencies are shown on a sticker fastened to the bottom side of the chassis shield. These trimmer locations are also shown in one of the accompanying illustrations.

Connect the "low" output terminal of the test oscillator to the receiver chassis for all alignment operations. Regulate the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output terminal and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc." means that the receiver should be tuned to a point between 550 and 750 kc. where no signal or interference is received from a station or the receiver (heterodyne) oscillator.

The term "Rock Through" indicates that the receiver station selector should be rocked back and forth while making the indicated adjustment. The adjustment and rocking should be continued until the combined action results in the maximum deflection on the output meter.

When adjusting oscillator circuits that have both series and shunt trimmers it is good practice to repeat the adjustment on the oscillator shunt trimmer after making the adjustment on the oscillator series trimmer. On some tuning ranges it is found that more than one peak may be secured if the trimmer is adjusted over a wide enough range. When this occurs it should be noted that oscillator circuits should be aligned, using that peak which occurs at the lower capacity setting of the trimmer. On R.F. or first detector trimmers the peak occurring with the larger capacity setting of the trimmer should be used.

It is also good practice to make sure that the trimmers on the short-wave ranges are set so that the oscillator stage develops its signal at a higher frequency than the signal to which the R.F. stage (or stages) is tuned. This check can be made by advancing the test oscillator output control and tuning the receiver above and below the frequency of the test oscillator, noting at what frequency the test signal reappears. It should reappear at a frequency setting on the receiver dial lower than the test oscillator frequency by an amount equal to twice the intermediate frequency.

Due to the small number of trimmers on the Model 622, it may occasionally be necessary to set the trimmers that are available in a position so as to compromise between maximum sensitivity and absolutely correct dial setting. It may also be necessary to replace a coil assembly if due to accident serious misalignment occurs which cannot be corrected by the trimmers available.

It is possible to use a tuning wand (such as stock RCA-6679) in the usual way as a check-up on coil alignment, but in order to do this it will be necessary to drill two openings in the chassis shield to permit insertion of the tuning wand into the coils under operating conditions. This check with the tuning wand should be made in all cases before replacing any coil assemblies.

R.F. Coil System, Model 622

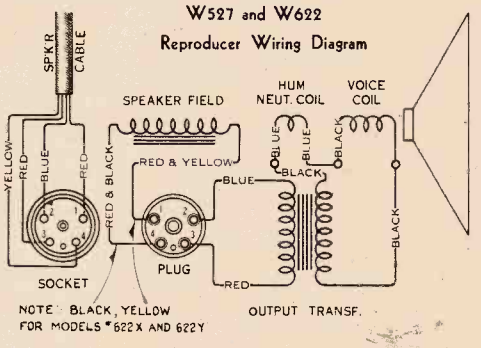
This circuit also uses a Radiotron W-6A8 as both first detector and oscillator, with separate coil assemblies for each. The antenna coil consists of only four windings to cover three ranges. By referring to the schematic circuit diagram, it will be noted that by an extremely simple switching circuit, coil L-2 is used only as the short wave secondary coil; coil L-3 is used (depending on the switch position) as either the short wave primary winding or the medium wave secondary winding; coil L-4 is used either as the broadcast secondary winding or the medium wave primary winding; coil L-5 is the broadcast primary winding only.

The oscillator coil assembly uses three separate windings in the grid circuit and three separate windings in the plate circuit. The unused lower frequency windings are shorted out by means of the shorting bars on the range selector switch.

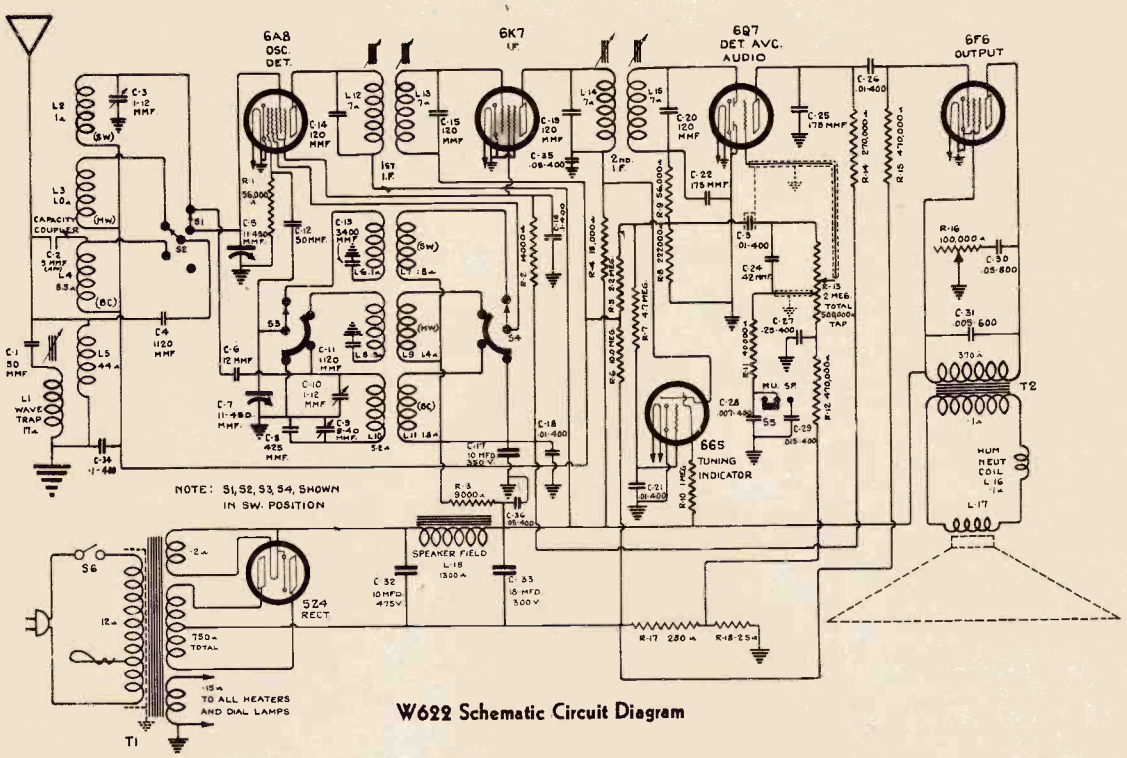
It will be noted that there are only three R.F. trimmers (exclusive of the wave trap adjustment). One is used to align the short wave antenna coil with the oscillator coil. No trimmers are used in the medium wave band. The remaining two are the oscillator, 1500 kc. and the oscillator, 600 kc., trimmers used to align the oscillator broadcast range circuit with the antenna coil and dial scale.

Reference to condenser C-6 on the schematic diagram gives an excellent illustration of how the utmost in economy, consistent with outstanding performance, is applied to the design of these receivers. This condenser is located to take advantage of the existing range switching system. It will be noted that in the short wave position of the range selector, condenser C-6 adds its capacity in parallel with condenser C-3, to aid in securing alignment. In the broadcast position of the range selector, this condenser is (neglecting the small inductance of the coil L-2 at broadcast frequency) in parallel with the oscillator tuned circuit and aids in securing alignment. Due to precision manufacturing it has been found possible to eliminate all but three of the customary R.F. trimmers, and two of the trimmers used are of the air dielectric type.

