RCA VICTOR MODEL D 22-1

Twenty-Two Tube, Five-Band, A-C, Automatic Radio-Phonograph

SERVICE NOTES

Electrical Specifications

Frequency Ranges

Band X	140 kc.—	410 kc.
Band A	540 kc.—	1,800 kc.
Band B	1,800 kc.—	6,000 kc.
Band C	6,000 kc.—	18,000 kc.
Band D	18,000 kc.—	60,000 kc.

Alignment Frequencies

Band X	150 kc. (osc.), 400 kc. (osc., det., ant.)
Band A	600 kc. (osc.), 1,720 kc. (osc., det., ant.)
Band B	6,132 kc. (osc., det., ant.)
Band C	18,000 kc. (osc., det., ant.)
Band D	No adjustments necessary

Intermediate Frequency ..... **460 kc.**

Radiotron Complement

(1) RCA-6K7.....Radio-Frequency Amplifier
(2) RCA-6L7.....Hexode First Detector
(3) RCA-6J7.....Heterodyne Oscillator
(4) RCA-6K7.....First Intermediate Amplifier
(5) RCA-6K7.....Second Intermediate Amplifier
(6) RCA-6K7.....AVC Intermediate Amplifier
(7) RCA-6H6.....Automatic Volume Control
(8) RCA-6H6.....Diode Second Detector
(9) RCA-6C5.....Audio Voltage Amplifier
(10) RCA-6C5.....Audio Driver Amplifier
(11) RCA-6C5.....Audio Driver Amplifier
(12) RCA-6C5....Audio Driver Amplifier (Phono)
(13) RCA-5Z3.....Rectifier (Amplifier)
(14) RCA-5Z3.....Rectifier (Radio)
(15) RCA-6E5....."Magic Eye" Tuning Indicator
(16) RCA-2A3.....Power Output Amplifier
(17) RCA-2A3.....Power Output Amplifier
(18) RCA-2A3.....Power Output Amplifier
(19) RCA-2A3.....Power Output Amplifier
(20) RCA-6C5.....Audio Amplifier (Phono)
(21) RCA-6C5.....Audio Rectifier (Phono)
(22) RCA-6L7.....Audio Volume Expander

Power Supply Ratings

Rating A-6	105-125 Volts, 60 Cycles, 400 Watts
Rating A-5	105-125 Volts, 50 Cycles, 405 Watts
Rating B-4	105-125 Volts, 40 Cycles, 410 Watts
Rating B-3	105-125 Volts, 30 Cycles, 405 Watts
Rating B-2	105-125 Volts, 25 Cycles, 410 Watts

Phonograph

Type.....Automatic Record Ejector
Record Capacity.....Eight 10-inch or Seven 12-inch
Turntable Speed.....78 R.P.M.
Type of Pickup..Improved Low-Impedance Magnetic
Pickup Impedance.....18 Ohms at 1,000 Cycles

Power Output Ratings

Undistorted	20 Watts
Maximum	25 Watts

Loudspeakers (2)

Type	12-inch Electrodynamic
Voice Coil Impedance	7.5 Ohms at 400 Cycles
Field Coil Rating	1,700 Ohms—90 M.A.

Mechanical Specifications

Height	$43\frac{5}{16}$ inches
Width	$38\frac{1}{8}$ inches
Depth	$20\frac{5}{16}$ inches
Weight (Net)	269 pounds
Weight (Shipping)	353 pounds

General Description

The RCA Victor Model D 22-1 is an instrument of de luxe quality and performance. It consists of a thirteen-tube, five-band radio receiver; a six-tube, high-level power output amplifier; and a three-tube dynamic amplifier. An automatic phonograph is part of the assembly. Home recording facilities are provided so that recordings may be made direct of a radio program, or, by means of a microphone included with the equipment, of any desired speech or music. The high level of sound energy obtainable from the output of the instrument is capably handled by two of the new Super-Sensitive, twelve-inch, dynamic loudspeakers. The important features which make this instrument outstanding are as follows:—

Dynamic Amplifier

Limitations imposed by present methods of disc recording necessitate a constricted range of sound intensity which may be recorded. The *minimum* intensity of sound which may be recorded is determined by unavoidable record surface-noise which masks the recorded sound when such sound approaches down towards the intensity of the noise. The *maximum* sound intensity which may be recorded is determined by the thickness of the record groove-wall into which the record cutting stylus makes an impression of the original sound. The depth of cutting is, therefore, regulated so that the stylus will not break over into the adjacent groove. It is because of these upper and lower limits that the sound reproduction cannot be identical to the original sound which is produced in the recording studio. To keep the recorded sound within the limiting intensities, the recording control engineer regulates the recording amplifiers accordingly.

The dynamic amplifier of this reproducing instrument is designed to compensate for the recording limitations of intensity range. It serves to restore the original intensity relations of the recorded sound by varying the amplification of the reproducing amplifier in direct accordance with the average intensity value of the sound. Thus, when there is a prevailing rise in the intensity of the recorded sound, the dynamic amplifier increases in gain accordingly, and conversely when there is a prevailing tendency toward a decrease of the recorded sound, the dynamic amplifier decreases in gain. The functions of the dynamic amplifier are particularly advantageous in the reproduction of symphonic and certain other types of music where very great ranges of sound intensity are encountered. The dynamic amplifier causes the very loud or fortissimo and the very soft or pianissimo passages to be reproduced in their natural relations, although they may have been somewhat modified in the actual recording.

Power Amplifier

In order that the dynamic amplifier may bring about its designed purpose, the amplifier and reproducing system into which it works must have an undistorted range of amplification consistent with the degree of volume expansion provided in the dynamic amplifier. The power amplifier is, therefore, designed to have a maximum output of 25 watts. This unusually high level is obtainable from four RCA-2A3 Radiotrons which are arranged in a parallel push-pull Class "A" system. The two twelve-inch loudspeakers faithfully reproduce the amplified sound at all intensities from the minimum to the maximum.

Automatic Record Changer

An improved automatic mechanism is used in this model. It is of the record ejector type, having a record capacity of seven for the ten-inch type, and a capacity of eight for the twelve-inch type. The turntable speed is fixed at 78 r.p.m. by the design of the drive motor and the intermediate gear mechanism. *This speed is invariable and does not vary as long as the supply line frequency remains constant.* The instrument may be purchased with any one of five ratings as specified under Electrical Specifications. *It is very important that a machine of any particular rating be operated at the frequency for which it is designed and rated.* Attempts to operate at other frequencies will result in improper reproduction from the phonograph system. The ejecting mechanism is arranged so that it will trip on various types of records. This is obtained by having a trip mechanism which is actuated by the rate of needle acceleration toward the center of the record.

Magic Brain

The radio receiver includes the "Magic Brain" unit for maximum all-around efficiency. This unit is a scientifically correct co-ordination of all the parts for the r-f, oscillator, and first detector functions of a Superheterodyne Receiver. Such design of the important head end, or "Magic Brain" unit, gives greater efficiency in the short-wave ranges as all lead lengths are kept as short as possible, and all sockets and other parts are located for best possible operation.

Magic Eye

A cathode-ray tube whose fluorescent screen has the appearance of a human eye, is used for visually indicating when the receiver is accurately tuned to the incoming signal. This tube is of new design. It contains two groups of elements; one group operates as an amplifier and the other group operates as a cathode-ray tube.

The cathode-ray section consists of a conically shaped luminescent screen, a cathode, and a control electrode. The detected signal from the receiver is applied through the amplifier section of the tuning tube to the control electrode of the cathode-ray section. This control electrode, in turn, affects the electron stream emitted by the cathode in such a manner as to cause a triangular shadow on the luminescent screen. The size of the shadow caused by the control electrode is determined by the strength of the incoming signal, so that a change-of-tuning is readily exhibited on the cathode-ray screen, and therefore tuning to exact resonance can be definitely obtained.

RCA All-Metal Tubes

The new metal tubes are used in the radio receiver

unit, in the dynamic amplifier unit, and in one stage of the power amplifier unit. These tubes make possible a greater range of stable amplification not previously attainable with corresponding glass types. Their metal envelopes form a perfect electrostatic and electromagnetic shield, precluding the former necessity for elaborate shielding by means of cans. The metal tubes are especially adaptable to the modern, extended-range receivers because of their efficient shielding and their favorable internal characteristics.

Selector Dial

The dial drive and station indicator system are of unique design. There are five individual dial scales, each with full 180 degree band spread, one for use on each of the five tuning bands. These scales are eccentrically arranged on a rotary disc which operates in conjunction with the range-selector switch, so that as the switch is shifted to a particular band, the corresponding dial scale rotates into position, leaving the remaining four scales concealed. The driving mechanism for the dial pointer and the variable gang-condenser has tuning ratios of 10 to 1 and 50 to 1. Control may be interchanged between these two ratios by a push-pull operation of a positive-action clutch which is actuated by the tuning control knob. A vernier dial with an auxiliary pointer (band-spreader) is provided for the accurate tuning required for short-wave reception. The vernier pointer is geared to the main dial-shaft through a mechanism which causes it to rotate twenty times to a single rotation of the main dial-pointer. The dial-drive mechanism connects to the variable gang-condenser by means of a flexible coupling. This coupling arrangement together with the new shock-proof condenser mounting makes possible the rigid attachment of the drive mechanism to the receiver-chassis base without causing serious microphonic coupling between the base and the tuning condenser.

Electrical Circuits

The circuits of this instrument are arranged so that for the radio function, the incoming signal is amplified and detected in the normal process and is then transmitted to the power output amplifier through a driver stage which is part of the radio chassis. The phonograph function is accomplished through a system which includes the dynamic amplifier, a separate driver stage, and the same power amplifier as used for radio. These circuits are controlled by means of a ganged rotary-switch which is attached to the motor board in the record-playing compartment. An indicating system of pilot lamps behind engraved windows, readily displays to the operator the position of the change-over switch. It is to be noted that the dynamic amplifier works only in conjunction with the phonograph function. A control is included so that "dynamic amplification" may be eliminated if desired by the listener. The following features of electrical design are of particular importance:

Dynamic Amplifier

The purpose of this unit has been previously described. Electrically, it consists of an RCA-6L7 operating as an audio expander, an RCA-6C5 operating as an audio amplifier which, in turn, feeds another RCA-6C5 operating as an audio rectifier. The audio signal obtained from the magnetic pick-up is boosted by the input transformer and then fed to the paralleled inputs of the RCA-6L7 expander and the RCA-6C5 audio amplifier. Compensation filters are associated with the input-transformer circuit to correct the frequency response of the reproducing system so as to compensate for the recording characteristic. The signal from the input transformer is supplied to the first control-grid of the RCA-6L7 through the manual volume-control potentiometer (R-218), and is simultaneously applied through the expander control (R-204) to the control-grid of the first RCA-6C5. The signal applied to this latter tube is first amplified and then fed to the RCA-6C5 audio-rectifier stage. This latter stage rectifies the audio signal by operating as a diode. Its output is of the nature of a pulsating direct current, the amount varying in direct relation with the average value of intensity of the audio signal. The pulsating voltage due to rectification in the RCA-6C5 appears across resistor (R-207) and is applied through a delay filter (R-202 and C-203), to an auxiliary control-grid of the RCA-6L7. The value of the bias on this auxiliary control-grid determines the amplification of the RCA-6L7 expander stage. The gain of the dynamic amplifier is, therefore, automatically regulated by the average intensity of the audio signal.

Power Amplifier

The power amplifier unit contains four RCA-2A3 Radiotrons and a single RCA-5Z3 rectifier Radiotron. The amplifier tubes are arranged in parallel push-pull and are operated with fixed bias. Their grids are coupled to the radio chassis directly through a coupling transformer (T-3). The same grids are coupled to the phonograph driver-stage (RCA-6C5) through another transformer (T-102). There are two power transformers in the power-supply system; one supplying the high voltage necessary for the plate circuits, and the other supplying the heater voltages for the tubes of the power amplifier and dynamic amplifier. The home-recording level-indicator lamps are supplied from the plate circuit of the power-amplifier stage. The high level of audio energy from the output stage is delivered to the two heavy-duty, super-sensitive, electrodynamic loudspeakers through a step-down matching transformer. Suitable switching is incorporated in the voice-coil circuit for connecting in the pickup as a cutting-head for home recording.

Automatic Signal Stabilizer

The heterodyne oscillator circuit used in the radio receiver is an improved type having exceptional frequency stability and uniformity of output over its various tuning ranges. It operates on fundamental frequencies and the output is fed to the first-detector hexode tube (RCA-6L7) on an auxiliary mixing grid. The oscillator signal is at all times above the frequency

of the incoming signal by 460 kc. As shown by the schematic diagram, the cathode of the oscillator tube is above ground potential for r.f. while the plate is effectively at ground potential. This particular arrangement, together with the plate and screen series resistors, makes the circuit independent of supply voltage variations in regard to stability and uniformity of output. Separate oscillator coils are used for each of the tuning ranges. The switching between the ranges is such as to short-circuit certain unused coils which would absorb energy from the operative coils because of their natural tuning in the band being used.

Automatic Sensitivity Booster

The sensitivity on the short-wave bands, B, C, and D is higher than that of bands A and X. This difference is necessary because of the weaker signal strength normally encountered in the short-wave bands as compared to those of the longer-wave bands. Change in sensitivity from band to band is accomplished by variations of the fixed d-c bias on the r-f and i-f tubes. This change is automatically made by the range switch when it is rotated.

Automatic Volume Control

The a.v.c. operates as a parallel system, being fed from the i-f output through an auxiliary amplifier tube, an RCA-6K7. This stage has an untuned input and broadly resonated output, accomplished by the natural-period fourth i-f transformer. A double-diode RCA-6H6 operates as the a.v.c.-detector. It receives the incoming signal at 460 kc. from the a.v.c. i-f stage and rectifies it. This causes a signal d-c component to appear across the diode load resistor (R-37). This d-c component is applied to the control-grid of the r-f, first detector, and i-f tubes through resistor-condenser filters. The value of the bias obtained by this process is in accordance with the intensity of the received signal and governs the amplification of the r-f, first detector, and i-f stages, thereby maintaining the same level of input to the second-detector stage whenever there are fading tendencies, and similarly when tuning from station to station. For a given percentage of modulation, therefore, and within the range of the automatic-volume-control system, a constant output level will be obtained at the output of the receiver.

Band D Tuning

Special notice should be taken of the manner of tuning the ultra-high-frequency band of this receiver. The r-f stage is unused when the range switch is turned to its Band D position and the signal is fed directly from the antenna to the first-detector grid circuit. The inductance of the circuit consists of a short length of bus wire to which the antenna lead is attached at a definite predetermined point. The total length of this inductive wire, from the stator of the tuning capacitor to ground, represents the secondary of a high-frequency autotransformer, while the inductive section included between the antenna lead-tap and ground forms the primary. Alteration of the dimensions and position of this wiring will change the tuning and alignment of the circuit, resulting in poor operation or complete failure of operation. *It is therefore necessary when servicing to avoid any changes in the wiring which includes Band D detector and oscillator r-f circuits. If unavoidable, the arrangement must be restored to its exact original condition.* Similar caution should be observed when exchanging by-pass condensers in these same circuits, since their values, physical position, length of leads, quality of dielectric, etc., are critical, and variation will definitely affect operation of the receiver. The small heater by-pass condensers and ground terminals at the tube socket are very important in this respect.

Power Supply

The voltages for the radio receiver and plate voltage for the dynamic amplifier are supplied separately from

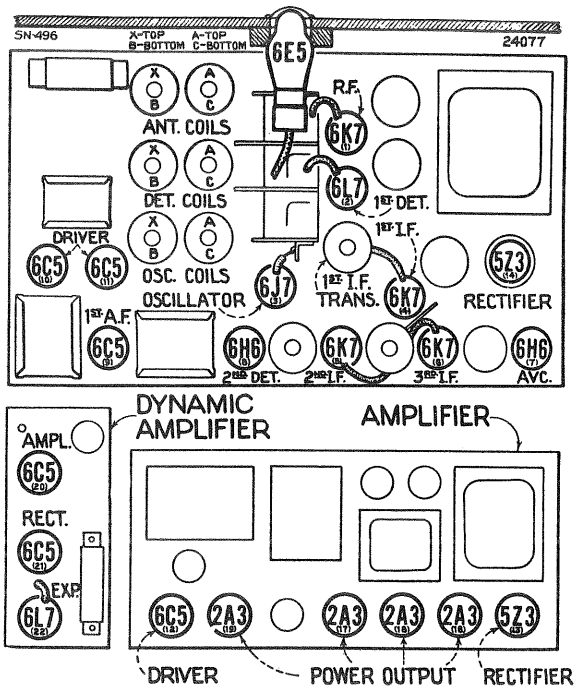


Figure 1—Radiotron and Coil Locations

a power transformer and an RCA-5Z3 rectifier stage. The voltages for the power amplifier and the filament voltages for the dynamic amplifier are supplied from two power transformers and a single RCA-5Z3 rectifier tube.

An efficient electro-static shield is placed in each of the power-supply transformers to isolate the primary and secondary for radio frequency. This isolation prevents r-f disturbances which are on the supply line from entering the receiver circuit and causing interference, and at the same time eliminates the tendency of the receiver to re-radiate into the line.

Compensated Volume Controls

Manual volume control of the radio is by means of an acoustically tapered potentiometer which conveys the audio output of the first a-f stage to the interstage coupling transformer. This control has tone compensation produced by filters connected to two points

thereon. These filters give the correct aural balance at different volume settings. A music-speech control is provided in one of the volume control filter circuits for use in obtaining good speech intelligibility. On the speech position, the low-frequency tones are reduced. The phonograph volume control is likewise compensated at two points. A high-frequency tone control is connected from grid to grid of the RCA-6C5 driver tubes of the radio chassis to enable reduction of static and incidental noises which interfere with reception. Two tone controls are used in the phonograph system, one of which (left-hand in record compartment when facing cabinet) reduces low-frequency response (*maximum lows — counter-clockwise,*) and the other (right-hand) reduces high-frequency response (*maximum highs — clockwise*). Each is continuously variable and may be adjusted by the listener to produce the balance of tone which is most pleasing.

SERVICE DATA

The various diagrams of this booklet contain such information as will be needed to isolate causes for defective operation when such develops. The values of the various resistors, capacitors, coils, etc., are indicated adjacent to the symbols signifying these parts on the diagrams. Identification titles such as R-3, L-2, C-1, etc., are provided for reference between the illustrations and the Replacement Parts List. These identifications are in a sequence which begins at the left of the diagram (antenna) and they increase numerically from left to right as a signal would proceed through the circuit, thus facilitating location of such parts on the schematic diagram. The coils, reactors, and transformer windings are rated in terms of their d-c resistance only. Resistances of less than 1 ohm are generally omitted.

Alignment Procedure

Fourteen alignment trimmers are provided in the r-f, first detector, and oscillator tuning system and six are used in the i-f system. All of these are accurately adjusted during manufacture and should remain in proper alignment unless affected by abnormal conditions of climate or have been altered by other means. Loss of sensitivity, improper tone quality and poor selectivity are the usual indications of improper alignment.

Correct performance of the receiver can only be obtained when the trimmer adjustments have been made by a skilled service man with the use of adequate and reliable test equipment. Such apparatus as may be required for alignment of this particular instrument is illustrated and described on a separate page of this booklet.

The extensive frequency range of this receiver necessitates a more or less involved method of alignment. However, if the following directions are carefully applied, normal performance of the instrument will be obtained.

Two methods of alignment are applicable. One utilizes a cathode-ray oscillograph as a means of output indication and the other follows former procedure where a glow-type indicator, or meter, is used. The oscillographic method is much to be preferred, since greater accuracy is possible from the type of indication afforded. There are no approximations necessary as with the meter or aural methods, but each adjustment can be made with definite precision. Both methods are hereinafter outlined so that the alignment operations may be made in accordance with the equipment available.

It is wise to determine the necessity for alignment, as well as the direction of mis-alignment before making adjustments. The RCA Tuning Wand is an instrument designed particularly for such a purpose.

Its use is outlined as follows:—

The Tuning Wand consists of a bakelite rod having a small brass cylinder at one end and a core of finely divided iron at the other. It may be inserted into a tuned coil while a signal of the normal resonant frequency is being supplied to such a coil in order to obtain an indication of the accuracy of the tuning. Holes are provided at the top of r-f shield-cans for entrance of the Wand. The presence of either end of the Wand will cause a change in tuning which will be indicated at the receiver output as an increase or decrease in signal level. If there is a decrease of output when either end is inserted, the tuning is correct and will require no adjustment. However, should there be an increase of output due to the iron core and a decrease with the brass cylinder, an increase in inductance or capacitance is indicated as necessary to bring the circuit into alignment. The trimmer involved should, therefore, be increased in capacitance. If the brass-cylinder end causes an increase in output while the iron end causes a decrease, reduction of inductance or capacity will be necessary to place the circuit in alignment. Therefore, the associated trimmer should be decreased in capacitance. The following tabulation gives the various changes and the adjustments required:

Wand	*Signal*	*Trimmer*
Brass	Decrease	None
Iron	Decrease	
Brass	Increase	Decrease
Iron	Decrease	
Brass	Decrease	Increase
Iron	Increase	

CATHODE-RAY ALIGNMENT

Equipment

A standard source of alignment frequencies is required. Such a source should consist of an RCA Full-Range Oscillator, Stock No. 9595. Output indication should be by means of an RCA Cathode-Ray Oscillograph, Stock No. 9545. An RCA Frequency Modulator, Stock No. 9558, will be needed to sweep the generated signal and synchronize it with the Oscillograph in order to obtain visual representation of the resonant characteristic of the circuit being tuned on the cathode-ray fluorescent screen.

I-F Trimmer Adjustments

Six trimmers are associated with the three i-f transformers. Their locations on the chassis are shown by Figure 4. Each must be aligned to a basic frequency of **460 kc.** The last i-f transformer should be adjusted first, the one preceding it second and the operation carried through successive stages until the first transformer has been aligned. For such a process, it is necessary to feed the output of the Full-Range Oscillator to the stages in their order of alignment, adjusting the trimmers of each and observing the effect at the second-detector output on the Cathode-Ray Oscillograph. The most convenient point for connection of the Oscillograph is at the control-grid of the RCA-6C5 first audio tube, with the vertical "Hi" input terminal attached to the grid connection and the "Gnd" to the chassis. The "Ext. Sync." terminals of the Oscillograph should be connected to the Frequency Modulator as illustrated in Figure 2. A .001 mfd. capacitor installed in series with the Oscillator "Ant." output lead will prevent the voltage constants of the stage being aligned, from becoming upset.

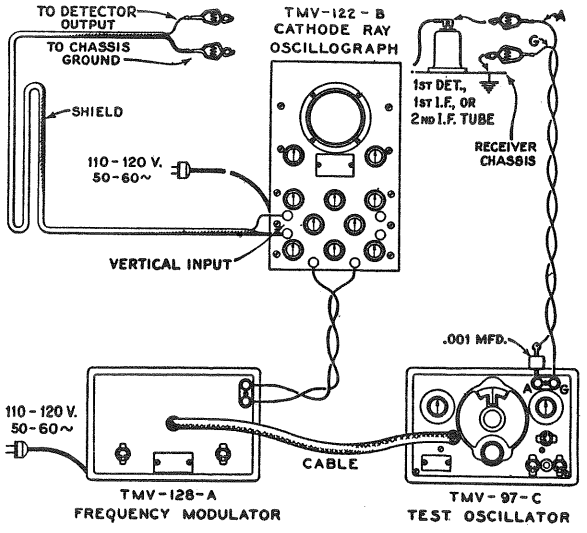


Figure 2—Alignment Apparatus Connections

The vertical "A" amplifier should be "On" for the ensuing adjustments and its gain control kept at maximum. For each adjustment, the Oscillator output must be regulated so that the image obtained on the Oscillograph screen will be of the minimum size convenient for accurate observation. Proceed further as follows:—

(a) Place the Receiver, Oscillograph, and Test Oscillator in operation. Set the receiver range switch to Band "A" and tune the station selector to a point where no interference will be encountered from signal pickup or from the RCA-6J7 oscillator, removing the tube if necessary. Set the Oscillograph horizontal "B" amplifier to "Timing" and control its gain so that the luminescent spot sweeps a straight line trace completely across the screen. Place the timing control to "Int." Adjust the intensity and focusing controls of the Oscillograph to produce the correct size and strength of spot.

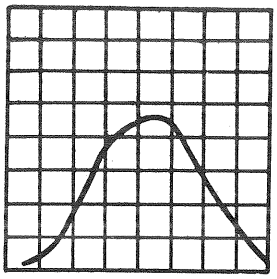
(b) Attach the output of the test Oscillator between the control-grid cap of the second i-f tube (RCA-6K7) and chassis ground as shown typically by Figure 2. Tune the Oscillator to **460 kc.** and set its modulation switch to "On." Regulate its output until the signal produces a wave pattern on the Oscillograph screen, adjusting the Oscillograph controls to give a shape which is convenient for peak indications. Cause the image to stand still on the screen by manipulation of the frequency and synchronizing controls. Then carefully tune the two trimmers C-44 and C-45 of the third i-f transformer to produce maximum amplitude (vertical deflection) of the oscillographic image. Under this condition the transformer will be sharply resonated to 460 kc.

(c) The Frequency Modulator should then be placed in operation and interconnected with the Full-Range Oscillator by means of the special shielded patch cord. Figure 2 shows the proper arrangement. Set the Frequency Modulator sweep-range switch to its "Lo" position and turn the Oscillator modulation switch to "Off." Change the timing control of the Oscillograph to "Ext." and place the range switch to its No. 2 position. Then carefully shift the tuning of the Oscillator so as to increase its frequency, until two distinct and similar waves appear on the Oscillograph screen and become exactly coincident at their highest points. This condition will be found to occur at an Oscillator setting of *approximately 540 kc.* The curves will be identical in shape but appearing in reversed positions. Adjust the frequency control of the Oscillograph in order to cause the waves to conform with the above requirement and to make them remain motionless on the screen. This will require a setting of approximately ½ clockwise rotation of the frequency control. The trimmers C-44 and C-45 should then be re-adjusted so that the two curves move together and become exactly coincident throughout their lengths, maintaining the maximum amplitude at which this condition can be brought about.

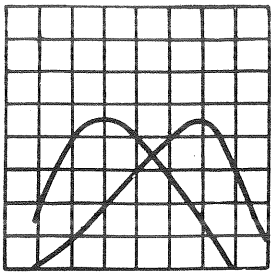
(d) Leaving the equipment connected and adjusted as above, change the Oscillator output to the control-grid cap of the first i-f tube (RCA-6K7). Adjust the two trimmers C-37 and C-38 of the second i-f transformer until the forward and reverse waves appearing on the Oscillograph coincide throughout their lengths and have maximum amplitude.

(e) Change the test Oscillator output to the control-grid of the first detector tube (RCA-6L7) without disturbing the connections and adjustments of the other apparatus. Then align the trimmers C-32 and C-33 of the first i-f transformer to produce waves of maximum coincidence and maximum amplitude. The shape of the composite wave obtained from this operation is a true representation of the over-all tuning characteristic of the i-f system.

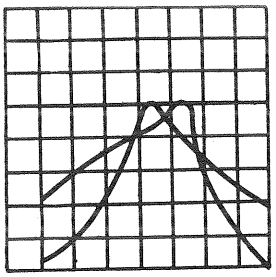
CURVES OF 3RD I-F TRANSFORMER



Trimmers C-44 and C-45 Correctly Aligned

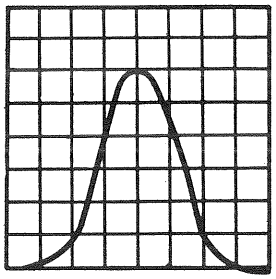


Trimmer C-44 Increased or Decreased 1/8th turn

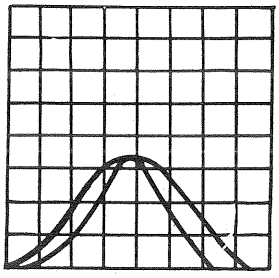


Trimmer C-45 Increased or Decreased 1/8th turn

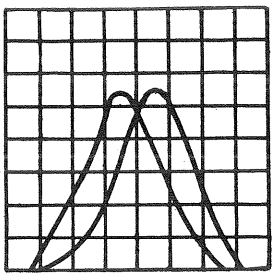
CURVES OF 2ND AND 3RD I-F TRANSFORMERS



Trimmers C-37 and C-38 Correctly Aligned

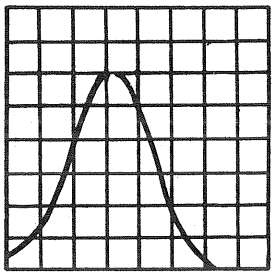


Trimmers C-37 or C-38 Increased 1/8th turn

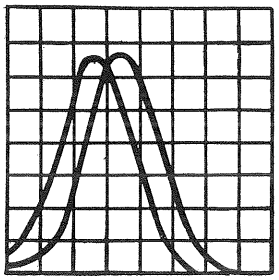


Trimmers C-37 or C-38 Decreased 1/8th turn

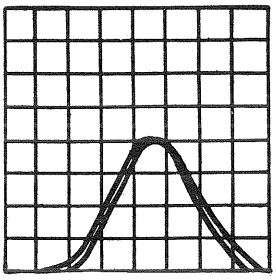
CURVES OF 1ST, 2ND AND 3RD I-F TRANSFORMERS



Trimmers C-32 and C-33 Correctly Aligned



Trimmers C-32 or C-33 Increased 1/8th turn



Trimmers C-32 or C-33 Decreased 1/8th turn

Figure 3—Cathode-Ray Images for I-F System

R-F Trimmer Adjustments

For Bands A and X, adjustments must be made at the high and low frequency ends of the range. On Bands B and C, alignment is required only at the high frequency end. Band D is permanently adjusted during manufacture, hence no alignment will be necessary in this range. Locations of the various antenna, detector, and oscillator trimmers are shown on Figure 4. The test Oscillator should be removed from connection with the i-f system and its output attached to the antenna-ground terminals of the receiver. No changes are to be made in the attachment of the Oscillograph at the second detector. During the adjustments, the Oscillator output should be regulated as often as is necessary to keep the oscillographic image as low as is practically observable. Adherence to this procedure will obviate apparent broadness of tuning which would result from a.v.c. action on a stronger signal. The sequence of alignment should be Band A, Band X, Band B, and Band C. Proceed with the adjustments as follows:—

Calibration

Set the receiver range switch to Band A and rotate the station selector until the tuning condenser plates are in full mesh (maximum capacitance). Then move the main dial pointer until it points exactly to the horizontal line at the low frequency end of the Band A scale. Correct the setting of the vernier second hand pointer to read zero.