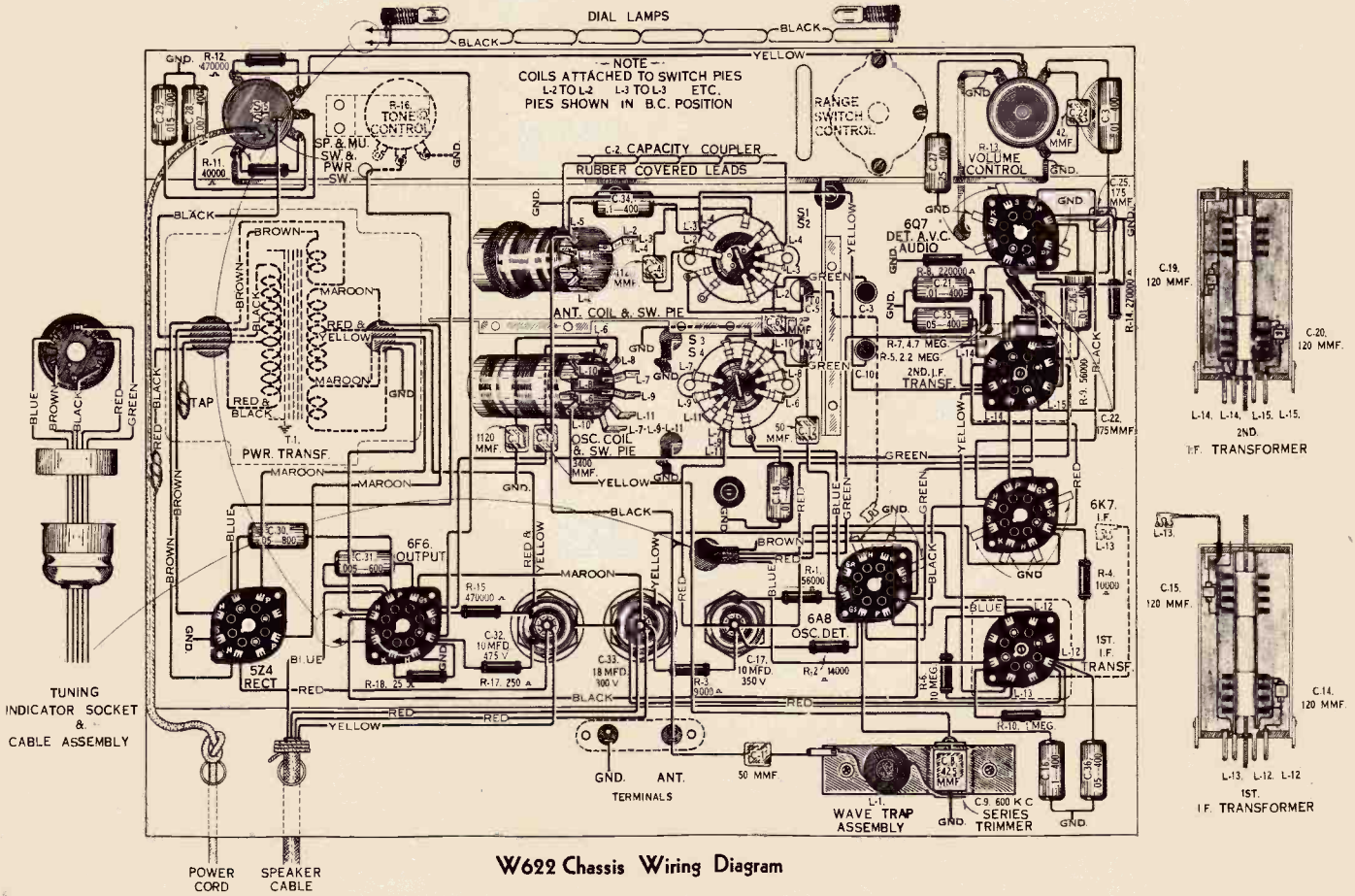
W527 and W622
Reproducer Wiring Diagram



WESTINGHOUSE MODELS 622 A, X and Y



W622 Schematic Circuit Diagram

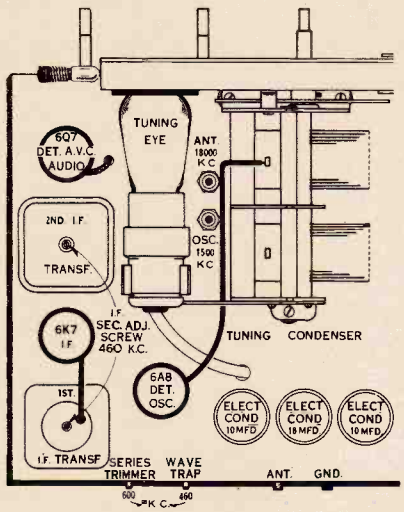


W622 Chassis Wiring Diagram

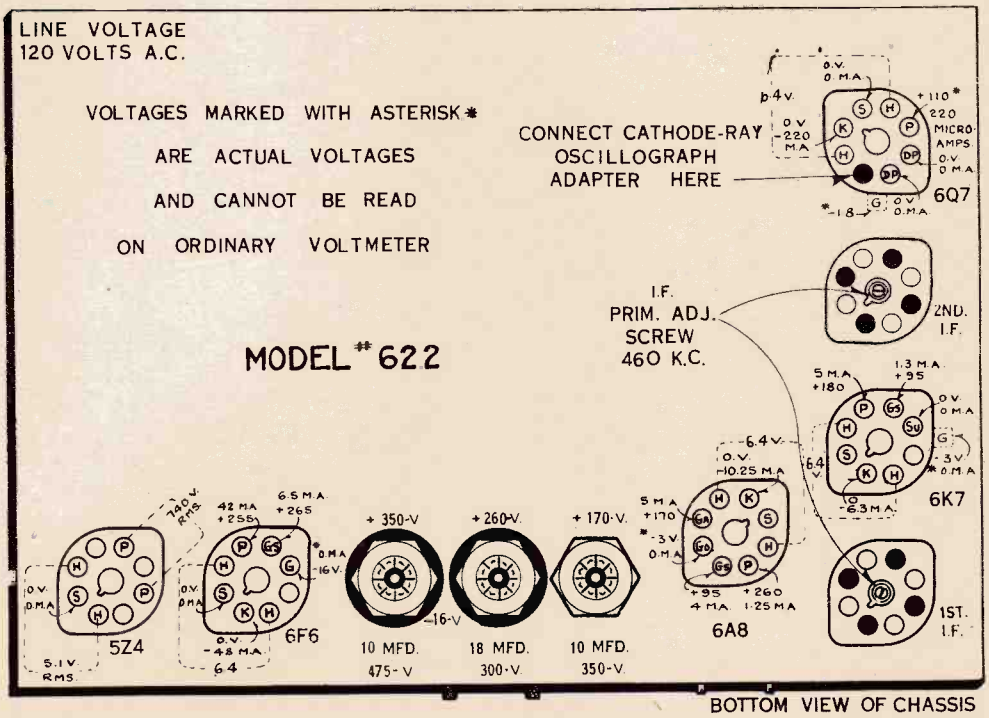
W622 ALIGNMENT CHART

Order of Alignment	Connection To Receiver	Test Oscillator Dummy Antenna	Frequency Setting	Receiver Dial Setting	Circuit To Adjust	Adjustment Symbols	Adjust to Obtain
1	6K7 I.F. Grid Cap	.001 Mfd.	460 kc.	No Signal 550-750 kc.	2nd. I.F. Transf.	L14, L15	Max. (Peak)
2	6A8 Det. Osc.	.001 Mfd.	460 kc.	No. Signal 550-750 kc.	1st. I.F. Transf.	L12, L13	Max. (Peak)
3	Ant. Term.	200 Mmfd.	460 kc.	No Signal 550-750 kc.	Wave Trap	L1	Minimum Output
4	Ant. Term.	300 ohms.	18,000 kc.	18,000 kc.	S.W. Ant.	C3	Max. (Peak)*
5	Ant. Term.	200 Mmfd.	1,500 kc.	1,500 kc.	B.C. H.F. Osc.	C10	Max. (Peak)
6	Ant. Term.	200 Mmfd.	600 kc.	Rock Through 600 kc.	B.C. L.F. Osc.	C9	Max. (Peak)

*If two peaks obtainable use higher capacity setting and check for image at 17,020 kc.