BAND A

(a) With the receiver range switch in its Band A position, tune the station selector until the dial pointer is at a reading of **1720 kc.** Adjust the test Oscillator to **1720 kc.** (modulation "On" and Frequency Modulator disconnected) and increase its output to produce a registration on the Oscillograph. Carefully align the oscillator, detector, and antenna trimmers, C-25, C-14, and C-3 respectively, so that each brings about maximum amplitude of output as shown by the wave on the Oscillograph. It will be necessary to have the timing control of the Oscillograph on "Int." for this operation. After each trimmer has been peaked, the Oscillograph timing control should be set to "Ext." and the Frequency Modulator placed into operation with its connections to the Oscillator and Oscillograph made in accordance with Figure 2. Turn the modulation switch of the Oscillator to "Off" and retune the Oscillator (increase frequency) until the forward and reverse waves show on the Oscillograph and become coincident at their highest points. Adjust the trimmers C-25, C-14, and C-3 again, setting each to the point which produces the best coincidence and maximum amplitude of the wave images.

(b) Remove the Frequency Modulator cable from the Oscillator and shift the signal frequency to **600 kc.** Place the modulation switch to "On". Tune the receiver to pick up this signal, disregarding the dial reading at which it is best received. Then insert the Frequency Modulator plug and retune the Oscillator (modulation "Off") until the two similar forward and reverse waves appear on the screen. For this adjustment, it is advisable to shift the Oscillator to its 200-400 kc. range using the third harmonic of the generated signal in order to obtain the desired range of sweep. The oscillator series trimmer, C-23, should then be adjusted to produce maximum amplitude of the images. No rocking will be necessary on the station selector inasmuch as the signal frequency is being "wobbled" by the Frequency Modulator to produce the same effect. After completing this adjustment, the trimmer C-25 should be re-aligned as in (a) to correct for any change brought about by the adjustment of C-23.

BAND X

(a) Disconnect the Frequency Modulator and tune the test Oscillator to a frequency of **400 kc.** (Modulation "On"). Place the receiver range switch in its Band X position and turn the station selector until the dial pointer reads **400 kc.** Adjust the Oscillograph timing control to "Int." Then align each of the trimmers C-26, C-15, and C-4 to the point producing maximum output at the Oscillograph. Place the Frequency Modulator in operation and attach it to the Oscillator in the normal manner. Change the Oscillograph timing to "Ext." Increase the frequency of the Oscillator (modulation "Off") until the two waves appear and become coincident at their highest points, *approximately at 462 kc.* They may be made to remain stationary on the screen by manipulation of the Oscillograph range switch and frequency control. Readjust the three trimmers C-26, C-15, and C-4 to give maximum amplitude and complete coincidence of the waves.

(b) Change the test Oscillator so that it delivers a signal of **150 kc.** with the Frequency Modulator disconnected. Tune this signal on the receiver which has previously been set to Band X, disregarding the dial reading at which the signal is best received. Then interconnect the Frequency Modulator with the Oscillator and retune the latter to the point at which the two similar waves appear on the screen. Adjust trimmer C-27, for maximum amplitude of the wave images. Rocking of the tuning condenser will not be necessary as the Frequency Modulator duplicates such an operation. Repeat the alignment of C-26 as outlined in (a) to correct for any reflective error brought about by the adjustment of C-27.

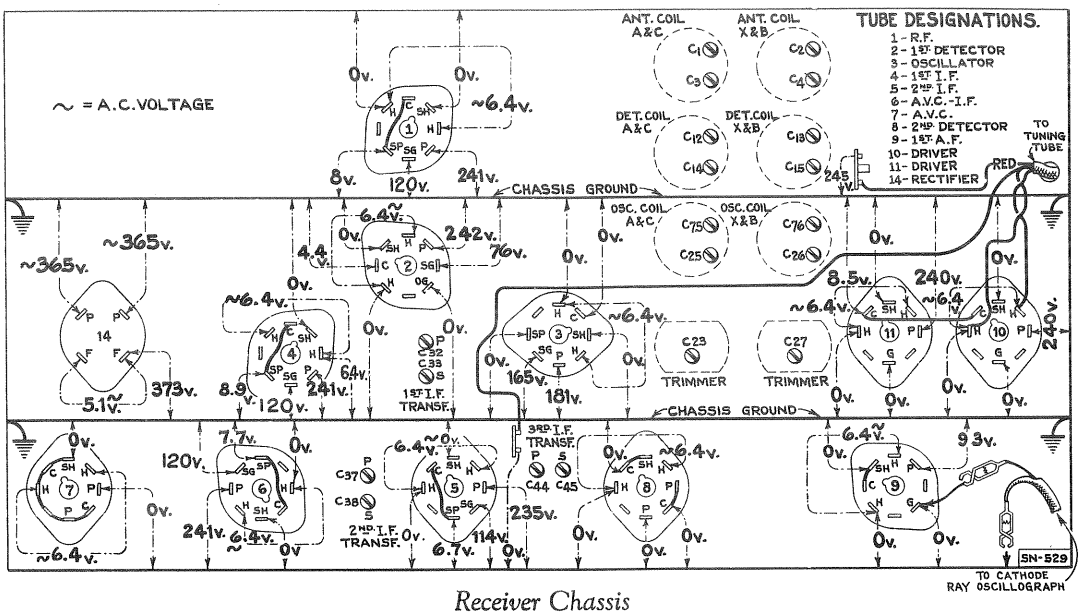
BAND B

(a) Advance the receiver range switch to its Band B position and tune the station selector to a dial reading of **6132 kc.** Set the test Oscillator to **6132 kc.** (modulation "On" and Frequency Modulator disconnected) and increase its output until a suitable indication is apparent on the Oscillograph. The Oscillograph should be adjusted for "Int." timing. Then adjust the oscillator trimmer, C-76, to the point at which maximum amplitude of the image is obtained. Two positions will be found for this trimmer which gives such a maximum. The one of least capacitance is correct and should be used. This can be checked by tuning the "image" signal, which will be received at **5212 kc.** on the dial if the adjustment of C-76 has been properly made. An increase in the test Oscillator output may be necessary for this test. *Its frequency should not be changed from* **6132 kc.** *nor any trimmer adjustments made on the receiver.*

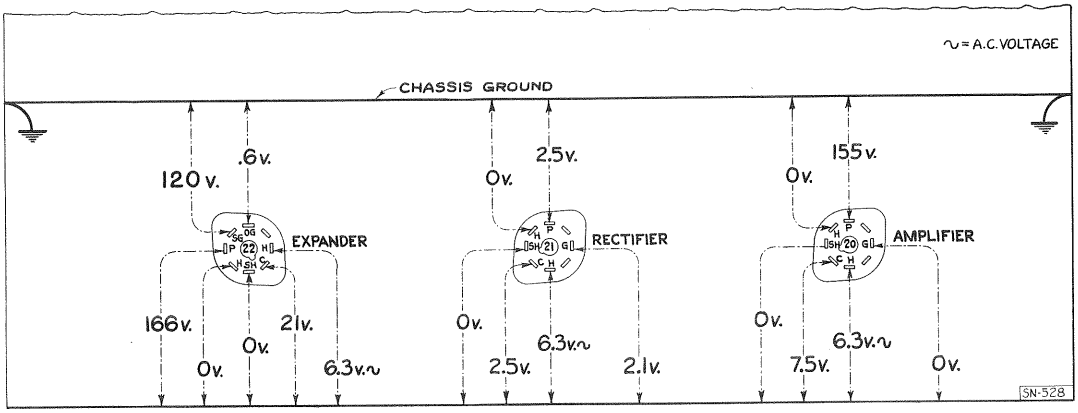
(b) Return the station selector to the **6132 kc.** reading and align the detector, and antenna coil trimmers, C-13 and C-2 respectively, for maximum (peak) output as shown by the Oscillograph. No further adjustments are to be made on this band.

BAND C

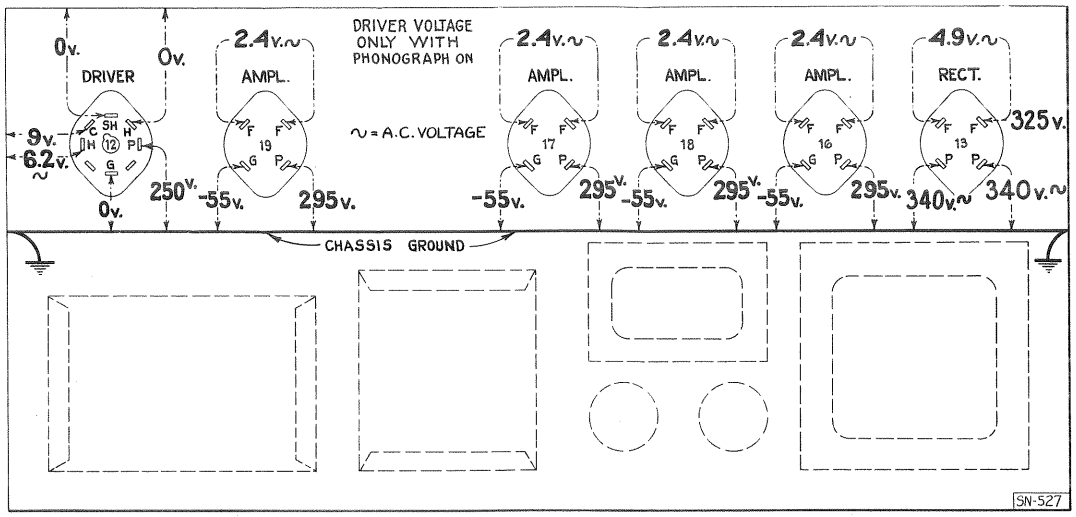
(a) Turn the range switch of the receiver to its Band C position and tune the station selector until the dial pointer reads **18,000 kc.** Set the test Oscillator to **18,000 kc.** (Modulation "On" and Frequency Modulator disconnected), regulating its output to the level required for convenient observation. Adjust trimmer C-75 to the point producing maximum output as indicated on the Oscillograph. Check for the presence of "image" signals by tuning the receiver to **17,080 kc.** The **18,000 kc.** signal of the



Receiver Chassis



Dynamic Amplifier



Power Amplifier

Figure 4—Radiotron Socket Voltages
Measured at 115 volts, 60 cycle supply—No signal being received

Oscillator will be received at this point if the adjustment of C-75 has been properly made, using the position of minimum capacitance giving maximum receiver output. It may be necessary to increase the output of the Oscillator in order to get an indication of the "image". *No adjustments should be made during this check.*

(b) Return the receiver tuning to **18,000 kc.**, realign C-75 if necessary, and then adjust the detector and antenna trimmers C-12, and C-1 for maximum signal output as evidenced by the oscillographic image. No further adjustments are to be made on Band C.

BAND D

No adjustments are required on this band.

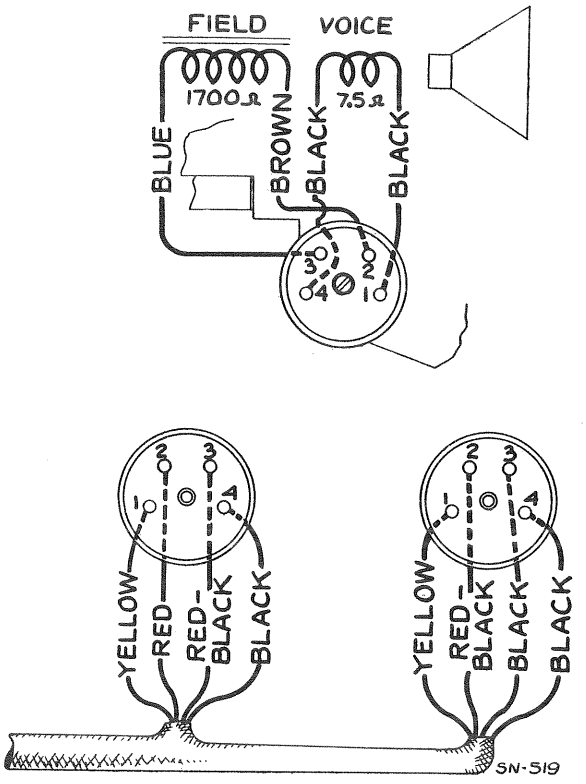


Figure 5—Loudspeaker Wiring

OUTPUT METER ALIGNMENT

To align the receiver by other methods than that explained above will require the use of a standard test oscillator, such as the Stock No. 9595, and a suitable output indicator, such as the Stock No. 4317. The indicator should be connected either to the voice coil circuit or across the output transformer primary. For each adjustment, the volume control should be maintained at maximum and the Oscillator output regulated until the indication is barely perceptible. The smaller the amount of glow, the more accurate will be the indication. The signal level will also be below the range of the receiver a.v.c., preventing broadness of tuning.

I-F Adjustments—Connect the output of the test Oscillator from the RCA-6L7 first detector control-grid to chassis-ground and adjust its frequency to **460 kc.** Tune the receiver to Band "A", setting the station selector at a point where no interference is received from local stations or the local oscillator. Then tune the i-f trimmers C-45, C-44, C-38, C-37, C-33, and C-32 in order, each for maximum indicated receiver output.

R-F Adjustments—Connect the Oscillator output to the antenna-ground terminals of the receiver. Keep the output indicator attached to the receiver output as above. For each adjustment, use the minimum signal which will give a perceptible indication on the glow indicator.

BAND A

(a) Set the range switch of the receiver to its Band A position and tune the selector to a dial reading of **1720 kc.** Tune the Oscillator to this same frequency and adjust trimmers C-25, C-14, and C-3 to produce maximum indicated receiver output.

(b) Shift the Oscillator to **600 kc.** and tune the receiver to pick up this signal, disregarding the dial reading at which it is best received. Then adjust trimmer C-23, simultaneously rocking the tuning control backward and forward through the signal, until maximum output is obtained from the combined operations. Repeat the alignment of C-25 as in (a) to correct for any change caused by adjustment of C-23.

BAND X

(a) Change the range switch to its Band "X" position. Tune the receiver to read **400 kc.** and set the Oscillator to produce this same frequency. Adjust trimmers C-26, C-15, and C-4 to produce maximum receiver output.

(b) Shift the Oscillator frequency to **150 kc.** and tune the receiver to pick up this signal, disregarding the dial reading at which it is best received. Then tune the oscillator series trimmer, C-27, simultaneously rocking the tuning control (receiver) backward and forward through the signal, until maximum output results from the combined operations. Repeat the alignment of C-26 as in (a) to correct for any change caused by the adjustment of C-27.

BAND B

Place the receiver range switch in its Band "B" position and tune the station selector to a dial reading of **6132 kc.** Set the frequency of the Oscillator to **6132 kc.** Then adjust trimmer C-76 to give maximum receiver output. Two positions may be found which fulfill this condition. The one of least capacitance is correct. To assure that the right peak has been used, tune the *receiver* to **5212 kc.** and increase the Oscillator output. The "image" of **6132 kc.** will be received at this point if C-76 has been adjusted to the proper point of maximum output. *No trimmer adjustments are to be made during this check.* Return the receiver tuning to **6132 kc.**, readjust C-76 if necessary, and then tune the detector and antenna coil trimmers, C-13 and C-2 to produce maximum (peak) receiver output as indicated on the glow meter.

BAND C

Turn the receiver range switch to its Band "C" position and set the tuning control to a dial reading of **18,000 kc.** Tune the Oscillator to this same frequency. Adjust the oscillator parallel trimmer C-75 to produce maximum receiver output. Two positions of the trimmer will be found which fulfill such a condition. The one of least capacitance is correct. To assure that the right position has been used, check for the "image" of the **18,000 kc.** signal which will be received at **17,080 kc.** on the dial if C-75 is correctly adjusted. An increase in Oscillator output may be necessary. *No trimmer adjustments should be made during this check.* Return the receiver tuning to **18,000 kc.**, readjust C-75 if necessary, and then tune the detector and antenna trimmers, C-12 and C-1 to give maximum receiver output.

Dial Adjustment

Figure 6 illustrates the relations of the various parts of the dial mechanism when it is in its A—Broadcast position and the range switch is likewise turned to its Band A setting. In re-assembling the dial after repairs, see that the gears are meshed in accordance with the diagram, at the same time noting that the lever which is attached to the range-switch shaft is in the position as shown.

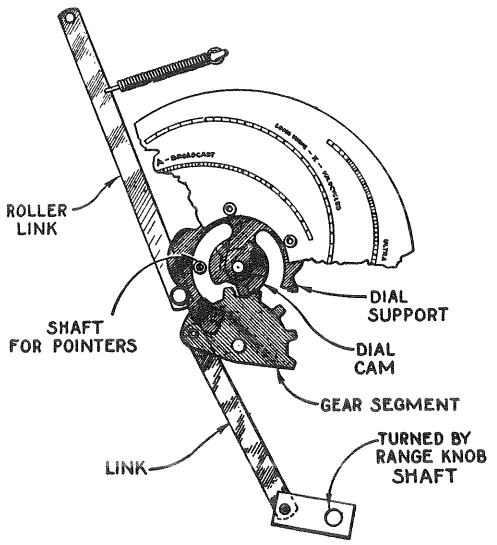


Figure 6—Selector Dial Change Mechanism

Radiotron Socket Voltages

The voltage values indicated from the Radiotron socket contacts to ground and appearing across the heaters (H-H) on Figure 4 will serve to assist in locating causes for faulty operation when existent. Each value as specified should hold within ± 20% when the receiver is normally operative at the rated supply voltage. Variations in excess of this limit will usually be indicative of trouble in the basic circuits.

The voltages given on this diagram are actual measured voltages, and are the results obtained after the loading of the circuit, by the voltmeter, has taken place.

To fulfill the conditions under which these d-c voltages were measured it requires a 1,000-ohm-per-volt voltmeter having ranges of 30, 300, and 600 volts.

For all d-c voltages under 30, measure on the 30-volt scale; all d-c voltages between 30 and 300, measure on the 300-volt scale; and all d-c voltages between 300 and 600, measure on the 600-volt scale.

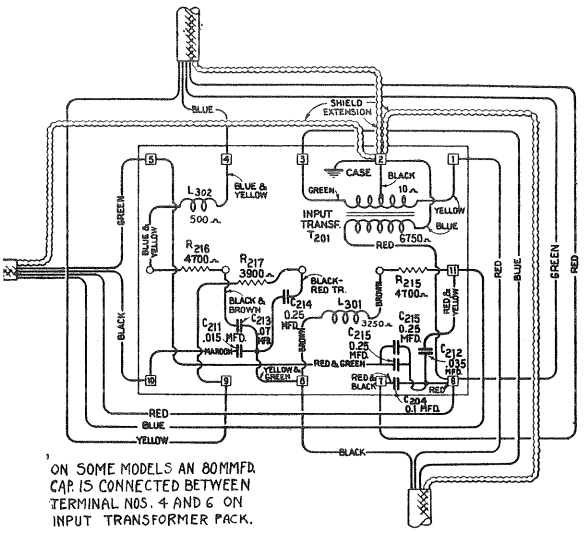


Figure 7—Input Transformer Wiring

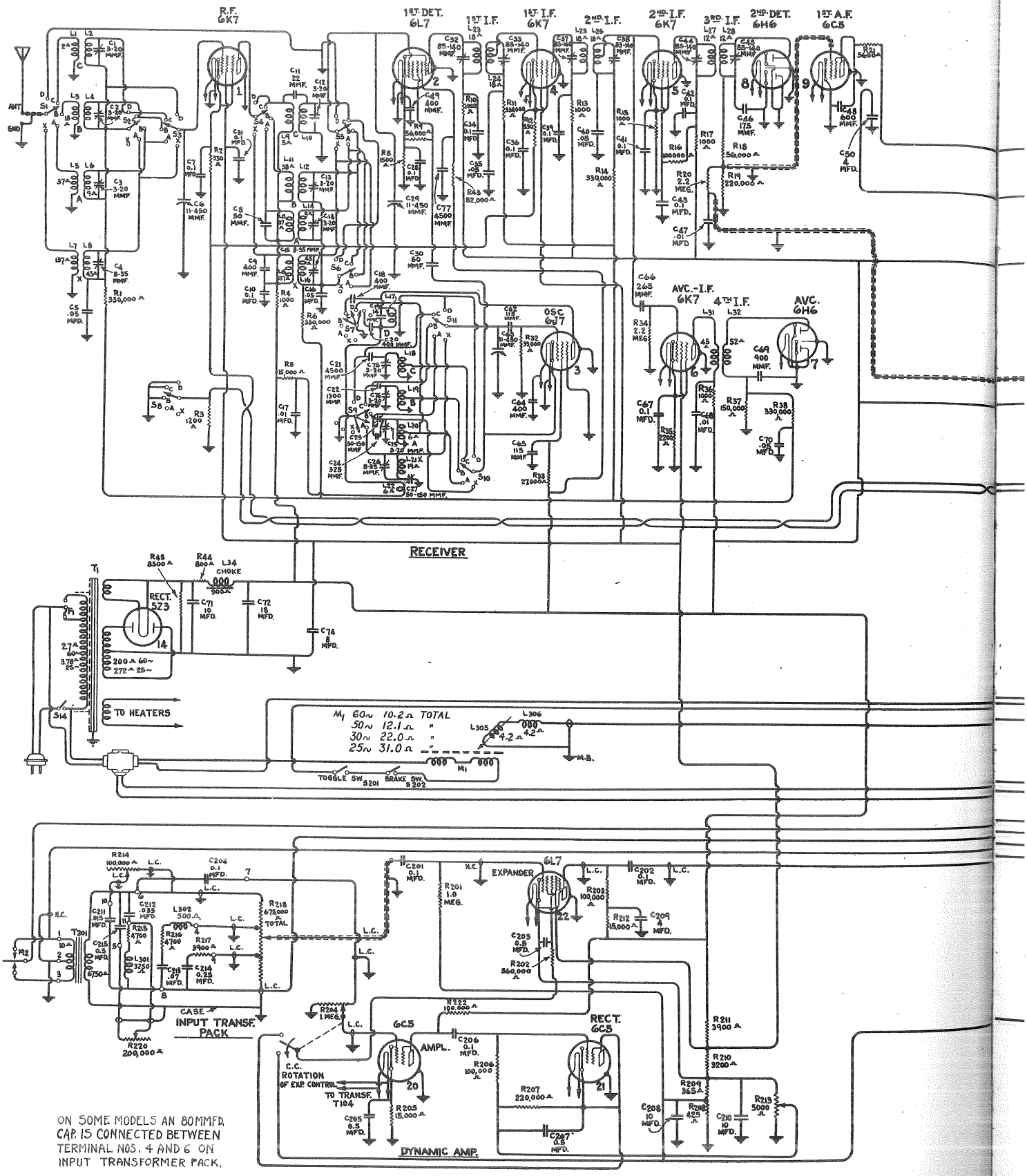
For meters of the 1,000-ohm-per-volt type, but ranges other than above, use the nearest ranges to those specified. If the range is higher the voltage *may be* higher, and if the range is lower the voltage *may be* lower; either condition depending on the percentage of circuit current drawn by the meter.

Dynamic Amplifier

It is essential that the correct voltages and currents exist at the RCA-6L7 audio expander stage in order that the expanding function may take place in the proper manner. A screw-driver adjustment (see Figure 14) is accordingly provided for regulating the fixed bias of the RCA-6L7 auxiliary grid so that the plate current may be adjusted to the correct value under a no-signal condition. This current should be adjusted to a value of 0.10—0.13 ma. with no signal input to the dynamic amplifier and with a normal voltage of 275 volts appearing across the resistance-divider system (R-211, R-210, R-209, and R-208).

A substitute method for adjusting the RCA-6L7 no-signal characteristic is by means of a voltmeter having an internal resistance of 600,000 ohms (600 volt range, 1,000-ohms-per-volt). This voltmeter should be used to set the plate (of the RCA-6L7) to chassis voltage. The plate voltage as indicated by the specified meter should be adjusted to exactly 195 volts, with a power line supply-voltage of 115 volts.

An indication of the operation of the dynamic amplifier may be obtained by playing a record which has predominating loudness. Such a record is Victor Red Seal Record No. 8651, "Die Fledermaus"—Over-


R.F. 6K7
1ST DET. 6L7
1ST I.F.
1ST I.F. 6K7
2ND I.F.
2ND I.F. 6K7
3RD I.F.
2ND DET. 6H6
1ST A.F. 6C5
OSC 6J7
AVC.-I.F. 6K7
4TH I.F.
AVC. 6H6
RECEIVER
RECT. 5Z3
CHOKE
TO HEATERS
M1 60~ 10.2Ω TOTAL
50~ 12.1Ω "
30~ 22.0Ω "
25~ 31.0Ω "
TOGGLE SW. S201
BRAKE SW. S202
M.B.
EXPANDER 6L7
AMPL. 6C5
RECT. 6C5
INPUT TRANSF. PACK
CASE
C.C. ROTATION OF EXP. CONTROL
TO TRANSF. T104
DYNAMIC AMP.
ON SOME MODELS AN 80 MMFD. CAP. IS CONNECTED BETWEEN TERMINAL NOS. 4 AND 6 ON INPUT TRANSFORMER PACK.

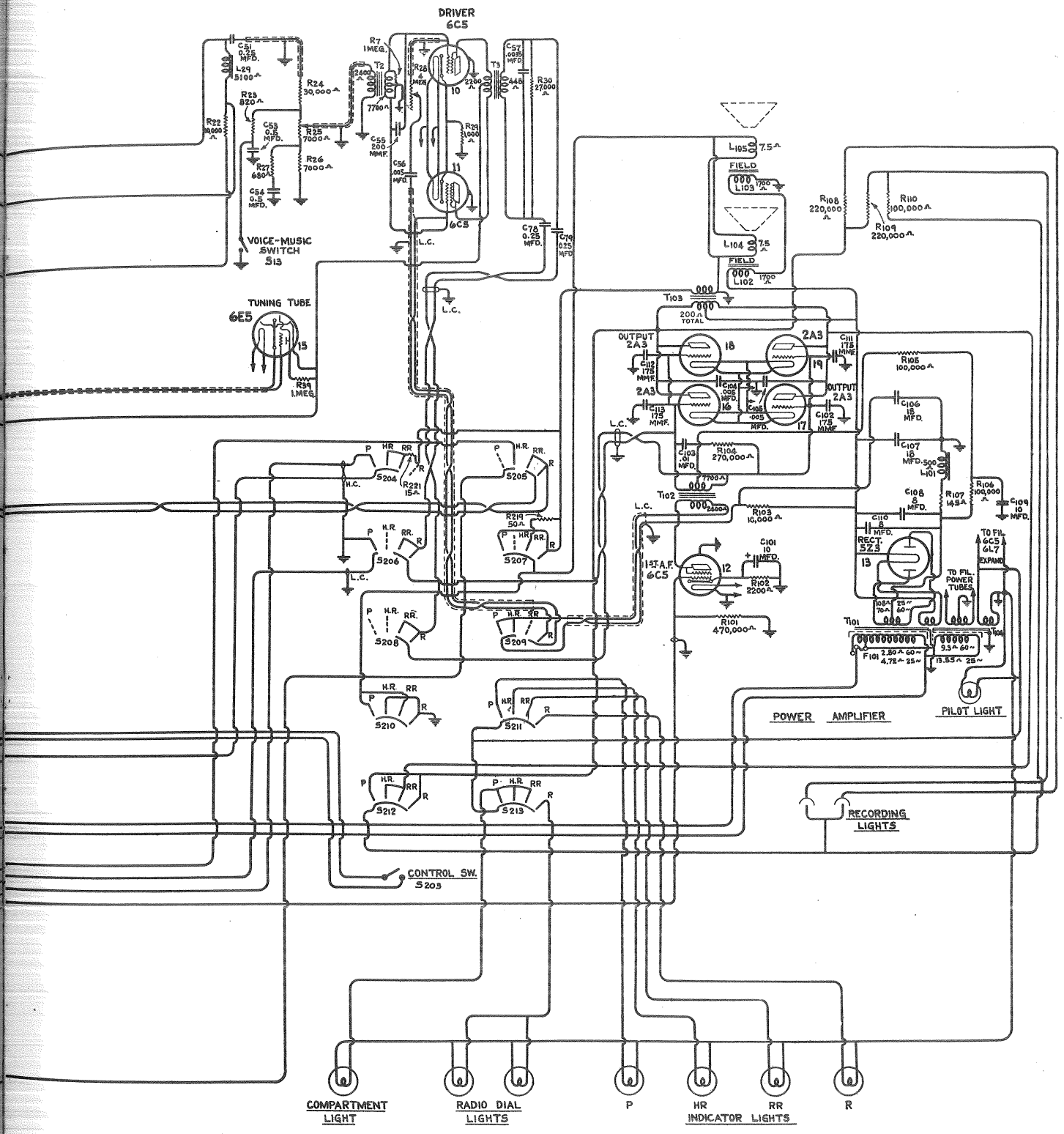
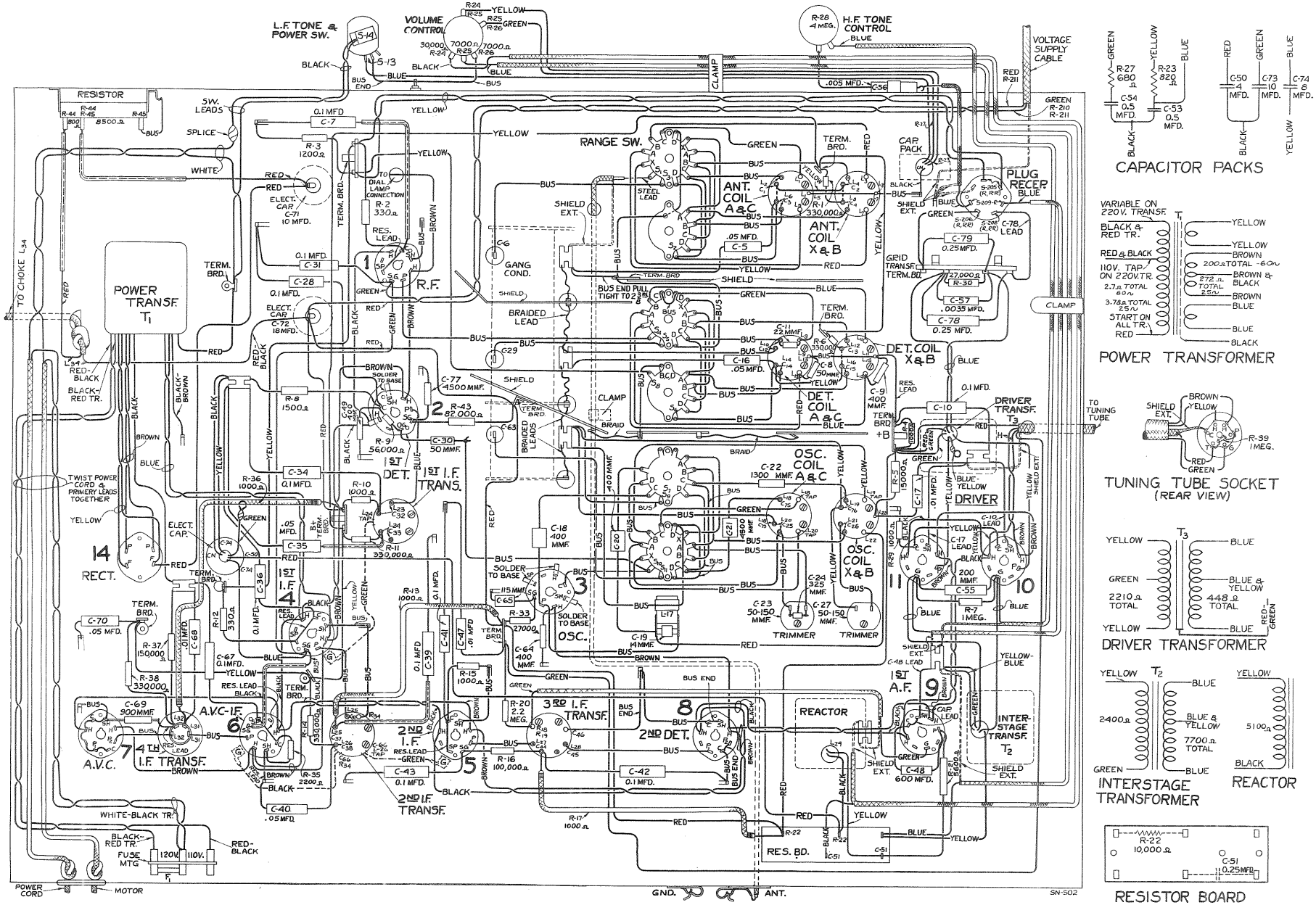