W622 Trimmer Locations



CANADIAN WESTINGHOUSE MODEL 622-Z SIX TUBE THREE RANGE A.C. RECEIVER.

This receiver chassis is an exact duplication of Models 622 A. X. and Y with the exception of a few changes in resistor and condenser ratings, and a change from the Power, Music, Speech Switch to a Continuously Variable Bass Tone Control in the plate circuit of the 6Q7 Radiotron. This Control has Power Switch attached.

A new design radio cabinet is used having the same chassis and speaker mounting dimensions as the 622X and Y. The overall dimensions and front appearance are slightly different.

Height 39¼" Width 23¼" and Depth 12".

MOTOR-BOATING ON THE 16 METER BAND

It will be noticed on some of the above chassis that R1 is 27;000 ohms and R2 is 10,000 ohms instead of 56,000 ohms and 14,000 ohms respectfully, as shown on schematic diagram

This change is only necessary when a motor boating condition is encountered on the 16 Meter Band—and is not rectified by changing 6A8 Det. Osc. Radiotron.

WESTINGHOUSE MODELS 813A, X and Y

ELECTRICAL SPECIFICATIONS

	Frequency Ranges	*Alignment Frequencies*
Broadcast (BC)	530–1720 kc.	600 kc. (osc.,) 1500 kc. (osc., ant.)
Medium Wave (MW)	1720–5500 kc.	5000 kc. (osc. ant.)
Short Wave (SW)	5500–18000 kc.	17000 kc. (osc. ant.)
Intermediate Frequency		460 kc.

Radiotron Complement:

(1) W-6L7	First Det.	(5) W-6F5	First A.F. Stage
(2) W-6J7	Oscillator	(6) W-6F6	Power Output
(3) W-6K7	Intermediate Amplifier	(7) W-5W4	Full-wave Rectifier
(4) W-6H6	Second Det.—A.V.C.	(8) W-6E5	Tuning Indicator

Pilot Lamps (2) ..... Mazda No. 46, 6.3 volts, 0.25 amperes

Power Supply Rating ..... 105-125 volts, 25-60 cycles, 80 watts

Power Output Rating:

Undistorted	2.0 watts
Maximum	3.0 watts

Loudspeaker:

Type	Electrodynamic
Voice Coil Impedance	1.8 ohms at 400 cycles

MECHANICAL SPECIFICATIONS

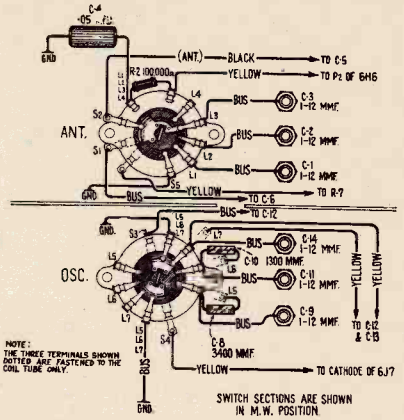
Cabinet Dimensions	*Model 813A*	*Model 813X*	*Model 813Y*
Height	12¼ inches	40 inches	40 inches
Width	24 inches	23 inches	23 inches
Depth	9½ inches	16¼ inches	12 inches
Weights (Shipping)	40 pounds	92 pounds	75 pounds
Operating Controls	(1) Speech, Music and Power Switch (2) Tone; (3) Tuning; (4) Range Selector; (5) Volume		
Tuning Drive Ratios	18 to 1 and 90 to 1		

CIRCUIT ARRANGEMENT

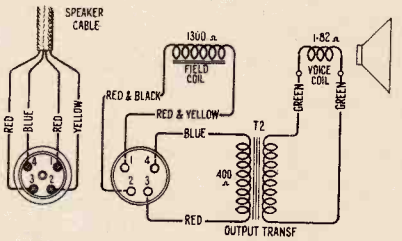
Radiotron W-6L7, which is particularly designed to give high efficiency and stability as the first detector is employed for this purpose. A separate oscillator tube, W-6J7, is also used.

The R.F. coil system is greatly simplified in comparison to previous years. The antenna coil consists of only four windings to cover three ranges. By referring to the schematic circuit diagram it will be noted that by an extremely simple switching circuit coil L-1 is used only as the short wave secondary coil; coil L2 is used (depending on the switch position) as either the short wave primary winding or the medium wave secondary winding; coil L-3 is used either as the broadcast secondary winding or the medium wave primary winding; coil L-4 is the broadcast primary winding only.

The oscillator coil system uses three only, tapped windings in the well known Hartley circuit. The unused lower frequency windings are shorted out by means of the shorting bars on the range selector switch.



Range Selector Diagram



Reproducer Wiring Diagram

Alignment Procedure

I-F Core Adjustments:

The four adjustment screws (attached to molded magnetite cores) of the two i-f transformers are located one on top and one on bottom of each i-f transformer. Each circuit must be aligned to a basic frequency of 460 kc. To do this, attach the output indicator across the loudspeaker voice coil.

Connect the output of the test oscillator to the control grid of the W-6L7 through a .05 mfd. capacitor. Connect the test oscillator ground terminal to the ground terminal of the receive chassis. Tune the oscillator to 460 kc. Advance the receiver volume control to its full-on position and adjust the receiver tuning control to a point, within its range, where no interference is encountered either from local broadcast stations or from the heterodyne oscillator. Increase the output of the test oscillator until a slight indication is present on the output indicator. Adjust the two magnetite core screws of the second i-f transformer to produce maximum (peak) indicated receiver output. Then adjust the two magnetite core screws of the first i-f transformer for maximum (peak) receiver output as shown by the indicating device. During these adjustments, regulate the test oscillator output so that the indication is always as low as possible. By doing so, broadness of tuning due to a.v.c. action will be avoided. It is advisable to repeat the adjustment of all i-f magnetite core screws to assure that the interaction between them has not disturbed the original adjustment.

Broadcast Trimmer Adjustments:

Calibrate the tuning dial by setting the pointer to the angle of the border line of the dial immediately below the 530 kc. calibration point, with the two-gang tuning condenser in full mesh. The output indicator should be left connected to the system. Connect the test oscillator to antenna and ground terminals of the chassis through a 200 mmfd. condenser. Adjust the test oscillator to 1500 kc. and set the receiver tuning control to a dial reading of 1500 kc. Leave the volume control of the receiver at its maximum position. Make sure that the Range Selector is at its broadcast position. Regulate the output of the test oscillator until a slight indication is perceptible at the receiver output. Then adjust the two 1500 kc. trimmers (see diagram) of the oscillator and antenna transformer coils so that each produces maximum (peak) receiver ouput. After this maximum has been accurately obtained, shift the test oscillator to 600 kc. Tune the receiver to pick up this signal, disregarding the dial reading at which it is best received. Then, adjust the receiver 600 kc. series trimmer, C16, simultaneously rocking the tuning control backward and forward through the signal until maximum receiver output results from these combined operations. The adjustment at 1,500 kc. should then be repeated to correct for any change which may have been caused by the oscillator series trimmer adjustment.