Figure 8—Schematic Circuit Diagram



CAPACITOR PACKS

POWER TRANSFORMER

TUNING TUBE SOCKET (REAR VIEW)

DRIVER TRANSFORMER

INTERSTAGE TRANSFORMER

REACTOR

RESISTOR BOARD

Figure 9—Chassis Wiring Diagram

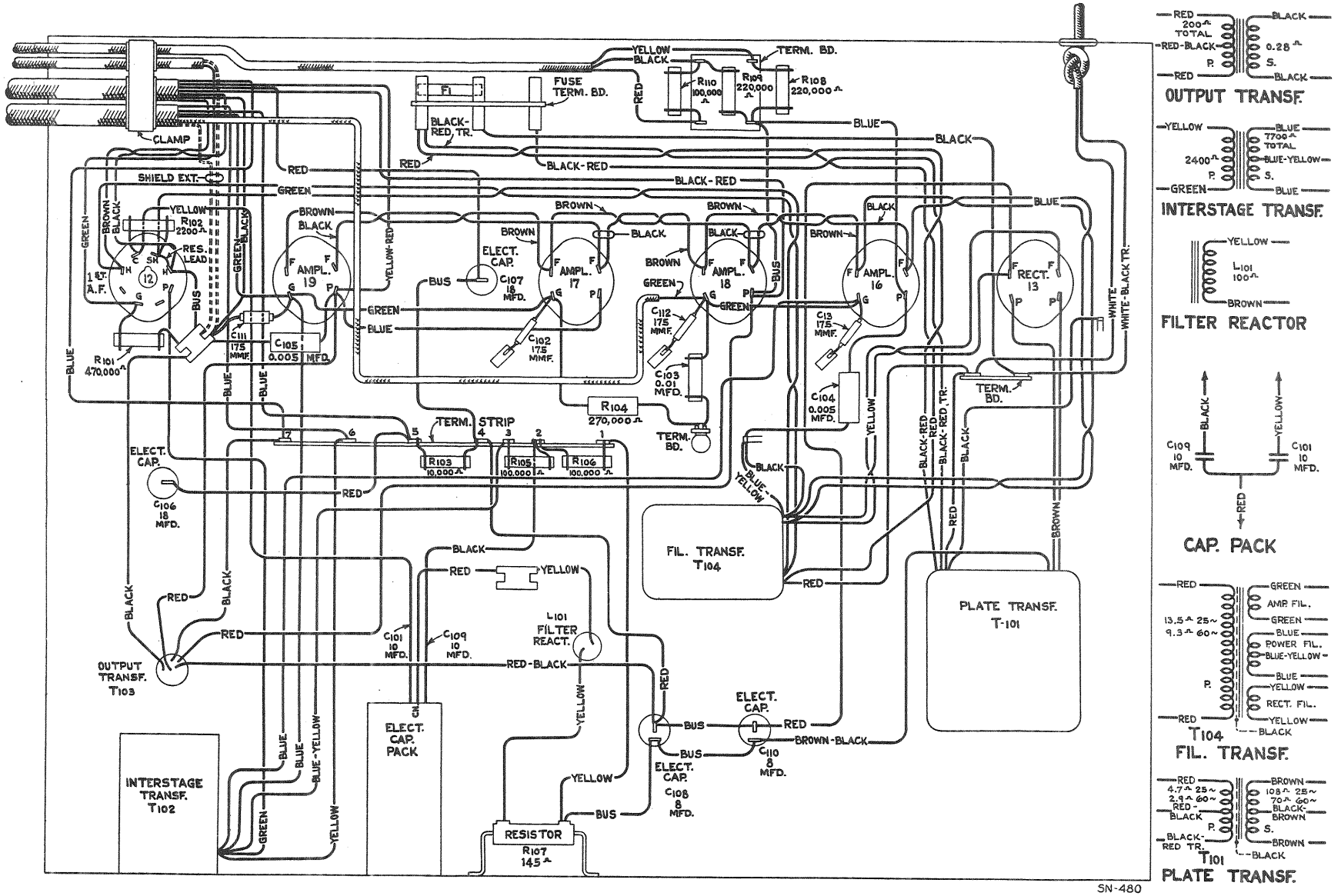


Figure 10—Power Amplifier Wiring

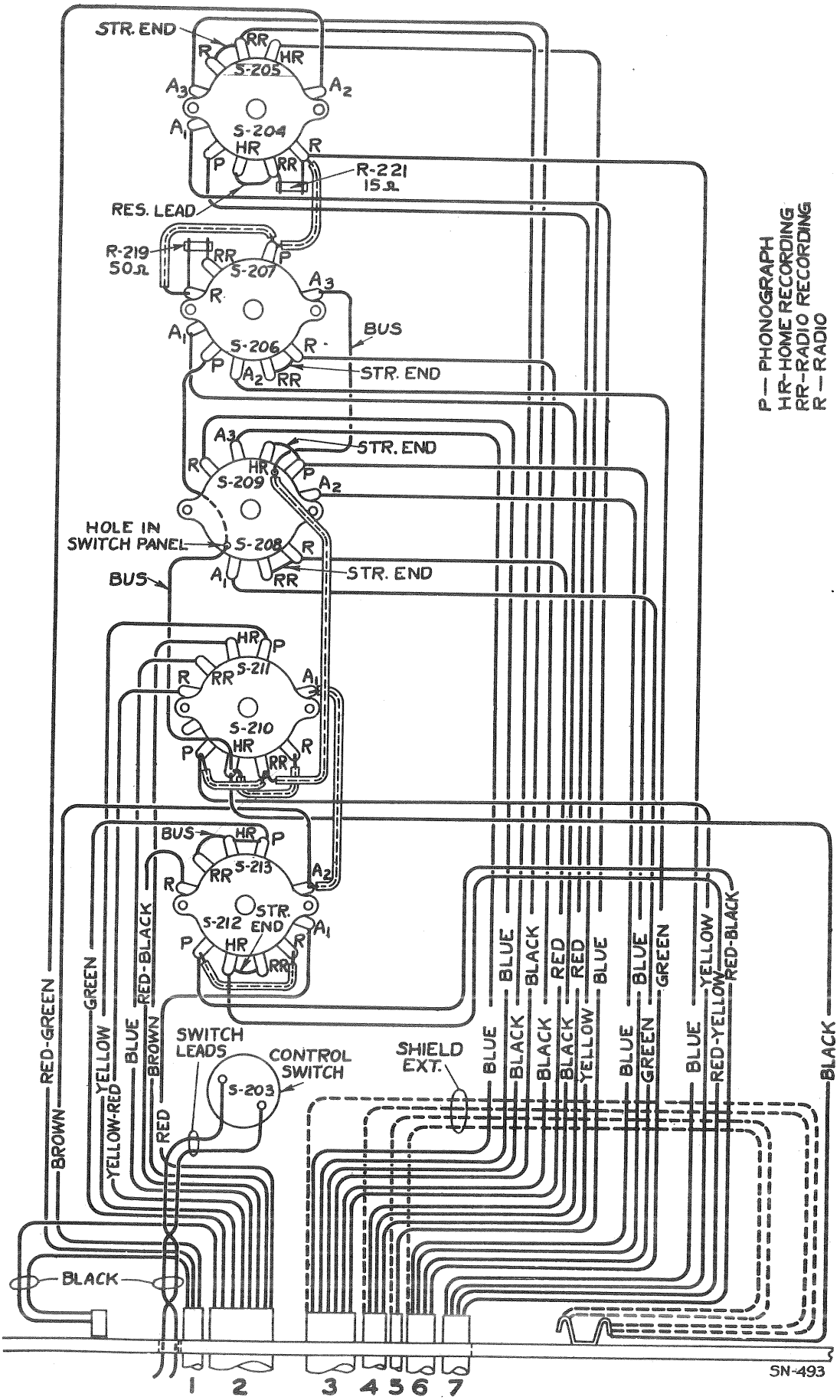


Figure 11—Change-Over Switch Wiring

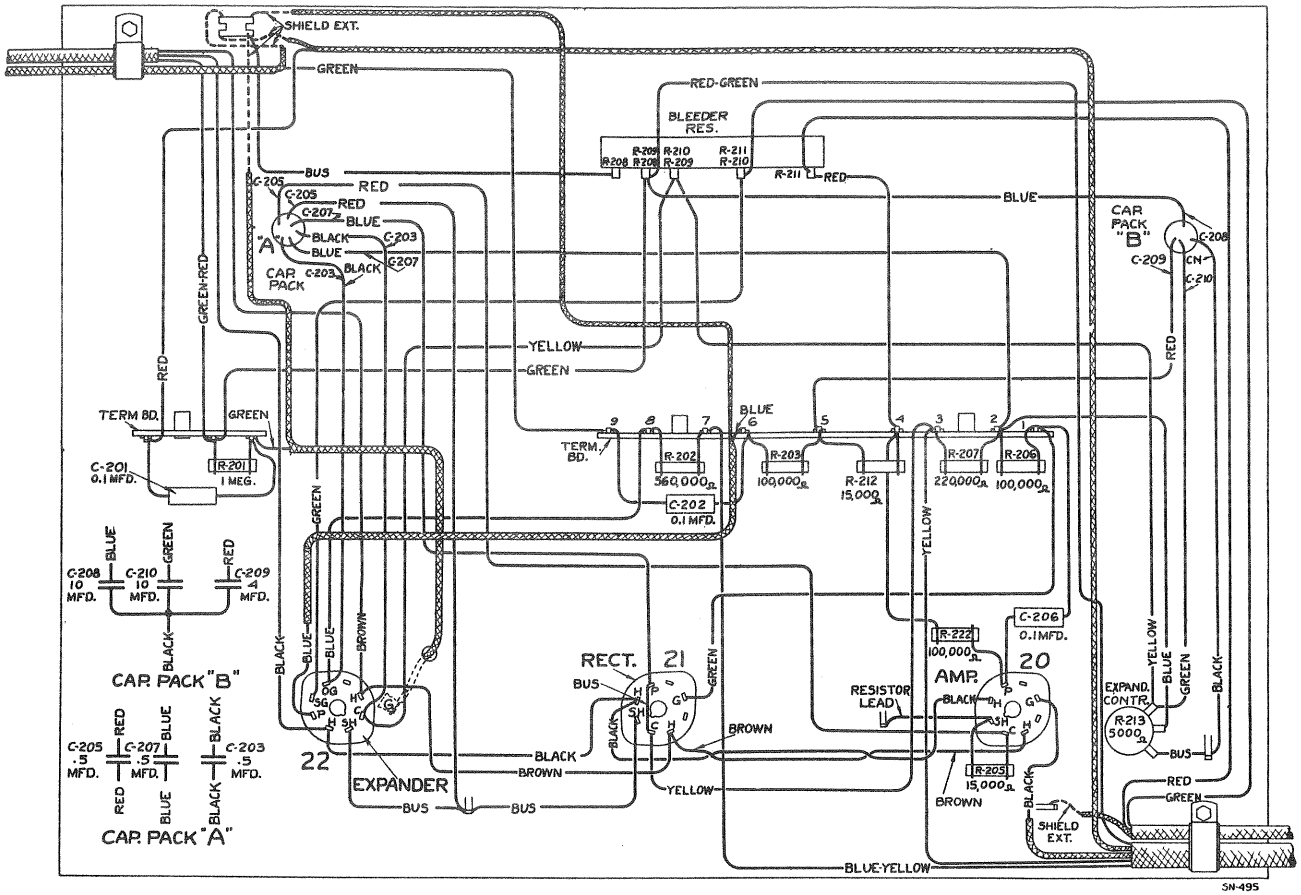


Figure 12—Dynamic Amplifier Wiring

ture. The plate current during the playing of such a record should increase from the static value of 0.10-0.13 ma. to a minimum of 0.55 ma.

Variations of the Radiotron (RCA-6L7) in the audio expander stage may affect operation of the circuit. Several tubes of such type should therefore be tried when correct performance is not obtainable from a single tube. The various voltages of the dynamic amplifier under a no-signal condition are indicated in Figure 4. It is very important that these voltages be as near to the specified values as possible.