"Medium Wave" Trimmer Adjustments

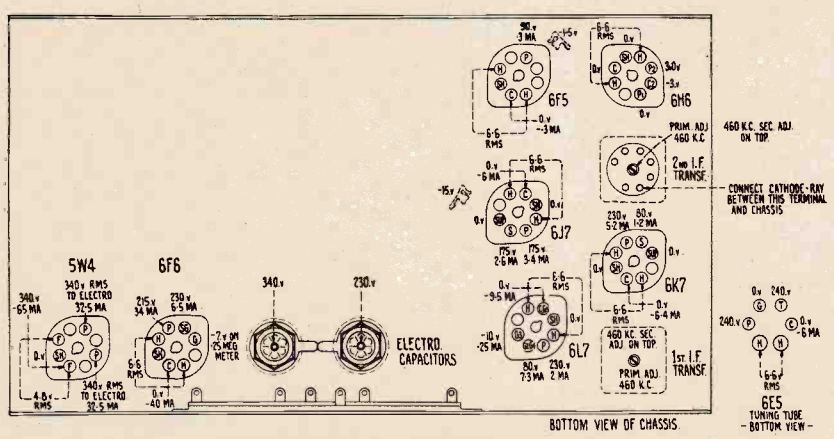
Use the same equipment and layout as for broadcast trimmer adjustment. Place receiver range selector to its "medium wave" position with the receiver dial pointer set to 5000 kc. Tune the test oscillator to 5000 kc.; adjust the two air dielectric trimmers (see diagram) for maximum output. Two peaks may be found on the oscillator trimmer. The peak obtained with minimum capacity (plunger nearly out) should be used.

"Short Wave" Trimmer Adjustments

Leave the equipment set up the same as for the broadcast trimmer adjustment except that the output of the test oscillator to the antenna terminal of the receiver should be connected through a 400 ohm resistor. Set the receiver range selector to its "short wave" position and dial pointer to 17,000 kc. Tune the test oscillator to 17,000 kc. Adjust the oscillator 17,000 kc. trimmer (see diagram) for maximum output. Two peaks may be found. The peak with minimum capacity (plunger nearly out) should be used. Adjust the antenna 17,000 kc. trimmer until maximum output is reached, while slightly rocking the gang tuning condenser back and forth through the signal. Two peaks may be found with this circuit. The peak with maximum capacity (plunger nearly in) should be used. Check the image frequency by changing the receiver dial setting to 16,080 kc. The test oscillator signal should be faintly received at this position, indicating that the adjustment of the oscillator 17,000 kc. trimmer has been correctly made. No adjustment should be made while checking for this image signal.

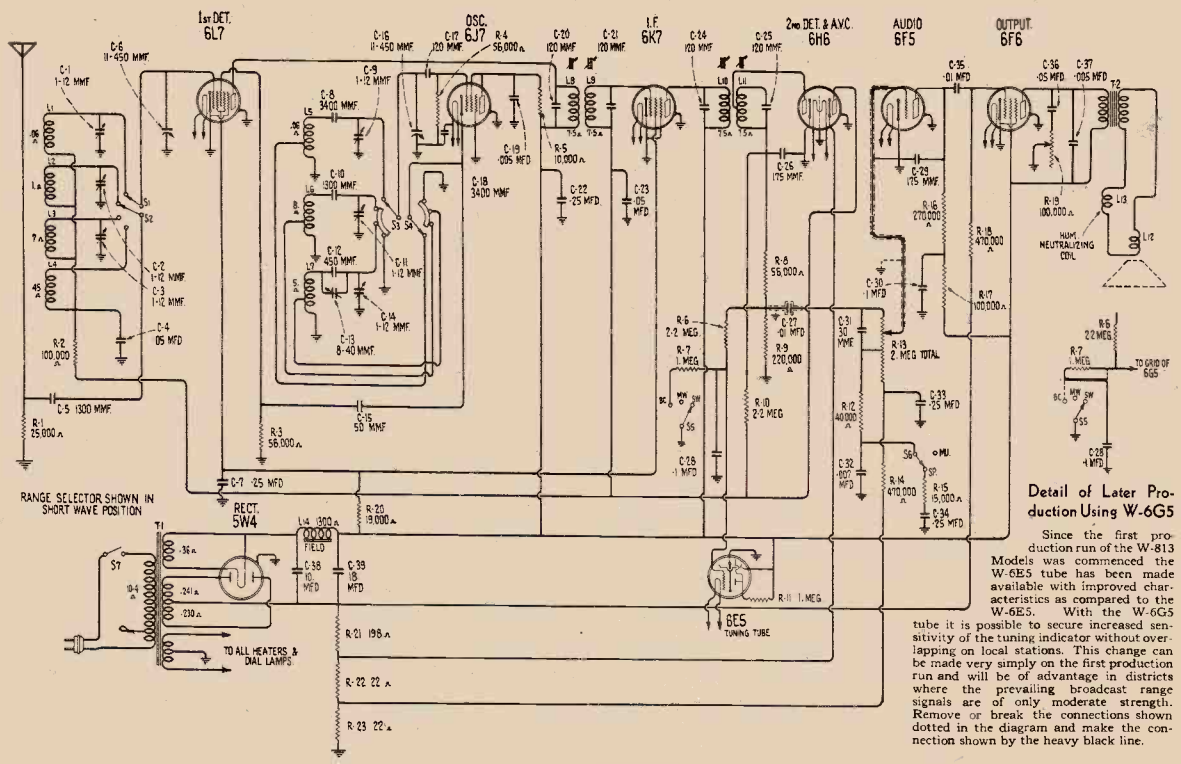
Loudspeaker:

The reproducer centering adjustment will be obvious if the field coil shield is removed. One screw in the centre of the back of the reproducer holds the shield in place. Two screws hold the voice coil centering spider in place and must of course be loosened while adjustment is being made.



Radiotron Socket Voltages and I.F. Trimmer Locations

SEE
MODEL 512
R.F. Alignment Points

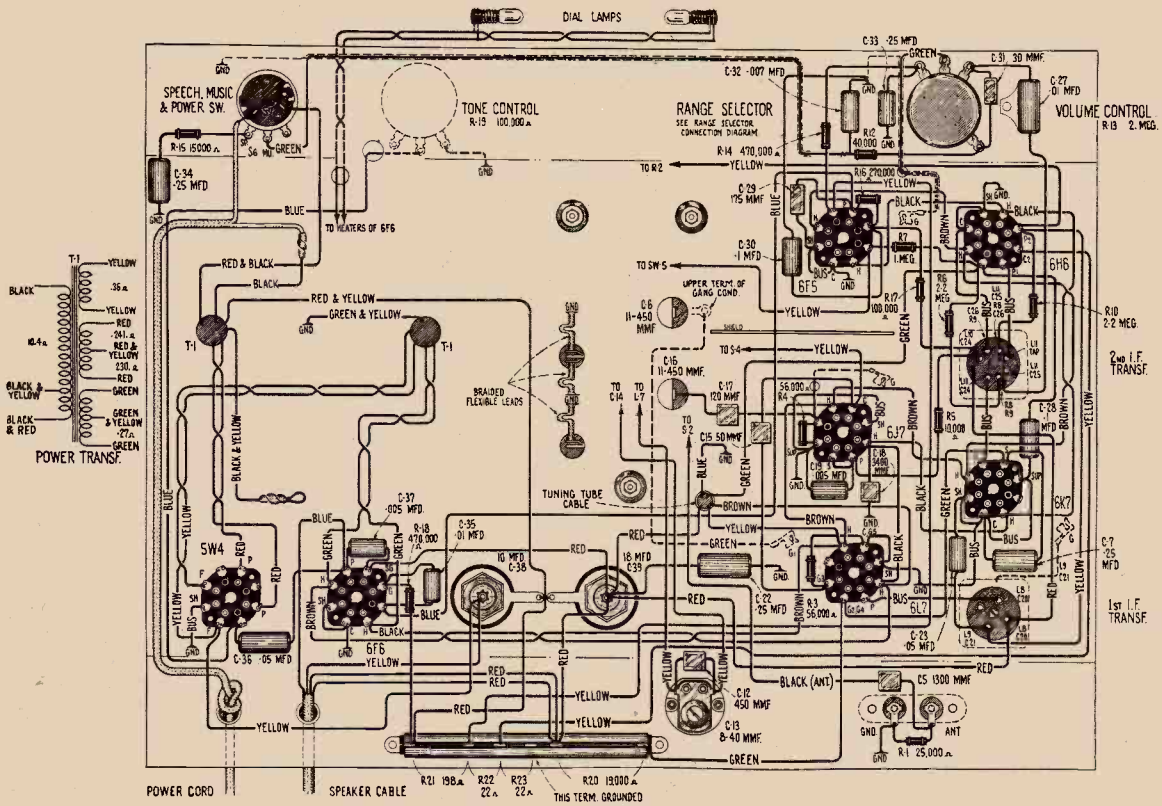


Detail of Later Production Using W-6G5

Since the first production run of the W-813 Models was commenced the W-6E5 tube has been made available with improved characteristics as compared to the W-6E5. With the W-6G5 tube it is possible to secure increased sensitivity of the tuning indicator without overlapping on local stations. This change can be made very simply on the first production run and will be of advantage in districts where the prevailing broadcast range signals are of only moderate strength. Remove or break the connections shown dotted in the diagram and make the connection shown by the heavy black line.

Schematic Circuit Diagram

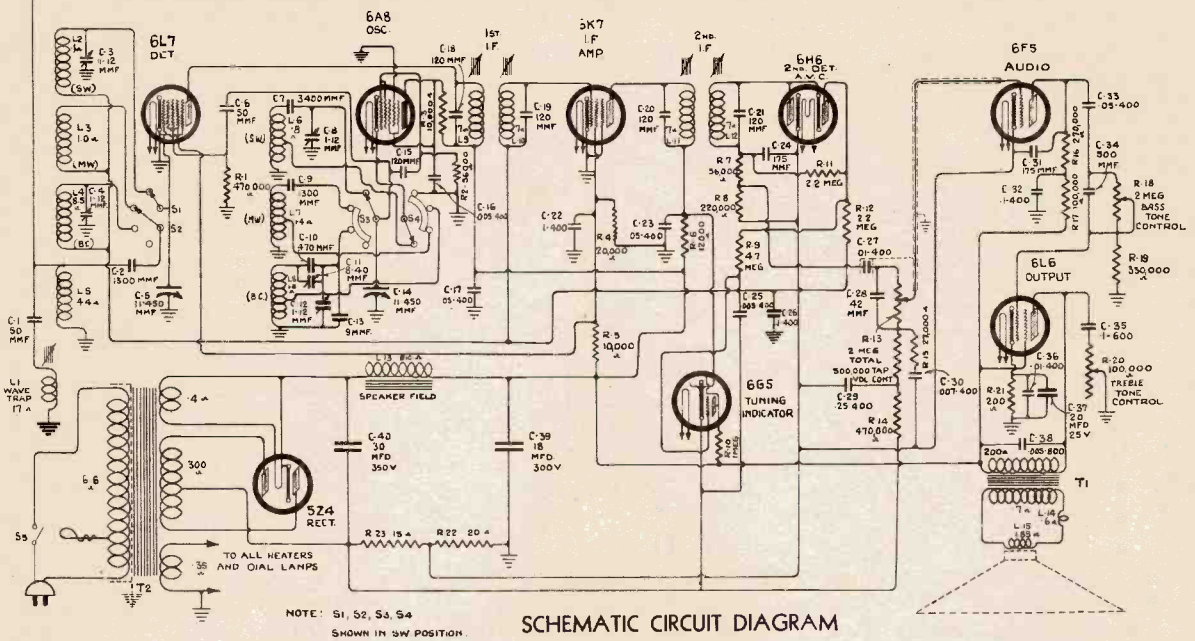
Note--On later production the heater winding is grounded at one side instead of at centre. Grounded point is terminal No. 7 on 6J7 socket. Two line filter condensers are used (H36176 0.02 Mfd.) also; one from each side of line transformer to ground.



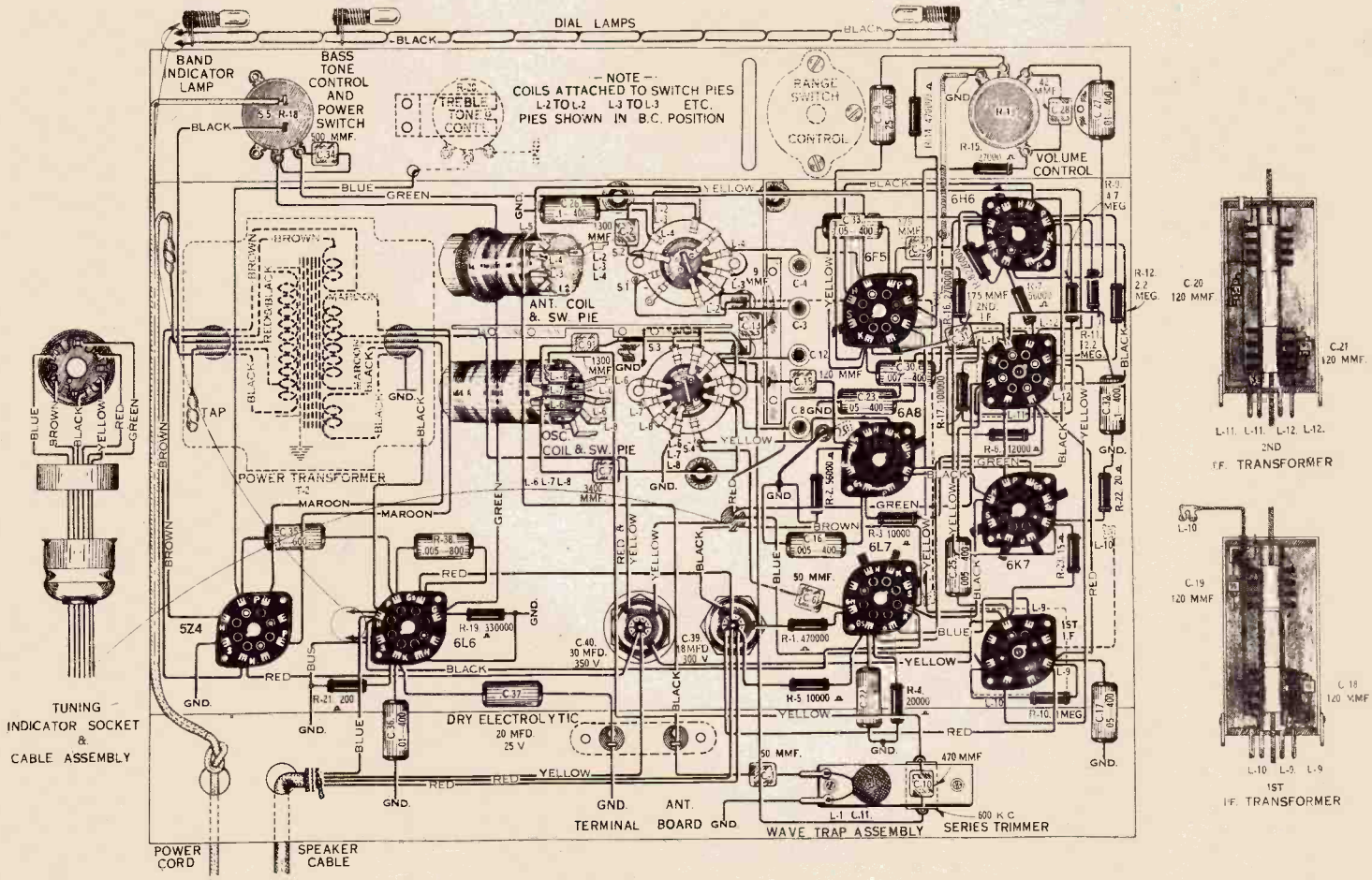
Wiring Diagram

See note under Schematic Circuit Diagram.