If excessive hum is encountered, it is recommended that a different RCA-6L7 be tried in the expander unit. If this does not reduce the hum to a low enough value try reversing the power-line supply cord plug and/or the power amplifier supply plug to obtain a condition of minimum hum. The continuity of ground connections between chassis, expander unit, and power amplifier should be of very low resistance to maintain minimum hum.

Automatic Record Ejector

The record changing mechanism is designed to be simple and fool-proof. Under normal operating conditions, service difficulties should be negligible. Occasionally, however, certain adjustments may be required. These adjustments are illustrated and explained in Figure 15.

It is important when servicing the automatic mechanism, to have it placed on a level support. It is also important to refrain from forcing the mechanism if there is a tendency to bind or jam, since bent levers and possibly broken parts may result.

The tip of the record ejector is adjustable in relation to the turntable spindle, the two being exactly coaxial when properly adjusted. To align the tip, remove the rubber silencer of the ejector assembly, loosen ejector tip retaining nut and slide the tip assembly to the position where it is in true-line with the axis of the turntable spindle. This adjustment may be simplified by placing several records on the turntable, depressing the spindle through the top record hole and lining up the ejector tip in the spindle hole of the record.

To insure that the ejector tip rotates freely, apply a slight amount of oil to the shank of the tip at the point where it is in contact with the ball bearing.

Magnetic Pickup

The pickup used in the phonograph unit is of an improved design, having several variations from the usual type of pickup. The magnetic assembly is one rigid piece. The horseshoe magnet is solidly welded to the pole pieces and is irremovable. There is a centering spring attached to the armature to maintain proper adjustment and provides a damping effect on the move-

ment of the armature. A neutralizing coil is mounted in the magnet assembly in such manner that it balances out hum induced by stray magnetic fields but does not affect the audio signal. The frequency response is uniform over a wide range.

Service operations which may be necessary on the pickup are as follows:—

CENTERING ARMATURE

Refer to Figure 16 showing the pickup inner structure. The armature is shown in its proper relation to the magnet pole pieces, i. e., exactly centered. Whenever this centering adjustment has been disturbed, the screws A, B, and C should be loosened and the armature clamp adjusted to the point where the vertical axis of the armature is at right angles to the horizontal axis of the pole pieces, and centered between them. This centering operation may be facilitated by inserting a small rod or nail into the armature needle hole, using it as a lever to test the angular movement of the armature. The limitations of the movement in each direction will be caused by the armature striking the pole pieces. The proper adjustment is obtained when there is equal angular displacement of the armature and adjustment rod or nail to each side of the vertical axis of the magnet and coil assembly. The screws A and B should then be secured, observing care not to disturb the adjustment of the armature clamp. Then place the pickup in a vise and secure the centering spring-clamp by means of the screw C, allowing the centering spring to remain in the position at which the armature is exactly centered between the pole pieces. With a little practice, the correct adjustment of the armature may be readily obtained. The air gap between the pole pieces and the armature should be kept free from dust, filings, and other such foreign materials which would obstruct the movement of the pickup armature.

DAMPING BLOCK

The viscoloid block which is attached to the back end of the armature shank serves as a mechanical filter to eliminate undesirable resonances and to cause the frequency response to be uniform. Should it be necessary to replace this damping block, it may be done by removing the armature and viscoloid assembly from the mechanism and taking off the old viscoloid block. The

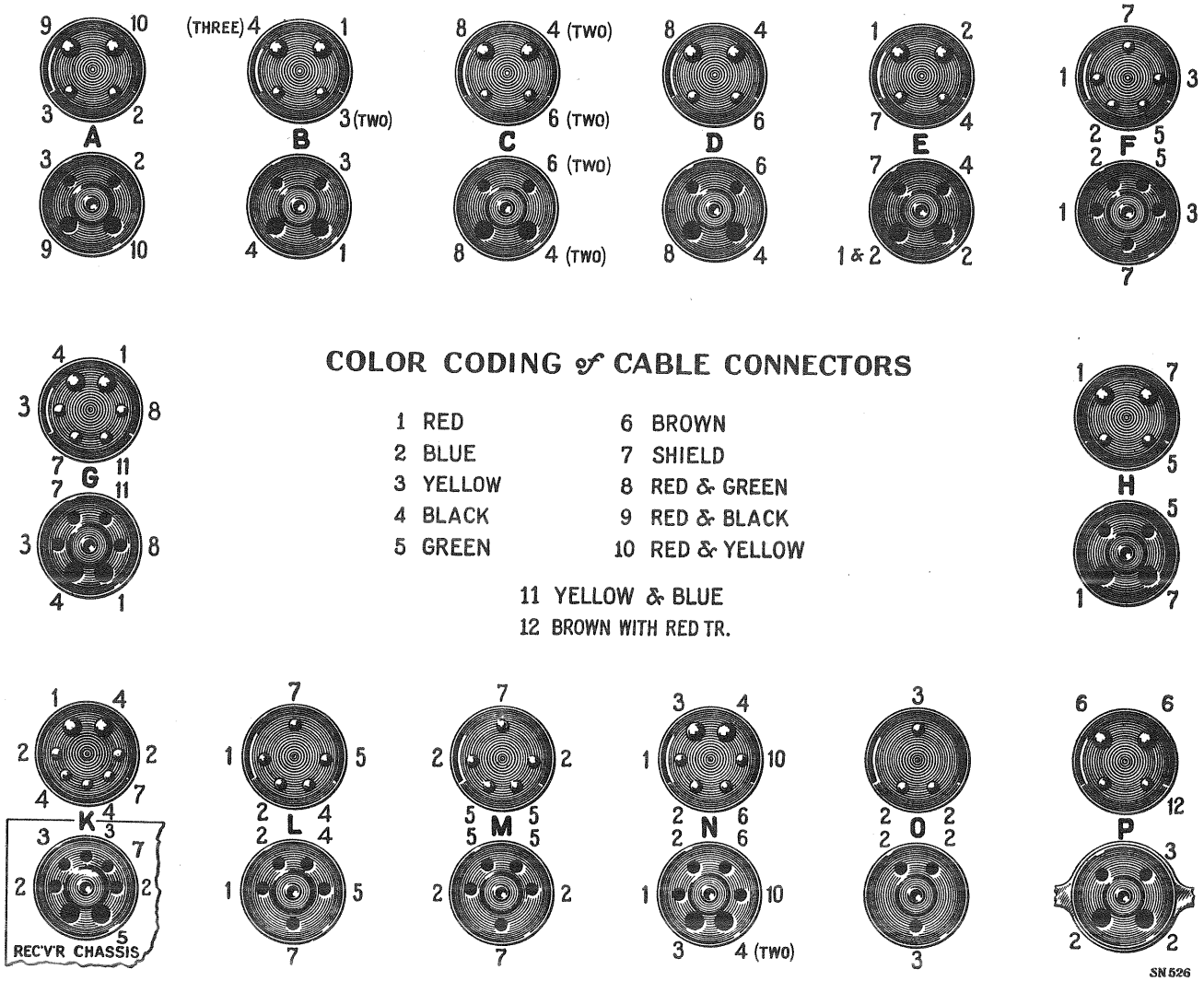


Figure 13—Socket and Plug Details of Assembly Wiring
(Refer to Figure 14)

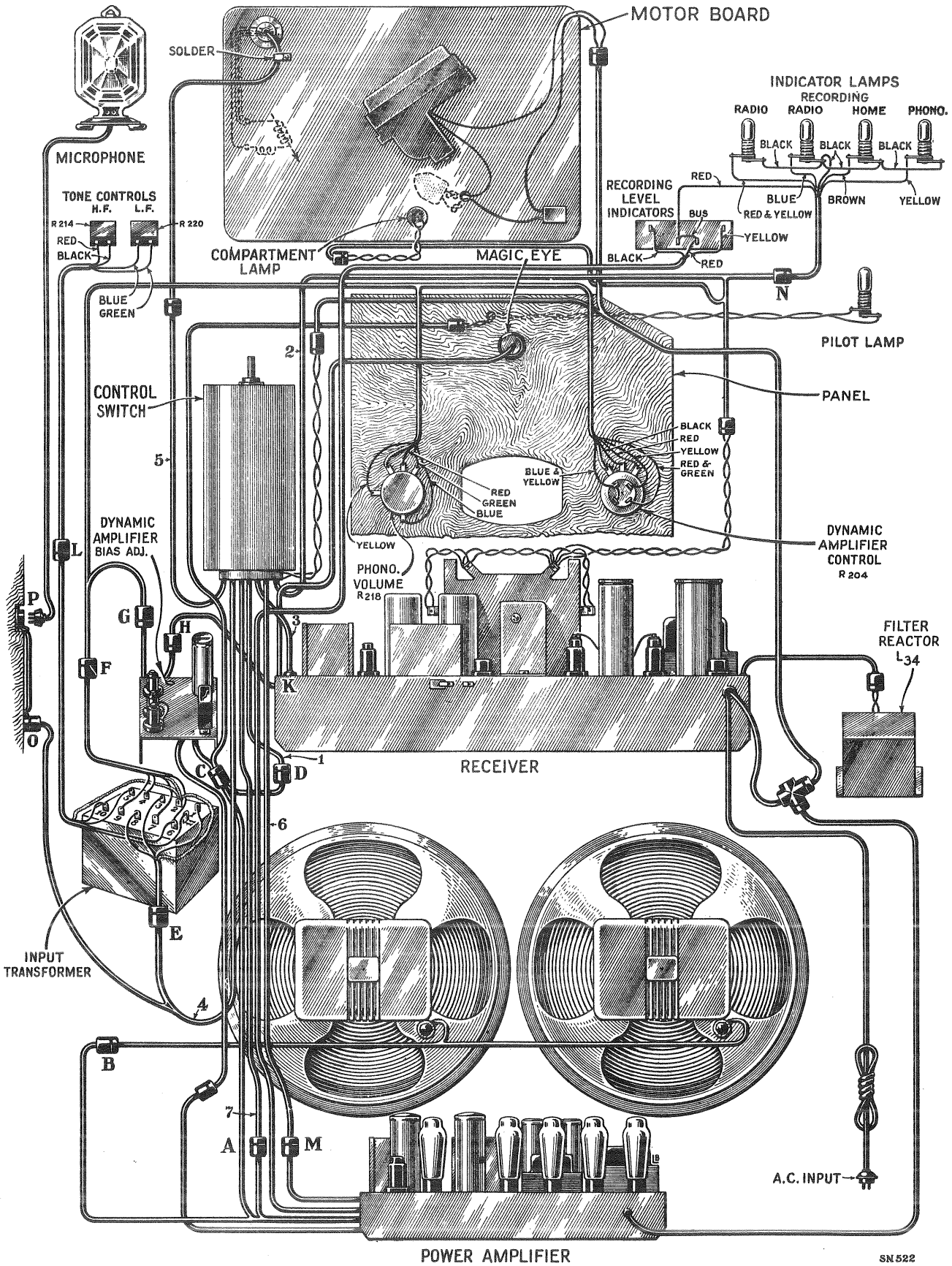


Figure 14—Assembly Wiring

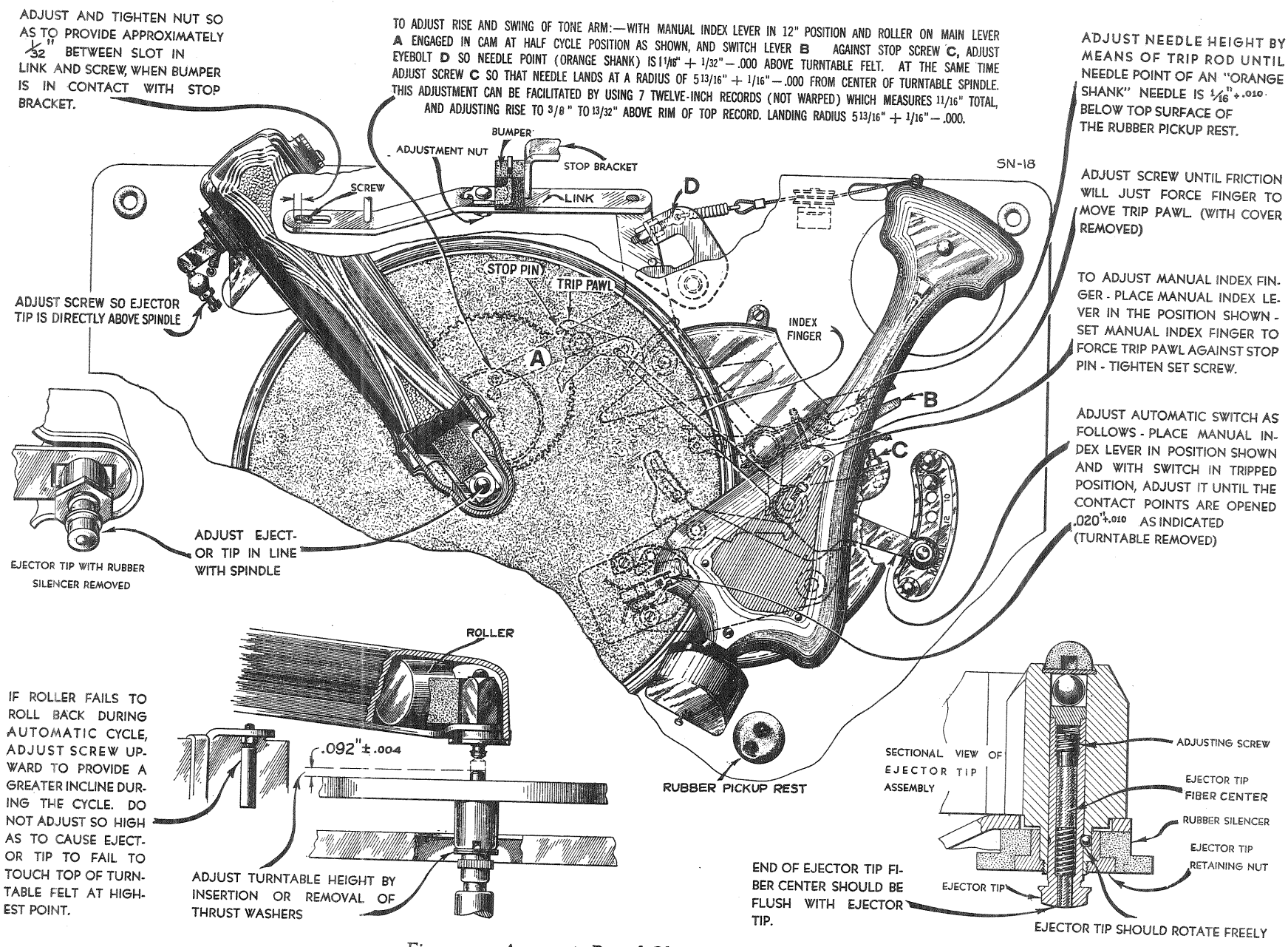


Figure 15—Automatic Record Changer Adjustments

surface of the armature which is in contact with the viscoloid should be thoroughly cleaned with fine emery cloth and then inserted into the new block so that it occupies the same position as it did originally. Make certain that the block is in correct vertical alignment with the armature. The hole in the new viscoloid block

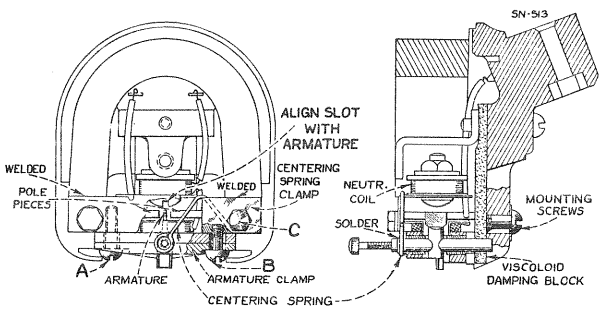


Figure 16—Details of Pickup

is somewhat smaller than the diameter of the armature in order to permit a snug fit. With the viscoloid aligned on the armature, heat should be applied to the armature (viscoloid side) so that the viscoloid block will fuse at the point of contact and become rigidly attached to the armature. A special-tip soldering iron constructed as shown in Figure 17 will be found very useful in performing this operation. The iron should be applied only long enough to slightly melt the block and cause a small bulge on both sides. The pickup should then be carefully re-assembled and the armature centered as previously explained.