WESTINGHOUSE MODELS 823A, X, Y and Z



SCHEMATIC CIRCUIT DIAGRAM



Chassis Wiring Diagram

Note: It should be noticed in the diagram above that the square ended lugs projecting from the tube socket illustrations are soldered to the chassis frame.

WESTINGHOUSE MODELS 823A, X, Y and Z

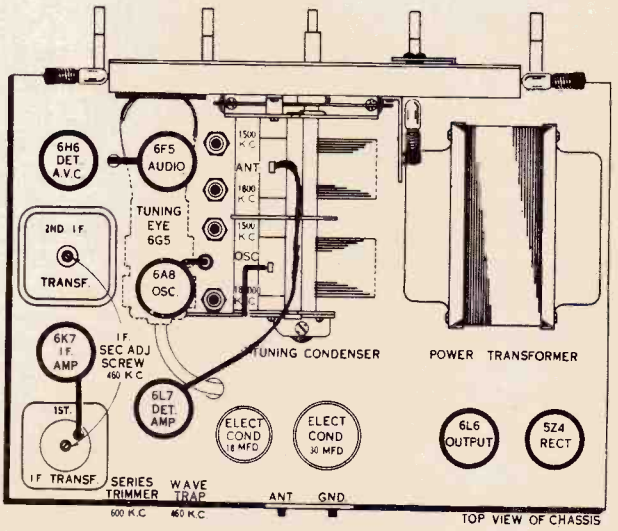
ALIGNMENT CHART

Order of Alignment	Connection To Receiver	Test Oscillator Dummy Antenna	Frequency Setting	Receiver Dial Setting	Circuit To Adjust	Adjustment Symbols	Adjust to Obtain
1	6K7 I.F. Grid Cap	.001 Mfd.	460 kc.	No signal 550-750 kc.	2nd. I.F. Transf.	L11, L12,	Max. (Peak)
2	6L7 Det.	.001 Mfd.	460 kc.	No. Signal 550-750 kc.	Ist. I.F. Transf.	L9,L10	Max. (Peak)
3	Ant. Term.	200 Mmfd.	460 kc.	No. Signal 550-750 kc.	Wave Trap	L1	Minimum Output
4	Ant. Term	300 ohms	18,000 kc.	18,000 kc.	S.W. Osc.	C8	Max. (Peak)**
5	Ant. Term.	300 ohms.	18,000 kc.	18,000 kc.	S.W. Ant.	C3	Max. (Peak)*
6	Ant. Term.	200 Mmfd.	1,500 kc.	1,500 kc.	B.C.H.F. Osc.	C12	Max. (Peak)
7	Ant. Term.	200 Mmfd.	1,500 kc.	1,500 kc.	B.C. Ant.	C4	Max. (Peak)
8	Term.	200 Mmfd.	600 kc.	Rock Through 600 kc.	B.C.L.F. Osc.	C11	Max. (Peak)

*If two peaks obtainable use higher capacity setting and check for image at 17,080 kc.
**If two peaks obtainable use lower capacity setting and check for image at 17,080 kc.

Trimmer Locations
AT RIGHT » »

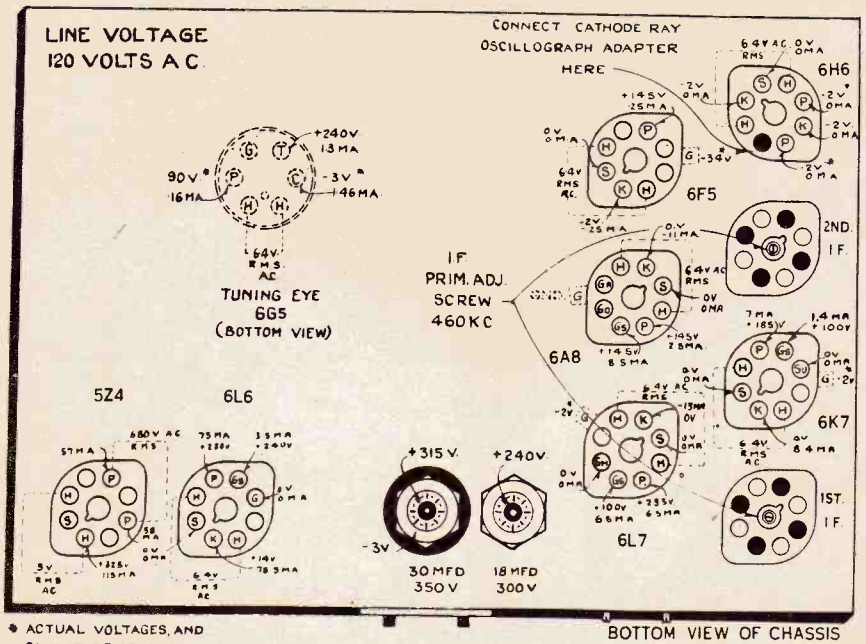
(also see Socket Meter Reading Diagram)



TOP VIEW OF CHASSIS

Socket Meter Readings
BELOW

The meter readings given in the diagram are taken with the antenna and ground binding posts short circuited and with 120 volts line. All readings are actual operating conditions and in some cases it will be necessary to allow for meter resistance. All D.C. voltage readings are taken with respect to the chassis frame. All readings are given for normal operation. If readings are taken with a set analyser, circuits that are not intended to oscillate, may oscillate, thus increasing plate or screen voltages and decreasing plate or screen current. The set analyser cable may also cause the oscillator radiotron to cease oscillating, thus increasing current and decreasing voltage.



* ACTUAL VOLTAGES, AND CANNOT BE READ ON ORDINARY VOLTMETER.

BOTTOM VIEW OF CHASSIS

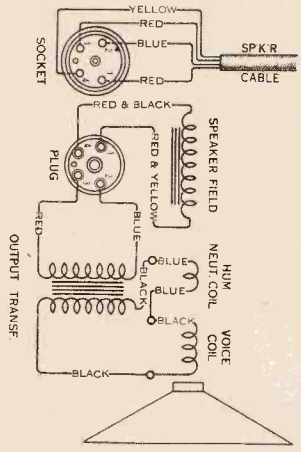
CONTROL GRID GROUNDING CAPS
USED ON LATER PRODUCTION WESTINGHOUSE MODEL 823

Due to certain changes in the design of W6A8 Radiotrons having been made, there is a possibility of a parasitic oscillation at high frequency being set up continuously in the W6A8 Radiotron in Model 823. This parasitic oscillation will result in a continuous hissing noise being heard in the receiver. Receivers now in the field with the former style W6A8 Radiotron will be satisfactory, but if the W6A8 Radiotron has to be changed for any reason, and is replaced with one of the latest design, it is possible that this undesired oscillation may result. If this occurs, order from the nearest Canadian Westinghouse Company, Limited, District Service Department, a control grid grounding cap S. No. H-38327, list price $ .25.

Some of the later production Model 823 receivers will be shipped already equipped with this control grid grounding cap. To install this part, simply cut off the present control grid lead to the W6A8 Radiotron, close to the chassis, and clip the grounding cap in place on top of the tube.

REPRODUCER USED ON LATER PRODUCTION, MODEL 823-Z

The reproducer used on the first production, Model 823-Z, was marked "S. No. H-38175." Later production used a speaker marked "S. No. H-38291." The parts of these speakers are not interchangeable



IMPORTANT INFORMATION ON REPLACEMENT PARTS

The first production run of these models (as will be noted from the chassis serial plates) are all designed to operate on either 25 or 60 cycles. 110 volts. It will be noted from the schematic circuit diagram and the chassis wiring diagram that there is no centre tap brought out on the heater winding of the power transformer. The replacement transformer (S. No. H36335) will however, have a centre tap, which should be taped up and not used when the transformer is installed on a chassis from the first production run.

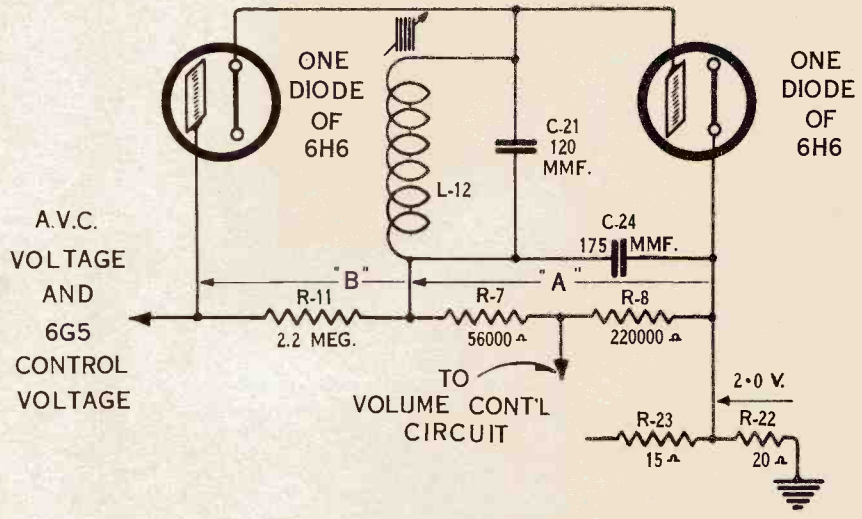
The second production run included some chassis which had a 60 cycle only power transformer. These are so marked on the chassis serial plate. This power transformer is S. No. H-38239, list price $6.90.

The power transformers on all of the second production run have a centre tap on the heater winding, which is connected to the chassis frame, and none of the heater contacts of the tube sockets are connected to the chassis frame as shown in the schematic circuit diagram and the chassis wiring diagram, but connected directly to the heater winding.

The 60 cycle transformer is smaller than the 25-60 cycle transformer and should it be necessary to install a 25 cycle transformer on a 60 cycle model, the service man will need to cut openings in the top surface of the chassis in the proper location to fit the larger transformer.

MODEL 823-Z LATE PRODUCTION

On some of the 823-Z's, the "IF" amplifier secures its plate supply from the positive end of the resistor R-6 instead of from the negative end of this resistor. This change reduces the total current flowing through the resistor R-6, decreases the voltage drop and increases the target voltage on the tuning indicator to give a more uniform color to the fluorescent screen.

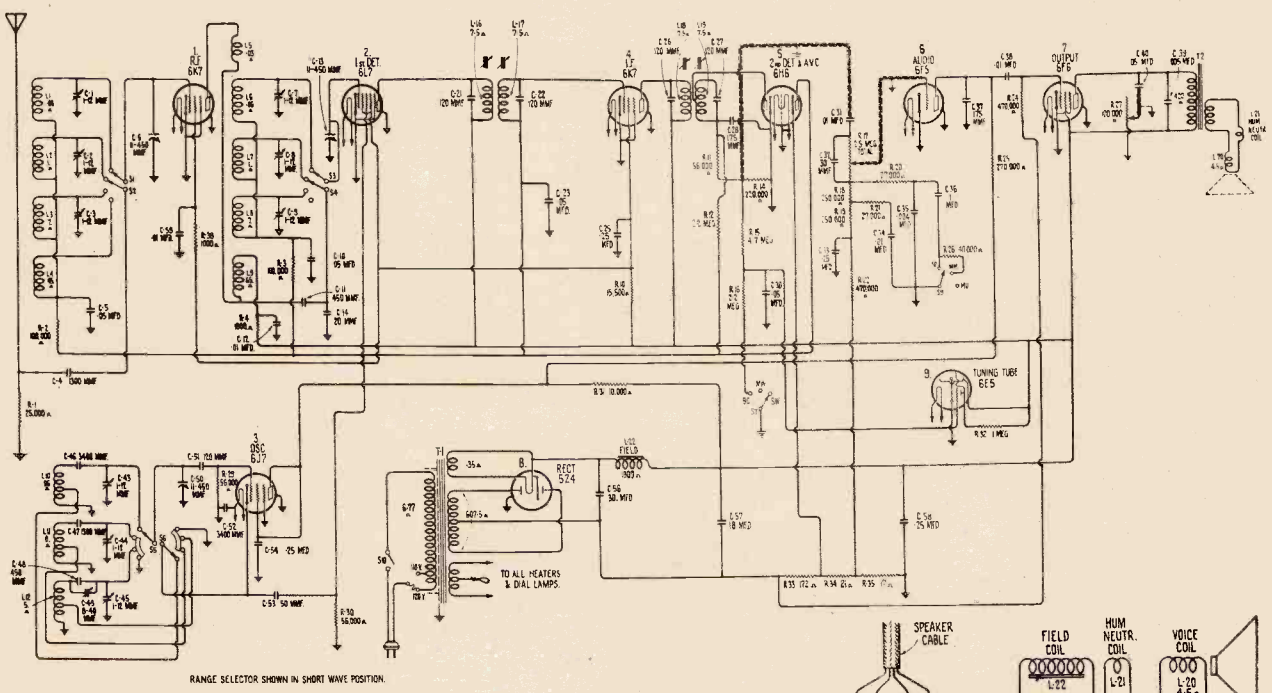


Detail of AVC Circuit

Note: (1) The A.V.C. and tuning indicator control voltage (with respect to chassis frame) is the sum of the voltage, A, and B, rectified by the two diodes of the W-6H6 plus the 2.0 volt residual bias from the voltage divider R-22, R-23.

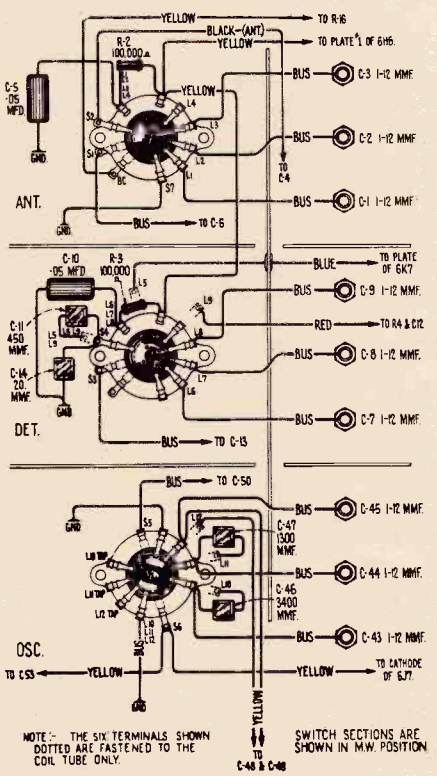
Note: (2) This use of the A.V.C. voltage doubling circuit is a new application for the W-6H6 Radiotron, and occasional Radiotrons may be found that are quite satisfactory for ordinary service but develop a hum when used in the Model 823. The remedy, of course, is to interchange W-6H6 Radiotrons and use the one removed from the Model 823 in some other model which does not use the voltage doubling A.V.C. circuit.