Replacing Coils

Whenever there is defective operation due to open or shorted pickup coils, these coils should both be replaced. The method of replacement will be obvious upon inspection of the pickup assembly and by study of the cut-a-way illustrations. It is important to readjust the armature as previously explained after reassembly of the mechanism. It is also necessary to have the hum and signal coils mounted in proper relation to each other in order that there may be the intended neutralization between them. Make certain that the slot in the center screw of the neutralizing coil is aligned directly over the armature tip, as illustrated. Only rosin core solder should be used for soldering the coil leads in the pickup. This same type of solder should be used when necessary for soldering the centering spring to the armature.

Magnetizing

Loss of magnetization will not usually occur when the pickup has received normal care, due to the fact that the magnet and pole pieces are one unit and the magnetic circuit remains closed at all times. When the pickup has been mishandled, subjected to a strong a-c field, jolted, or dropped, there may be an appreciable loss of magnetic strength, in which case it will be necessary to re-magnetize the entire structure. This should

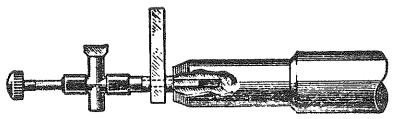


Figure 17—Special Soldering-Iron Tip

be done by placing the pickup assembly on the poles of a standard pickup magnetizer and charging the pickup in accordance with the instructions accompanying the magnetizer. It is preferable to check the polarity of the pickup magnet and to re-magnetize it so that the same polarity is maintained.

REPLACEMENT PARTS

Insist on genuine factory tested parts, which are readily identified and may be purchased from authorized dealers

Stock No.	Description	List Price
	RECEIVER ASSEMBLIES	
5243	Arm—Band indicator operating arm with stud, set screws, nut, and washer	$0.42
4427	Bracket—High frequency tone control, low frequency tone or power switch or volume control mounting bracket	.18
11591	Button—Plug button	.10
11489	Cable—Two conductor cable with three way connector plug—Stock No. 11490	.66
11487	Cable—Two conductor shielded cable with female section of two contact connector plug—Stock No. 11488—To choke—(L34)	.42
11486	Cable—Two conductor shielded voltage supply cable with female section of four contact connector plug—Stock No. 4153—To (1) Terminal board and R19, (1) Terminal board, R3 and S8 shield to S205—Expander unit	1.08
11255	Cable—Four conductor tuning tube cable with connector socket—Stock No. 11381	1.20
5241	Capacitor—Adjustable capacitor—(C23, C27)	.40
5242	Capacitor—High frequency tone capacitor—.005 Mfd.—(C56)	.52
11286	Capacitor—14 MMfd.—(C19)	.24
11292	Capacitor—22 MMfd.—(C11)	.24
11289	Capacitor—50 MMfd.—(C8, C30)	.26
11291	Capacitor—115 MMfd.—(C62, C65)	.24
11295	Capacitor—200 MMfd.—(C55)	.30
11294	Capacitor—325 MMfd.—(C24)	.32
11290	Capacitor—400 MMfd.—(C9, C18, C20, C49, C64)	.25
11299	Capacitor—600 MMfd.—(C48)	.26
3784	Capacitor—900 MMfd.—(C69)	.30
11335	Capacitor—1300 MMfd.—(C22)	.30
11287	Capacitor—4500 MMfd.—(C21, C77)	.30
5005	Capacitor—0.0035 Mfd.—(C57)	.16
4858	Capacitor—0.01 Mfd.—(C17, C68)	.25
4870	Capacitor—.025 Mfd. (C47)	.20
4836	Capacitor—0.05 Mfd.—(C5, C16, C35, C40, C70)	.30
11414	Capacitor—0.1 Mfd.—(C31)	.20
4885	Capacitor—0.1 Mfd.—(C10, C34, C39, C42, C43)	.28
4841	Capacitor—0.1 Mfd.—(C7, C28, C36, C41, C67)	.22
5170	Capacitor—0.25 Mfd.—(C78, C79)	.25
3597	Capacitor—0.25 Mfd.—(C51)	.40
11203	Capacitor—10 Mfd.—(C71)	1.18
5212	Capacitor—18 Mfd.—(C72)	1.16
5213	Capacitor Pack—Comprising one 4. Mfd., one 8. Mfd., and one 10. Mfd. capacitors—(C50, C73, C74)	2.94

Stock No.	Description	List Price
	RECEIVER ASSEMBLIES—Continued	
5236	Capacitor Pack—Comprising two 0.5 Mfd. capacitors, one 680 ohm resistor and one 820 ohm resistor—(C53, C54, R23, R27)	1.36
5215	Coil—Antenna coil for "A" and "C" band—(L1, L2, L5, L6, C1, C3)	2.32
5218	Coil—Antenna coil for "X" and "B" band—(L3, L4, L7, L8, C2, C4)	2.58
5216	Coil—Dectector coil for "A" and "C" band—(L9, L10, L13, L14, C12, C14)	2.34
5219	Coil—Detector coil for "X" and "B" band—(L11, L12, L15, L16, C13, C15)	2.58
5217	Coil—Oscillator coil for "A" and "C" band—(L18, L20, C25, C75)	2.20
5221	Coil—Oscillator coil—"D" band—Located on Range Switch	.64
5220	Coil—Oscillator coil for "X" and "B" band—(L19, L21, L22, C26, C76)	2.24
5214	Condenser—Three gang variable tuning condenser—(C6, C29, C63)	4.42
5222	Control—Tone control—High frequency tone control—(R28)	1.04
5223	Control—Volume control—(R24, R25, R26)	1.22
5240	Cover—Fuse cover	.24
11202	Foot—Chassis mounting (bracket) foot—Package of 2	.78
10907	Fuse—Three ampere fuse—(F1)—Package of 5	.40
5226	Lamp—Dial lamp—Package of 5	.70
5239	Mounting—Fuse mounting	.36
4153	Plug—Female section four-contact connector plug—used on cables—Stock Nos. 11486, 11503, 11569	.48
11490	Plug—Three-way plug for cable—Stock No. 11489	.26
5233	Reactor—Coupling reactor—(L29)	2.32
11488	Receptacle—Two-contact female section of connector—used with cables.—Stock Nos. 11487, 11502, 11513, 11567, 11571	.14
11718	Resistor—Wire wound resistor—800-8500 Ohms—(R44, R45)	1.08
11296	Resistor—330 Ohms—Carbon type—¼ watt—(R2, R12)—Package of 5	1.00
11285	Resistor—1000 ohms—Flexible type resistor—(R13, R17, R36)—Package of 5	1.00
5112	Resistor—1000 ohms—Carbon type—¼ watt—(R4, R10, R15, R29)—Package of 5	1.00
11283	Resistor—1200 Ohms—Carbon type—¼ watt—(R3, R31)—Package of 5	1.00
4408	Resistor—1500 Ohms—Carbon type—¼ watt—(R8)—Package of 10	2.00
5159	Resistor—2200 Ohms—Carbon type—¼ watt—(R35)—Package of 5	1.00
11298	Resistor—5600 Ohms—Carbon type—1 watt—(R21)	.22
8043	Resistor—10,000 Ohms—Carbon type—2 watts—(R22)	.25
5114	Resistor—15,000 Ohms—Carbon type—1 watt—(R5)	.22
11400	Resistor—27,000 Ohms—Carbon type—¼ watt—(R30)—Package of 5	1.00
8065	Resistor—27,000 Ohms—Carbon type—½ watt—(R33)—Package of 5	1.00
11300	Resistor—33,000 Ohms—Carbon type—⅒ watt—(R32)—Package of 5	.75
11282	Resistor—56,000 Ohms—Carbon type—⅒ watt—(R9)—Package of 5	.75
8064	Resistor—82,000 Ohms—Carbon type—½ watt—(R43)—Package of 5	1.00
3118	Resistor—100,000 Ohms—Carbon type—¼ watt—(R16)—Package of 5	1.00
5027	Resistor—150,000 Ohms—Carbon type—¼ watt—(R37)—Package of 5	1.00
5108	Resistor—330,000 Ohms—Carbon type—¼ watt—(R11, R14, R38)—Package of 5	1.00
11297	Resistor—330,000 Ohms—Carbon type—⅒ watt—(R1, R6)—Package of 5	.75
3033	Resistor—1 Megohm—Carbon type—¼ watt—(R7)—Package of 5	1.00
11382	Resistor—1 Megohm—Carbon type—⅒ watt—(R39)—Located in tuning tube cable—Package of 5	.75
11626	Resistor—2.2 Megohm—Carbon type—¼ watt—(R20)—Package of 5	1.00
4669	Screw—No. 8—32—$\frac{5}{32}$" Set screw for indicator operating arm—Package of 10	.25
5249	Shield—Metal shield case for antenna, detector, or oscillator coils	.20
11273	Shield—Radiotron shield	.25
11381	Socket—Tuning tube cable connector socket	.45
11598	Socket—Dial lamp socket	.14
4794	Socket—Four-contact socket for 5Z3 Radiotron—(No. 14)	.15
11197	Socket—Six-contact socket for 6C5 Radiotrons—(Nos. 9, 10, 11)	.14
11278	Socket—Seven-contact socket for 6J7 Radiotron—(No. 3)	.20
4787	Socket—Seven-contact socket for Cable Stock—(No. 11568)	.15
11198	Socket—Seven-contact socket for 6K7, 6H6, Radiotrons—(Nos. 2, 4, 5, 6 and 8)	.15
11280	Socket—Seven-contact socket for 6L7 Radiotron—(No. 2)	.14
5225	Switch—Range switch—(S1, S2, S3, S4, S5, S6, S7, S8, S9, S10, S11)	3.75
11507	Switch—Low frequency tone or power switch—(S13, S14)	.92
11508	Transformer—Driver transformer—T3	2.75
5234	Transformer—Interstage transformer—T2	3.40
5228	Transformer—First intermediate frequency transformer—(L23, L24, C32, C33)	1.80
5229	Transformer—Second intermediate frequency transformer—(L25, L26, C37, C38, C66, R34)	2.42
5230	Transformer—Third intermediate frequency transformer—(L27, L28, C44, C45, C46, R18, R19)	2.76
5231	Transformer—Fourth intermediate frequency transformer—(L31, L32)	1.50
8062	Transformer—Power transformer—105-125 volts—25-50 cycles	9.84
8061	Transformer—Power transformer—105-125 volts—50-60 cycles—(T1)	6.75
	CONDENSER DRIVE ASSEMBLIES	
5243	Arm—Band indicator operating arm	.42
10194	Ball—Steel ball for drive assembly—Package of 20	.25
8054	Cam—Five-position cam for station selector drive assembly	.28
4422	Clutch—Tuning condenser drive clutch assembly—comprising shaft, balls, ring, spring and washers assembled	1.00
8048	Coupling—Flexible coupling for variable capacitor—includes indicator shaft	.70
11336	Dial—Dial scale with mounting rivets	.60
8045	Disc—Drive disc and Micarta gear assembly	.46
11380	Drive—Tuning condenser drive assembly—complete	6.35
8044	Escutcheon—Dial escutcheon with vernier scale	1.08
8046	Gear—Indicator shaft, Micarta drive gear and Brass vernier idler with one spring	.72
8050	Gear—Gear sector and band indicator operating link—(link connects to arm on band switch)	.15
8053	Indicator—Station selector vernier indicator pointer	.12
11793	Indicator—Station selector indicator pointer.	.15
8051	Link—Complete—with roller and spring	.30
8049	Pinion—Vernier pointer drive pinion and shaft	.55
4669	Screw—No. 8—32—$\frac{5}{32}$" Square head set screw—Package of 10	.25
8047	Spring—Coil spring for indicator shaft drive gear and vernier idler—(Stock No. 8046)	.12
8052	Spring—Coil spring for link—Package of 5	.32
8042	Stud—Band indicator operating arm stud—Package of 5	.25