WESTINGHOUSE MODELS 914X & 914Y

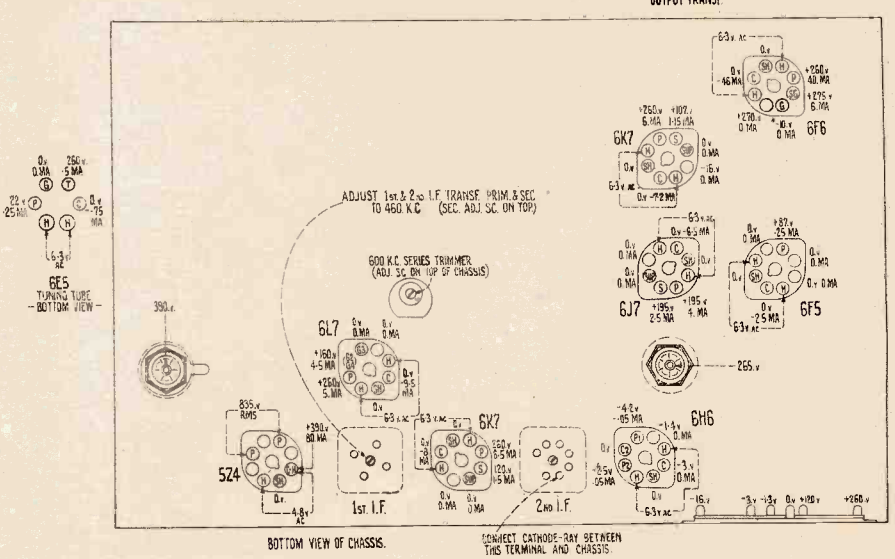


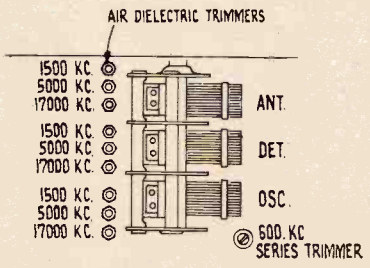
Schematic Circuit Diagram and Reproducer Wiring Diagram

Notes:— 1. On early production the heater winding was grounded at centre instead of at contact No. 2 on the W-6H6 socket. 2. The lower end of tone control R.27 was to positive plate supply terminal instead of to chassis frame. The wiring diagram is up-to-date.



Range Selector Wiring Diagram

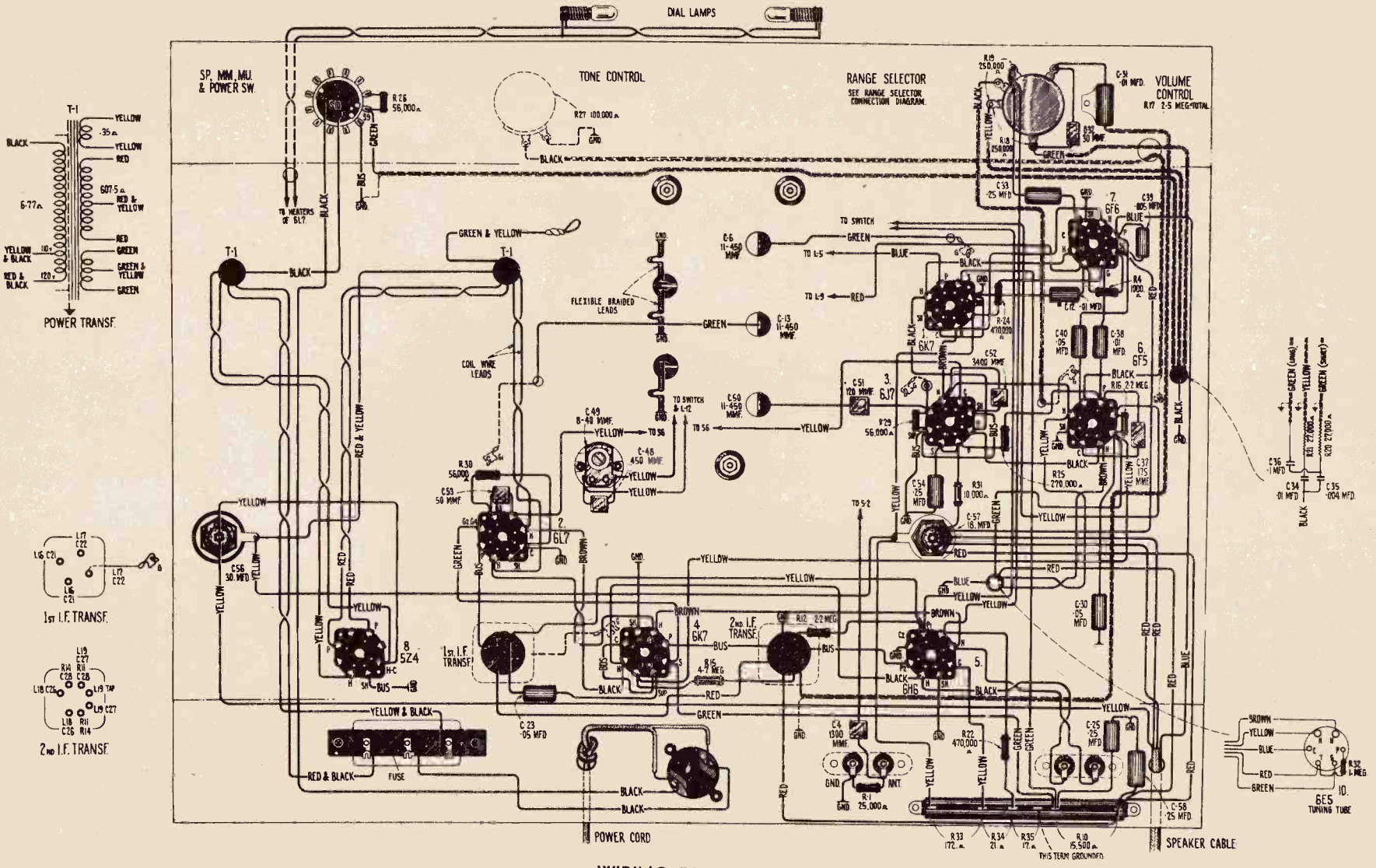




R.F. Alignment Points

When adjusting the Air Dielectric R.F. trimmers, it is necessary to use a special tool (See H-29644 in parts list) to slacken the lock nut on the trimmer, previous to the adjustment, and to tighten it again after the adjustment. Another special tool (See H-29643 in parts list) is available for making the actual adjustment to the trimmer. The adjustment should be made upward or downward on the plunger with a twisting motion. The special tool designed by the Canadian Westinghouse Company for this purpose is double ended; one end having a pin for the R.F. adjustments, the other end is a special socket screw driver for use in making I.F. adjustments.

WESTINGHOUSE MODELS 914X & 914Y



WIRING DIAGRAM

See notes under Schematic Circuit Diagram

823Z

B819A W813A

622A B826A

165A

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254A

64B

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W255A

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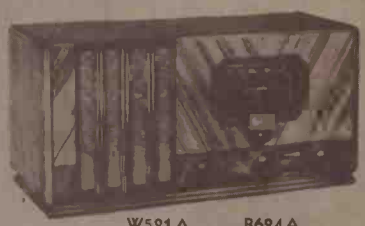
527A B725A



W521A B624A

B718A W512A

W511A

823A

420A B428A

B285A

B365A 155A

B265A

410A B517A

54C

54B

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44

CANADIAN WESTINGHOUSE

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