Stock No.	Description	List Price
	AMPLIFIER ASSEMBLIES	
11502	Cable—Single conductor shielded cable with female section of connector—Stock No. 11488)—Connects to Grid of first audio socket in amplifier—to expander unit—(C202)	.74
11501	Cable—Three conductor cable—Connects from R108, R109 and R110 in amplifier—to Neon indicator lamp	.64
11504	Cable—Four conductor shielded cable with five contact female connector plug—Stock No. 11506—connects to Amplifier "G," sockets No. 18 and No. 19—(T102, C106)—Terminals	.20
11503	Cable—Eight conductor cable with four female sections of connectors—(Stock No. 4153) — From (C107)—Amplifier Plate—(C111)—and "H" of first "AF" in Amplifier—to expander, control switch and reproducers	3.70
11500	Capacitor—175 MMfd.—(C102, C111, C112, C113)	.18
4838	Capacitor—0.005 Mfd.—(C104, C105)	.20
4858	Capacitor—0.01 Mfd.—(C103)	.25
11497	Capacitor—8 Mfd.—(C108, C110)	1.04
11496	Capacitor—18 Mfd.—(C106, C107)	1.15
11498	Capacitor Pack—Comprising two 10 Mfd. capacitors—(C101, C109)	1.00
4358	Clamp—Capacitor clamp for capacitor—(Stock No. 11498)	.15
11488	Connector—Female section—two contact connector—used on cables—(Stock Nos. 11502, 11513, 11487, 11567 and 11571)	.14
4153	Connector—Female section—four contact connector—used on cables—Stock Nos. 11503, 11486, 11569	.48
5240	Cover—Fuse cover	.24
10907	Fuse—Three ampere fuse—Package of 5—(F1)	.40
5239	Mounting—Fuse mounting	.36
11493	Reactor—Power filter reactor—(L101)	3.70
11506	Receptacle—Female section—five prong plug—used on cable—Stock Nos. 11504, 11517, 11518	.65
11499	Resistor—Wire wound—145 ohms—(R107)	.74
5159	Resistor—2200 Ohms—Carbon type—¼ watt—Package of 5—(R102)	1.00
3078	Resistor—10,000 Ohms—Carbon type—½ watt—(R103)—Package of 5	1.00
3118	Resistor—100,000 Ohms—Carbon type—¼ watt—(R106, R105, R110)—Package of 5	1.00
5158	Resistor—220,000 Ohms—Carbon type—¼ watt—(R108, R109)—Package of 5	1.00
11323	Resistor—270,000 Ohms—Carbon type—¼ watt—(R104)—Package of 5	1.00
11172	Resistor—470,000 Ohms—Carbon type—¼ watt—(R101)—Package of 5	1.00
4794	Socket—Four contact socket—for 2A3 and 5Z3 Radiotrons	.15
11198	Socket—Seven contact socket—for 6C5 Radiotron	.15
11492	Transformer—Filament transformer—105-125 volts—50-60 cycle—(T104)	6.10
11879	Transformer—Filament transformer—105-125 volts—25-50 cycle—(T104)	3.50
11878	Transformer—Plate transformer — 105-125 volts—25-50 cycle—(T101)	5.55
11495	Transformer—Interstage transformer—(T102)	3.16
11494	Transformer—Output transformer—(T103)	5.65
11491	Transformer—Plate transformer — 105-125 volts—50-60 cycle—(T101)	6.00
	DYNAMIC (EXPANDER) AMPLIFIER ASSEMBLIES	
11514	Cable—Single conductor shielded cable—with male section of two-prong plug—Stock No. 4674—From (C202) and ground terminal	1.00
11516	Cable—Two conductor shielded cable—with male section of four-prong plug—Stock No. 6123—To (R211) and capacitor pack—(C208, C209 and C210)	.68
11513	Cable—Three conductor cable—with one male section of connector and one female section of connector—Stock Nos. 6123, 11488—To (R208) and "H-H"—Socket No. 22	1.06
11515	Cable—Five conductor shielded cable—with male section six-prong connector—Stock No. 4574—To (R202), (R207), "G Amplifier 20," (C201), (R206) and ground terminal	1.50
11350	Cap—Grid control contact cap—Package of 5	.20
11414	Capacitor—0.1 Mfd.—(C202, C206)	.20
4841	Capacitor—0.1 Mfd.—(C201)	.22
11509	Capacitor Pack—Comprising three 0.5 Mfd. capacitors—(C203, C205, C207)	1.75
11608	Capacitor Pack—Comprising two 10 Mfd. and one 4 Mfd. capacitors—(C208, C209, C210)	1.98
4358	Clamp—Capacitor clamp	.15
11488	Connector—Two contact female section of connectors—used with cables—Stock Nos. 11513, 11502, 11567, 11487, 11571	.14
11512	Control—Expander bias control—(R213)	.78
11511	Foot—Chassis mounting (bracket) foot	.50
4674	Plug—Male section two prong connector—used with cables—Stock Nos. 11514, 11524	.25
6123	Plug—Male section four prong plug—used with cables—Stock Nos. 11513, 11516, 11526, 11525, 11572	.30
4574	Plug—Six prong male section of connector plug—used with cables—Stock Nos. 11515, 11522	.48
5158	Resistor—220,000 Ohms—Carbon type—¼ watt—(R207)—Package of 5	1.00
3998	Resistor—15,000 Ohms—Carbon type—¼ watt—(R205, R212)—Package of 5	1.00
3118	Resistor—100,000 Ohms—¼ watt—Carbon type—(R203, R206)—Package of 5	1.00
3252	Resistor—100,000 Ohms—Carbon type—½ watt—(R213)—Package of 5	1.00
5035	Resistor—560,000 Ohms—Carbon type—¼ watt—(R202)—Package of 5	1.00
3033	Resistor—1 Megohm—Carbon type—¼ watt—(R201)—Package of 5	1.00
11510	Resistor—Wire wound—425, 365, 3200 and 3900 Ohms—(R208, R209, R210, R211)	.74
11197	Socket—Six-contact socket for 6C5 Radiotron	.14
11198	Socket—Seven-contact socket for 6L7 Radiotron	.15
	MISCELLANEOUS CABLE AND PLUGS	
11524	Cable—Two-conductor cable with two-prong male section of connector plug—Stock No. 4674—From pilot lamp to cable—Stock 11567	.36
11526	Cable—Three-conductor shielded cable with four-prong male section of connector plug Stock No. 6123 and three terminals—connects from input transformer terminals Nos. 1, 3 and 8 to cable—Stock No. 11527	1.02
11527	Cable—Three-conductor cable with one four-contact microphone socket and one three-prong male section of connector plugs—Stock Nos. 4592, 5118	.50
11523	Cable—Three-conductor cable with two female two-contact and one male section of connector plugs—Stock Nos. 2308, 4573—From power cable, Stock No. 11489 to motor leads, and leads from control switch S203	2.22
11517	Cable—Four-conductor shielded cable with female section of connector plug—Stock No. 11506—Connects from tone controls, R214 and R220, to input transformer cable—Stock No. 11521	2.15
11518	Cable—Four-conductor shielded cable with female section of connector plug—Stock No. 11506—From input transformer terminals, Nos. 2, 5, 6 and 10, to cable—Stock No. 11519	1.92
11521	Cable—Four-conductor shielded cable with five-prong male section of connector—Stock No. 11520—From input transformer terminals Nos. 4, 5, 7 and 9 to cable—Stock No. 11517	1.12

Stock No.	Description	List Price
	MISCELLANEOUS CABLE AND PLUGS—Continued	
11522	Cable—Six-conductor cable, with Connector Stock No. 4574, from Radio-Phonograph, Home and Radio Recording indicator lamps, to cable—Stock No. 11567 from control switch	1.18
11525	Cable—Seven-conductor cable with one four-contact male and two four-contact female sections of connectors—Stock Nos. 5040, 6123—connects from Reproducers to cable—Stock No. 11503 amplifier	1.98
11519	Cable—Nine-conductor shielded cable with one six-contact female and one five-prong male section of connector plugs—Stock Nos. 4151, 11520—From expander control (R204) and phonograph volume control (R218) to expander and input transformer cable—Stock No. 11518	4.50
4577	Plug—Two-prong male section of motor connection plug—Connects to cable—Stock No. 11523	.30
4674	Plug—Two-contact male section of connector plug for cable—Stock Nos. 11524, 11514	.25
2308	Plug—Two-contact male section of connector plug for cable—Stock No. 11523	.55
5118	Plug—Three-prong male section of connector plug for cable—Stock No. 11527	.25
6123	Plug—Four-prong male section of connector for cable—Stock No. 11525 and Stock Nos. 11526, 11516, 11513, 11572	.30
11520	Plug—Five-prong male section of connector plug for cable—Stock No. 11519 and Stock Nos. 11521, 11630	.34
4574	Plug—Six-contact male section of connector for cable—Stock Nos. 11522, 11515	.48
4573	Receptacle—Two-contact female section of connector plug for cable—Stock No. 11523	.30
5040	Receptacle—Four-contact female section of connector for cable—Stock No. 11525	.25
11506	Receptacle—Five-contact female section of connector for cable—Stock No. 11517 and Stock Nos. 11518, 11504	.65
4151	Receptacle—Six-contact female section of connector for cable—Stock Nos. 11519, 11567	.60
4593	Socket—Four-contact microphone socket for cable—Stock No. 11527	.42
	EJECT ARM ASSEMBLIES	
11541	Arm—Eject arm—complete	8.15
11533	Ball—$\frac{1}{16}$" diameter steel ball—Package of 10	.20
10129	Ball—$\frac{3}{16}$" diameter steel ball—Package of 20	.25
11529	Bearing—Ejector tip bearing and nut	.32
11538	Bracket—Eject arm bracket	1.72
11537	Collar—Eject arm shaft collar and set screw	.24
11540	Cover—Eject arm cover	1.52
11536	Cushion—Counter balance roller cushion—Located inside of eject arm	.14
4055	Post—Vertical adjustment post—Located on eject arm bracket	.30
3729	Roller—Eject arm counter balance roller—Located inside of eject arm	.45
4580	Screw—No. 6—32—$\frac{3}{16}$" Square head set screw for eject arm collar—Package of 10	.25
11534	Screw—No. 8—36—$\frac{7}{32}$" Special screw for eject arm tip center adjustment—Package of 10	.14
11535	Shaft and Collar—Eject arm vertical action shaft and collar assembly	.15
11528	Silencer—Ejector tip silencer	.14
4067	Spring—Eject arm bracket spring—Package of 10	.30
11531	Spring—Ejector tip spring—Package of 10	.42
11530	Tip—Ejector tip with tip center, adjusting screw and cap	.32
11539	Yoke—Eject arm yoke assembly	.94
	PICKUP AND ARM ASSEMBLIES	
11482	Arm—Pickup arm complete—less pickup mounting screw, escutcheon and pickup unit	4.80
11543	Armature—Pickup armature	.72
11548	Back—Pickup back	.52
4064	Cable—Pickup arm operating cable—Package of 5	1.00
11544	Coil—Pickup coil—(L305)	.80
11532	Coil—Pickup hum bucking coil—(L306)	.60
4674	Connector—Two-prong male section of pickup cable connector plug—Stock Nos. 11514, 11524	.25
11545	Cover—Pickup front cover	.22
11546	Cover—Pickup back cover with mounting screws	.14
3737	Damper—Pickup damper—Package of 5	.65
11723	Escutcheon—Pickup arm escutcheon	.62
11481	Pickup—Pickup unit complete	4.80
11549	Screw—Pickup front cover screw—Package of 10	.42
3387	Screw, nut and washer for mounting pickup to arm—Package of 10	.40
11547	Screw—Pickup needle screw—Package of 10	.42
11550	Weight—Home recording weight	1.50
	MOTOR BOARD ASSEMBLIES	
11553	Escutcheon—Index escutcheon engraved Manual—12-10	.44
3764	Nut—Cap nut for motor board suspension assembly—Package of 4	.40
3672	Pin—Manual index pin	.42
11551	Rest—Pickup rest	.14
3654	Roller—Pickup arm cable guide roller—comprising bracket roller and guide pin	.34
3763	Suspension Spring—Suspension spring, washer and bolt assembly for motor board—comprising one bolt, two cup washers, two springs, two "C" washers and one cap nut	.42
4671	Switch—Operating switch—toggle type—(S201)	.72
11542	Cover—Turntable cover	.88
11599	Turntable—complete	2.90
	MOTOR ASSEMBLIES	
8055	Gear—Pinion gear for motor spindle	.30
9479	Motor—105-125 volts—25 cycles—(M1)	36.48
9478	Motor—105-125 volts—50 cycles—(M1)	25.88
9477	Motor—105-125 volts—60 cycles—(M1)	25.88
4562	Suspension Spring—Motor mounting spring, washer, and stud assembly—comprising six springs, six cup washers, three spring washers and three studs	.58
11995	Washer—Turntable spindle shim washer assembly—comprising one thin and one thick washer—Package of 3	.15
	AUTOMATIC SWITCH ASSEMBLIES	
3994	Cover—Motor switch cover	.26
10184	Plate—Automatic brake latch plate—Package of 5	.40
10174	Springs—Automatic brake springs—Package of 2	.50
6805	Switch Assembly—Automatic switch complete	1.90
3322	Switch—Motor switch—(S202)	.75
	OPERATING MECHANISM	
6502	Cam—Cam and gear assembly	1.18
6808	Clutch—Trip lever friction clutch	.30
11558	Cover—Metal cover for trip lever and friction finger assembly	.36
6809	Finger—Manual index lever finger assembly	.25
3670	Finger—Friction finger assembly	.32
11554	Lever—Manual index lever—less pin	.62
11556	Lever—Main lever and link assembly	2.10
11557	Lever—Main spring lever	.42
3677	Lever—Pickup arm cable lever assembly—comprising lever with cable screw, spring and nut	.40
11555	Lever—Trip lever and friction clutch assembly	.94
6503	Pawl—Trip pawl assembly	.40
4124	Plate—Eject arm actuating plate assembly	.50
4563	Screw—Cable lever screw and nut—Package of 10	.60

REPLACEMENT PARTS—Continued

Stock No.	Description	List Price
	OPERATING MECHANISM—Continued	
4564	Screw—Manual index lever finger set screw—Package of 10	.20
4059	Screw—Trip lever clutch tension adjustment screw—Package of 10	.22
4566	Screw—Special screw used to fasten main lever and link assembly bushing—Package of 10	.30
11559	Spacer—Pickup arm mounting spacer	.28
4127	Spring—Actuating spring—Package of 10	.24
3666	Spring—Cable lever tension spring—Package of 10	.44
4565	Spring—Manual index lever finger tension spring—Package of 10	.30
4061	Spring—Main spring lever, tension spring—Package of 10	.38
2893	Spring—Trip lever latch plate tension spring—Package of 10	.30
2917	Washer—Spring washer "U" type—Package of 10	.25
	MICROPHONE ASSEMBLIES	
7534	Cable—Microphone cable	.70
11561	Cover—Microphone cover—Package of 2	.32
11560	Frame—Microphone frame	1.00
7533	Mechanism—Microphone mechanism	6.80
11480	Microphone—Complete—(M2)	7.50
11562	Plug—Microphone plug	.25
4158	Socket—Microphone socket	.40
	RECORDING SWITCH ASSEMBLIES	
11571	Cable—Single conductor shielded cable with one female section of connector—Stock No. 11488—To S204, shield grounded to terminal lug—To cable from pickup arm assembly—Stock No. 11482	.64
11566	Cable—Three-conductor cable with male section of four-prong plug—Stock No. 11570—To S213, S205 and terminal lug—and cable—Stock No. 11503	.72
11572	Cable—Four-conductor cable with male section of four-prong plug—Stock No. 6123—To (1) S204, (1) S210, (2) S212 and cable—Stock No. 11503	.88
11569	Cable—Four-conductor shielded cable with one female section of four-contact plug—Stock No. 4153—and one female section of three-contact plug—Stock No. 5119—To (1) S204, (1) S205, (1) S206, (2) three-contact receptacle, shield grounded to terminal lug—and cable—Stock Nos. 11526 and 11527	2.45
11630	Cable—Four-conductor shielded cable with one five-prong male section of plug—Stock No. 11520—To (1) S206, (1) S208, (2) S209—shield grounded to terminal and cable—Stock No. 11504	1.18
11568	Cable—Six-conductor shielded cable—with male section of seven-prong connector plug—Stock No. 4602—To (2) S205, (1) S206, (1) S208, (2) S209 and shield grounded to terminal—Receptacle—Stock No. 4787 on receiver chassis	1.40
11567	Cable—Ten-conductor cable with two-contact female section of plug—Stock No. 11488—and one female section of six-contact plug—Stock No. 4151—To (1) S212, (2) S213, (4) S211 and (1) to terminal lug and cable—Stock No. 11522	.26
11347	Knob—Control switch knob—Package of 5	.75
4577	Plug—Two-prong male section of connector plug—Part of connector cord from S203	.30
6123	Plug—Four-contact male section of connector plug—used with cables—Stock Nos. 11572, 11516, 11513, 11526, 11525	.30
11570	Plug—Male section of four-prong connector plug for cable—Stock No. 11566	.32
11520	Plug—Five-prong male section of connector plug for cable—Stock Nos. 11519, 11521, 11630	.34
4602	Plug—Seven-prong male section of connector plug—used with cable—Stock No. 11568	.56
11488	Receptacle—Two-contact female section of connector plug—used with cables—Stock Nos. 11567, 11571, 11487, 11502, 11513	.14
5119	Receptacle—Female section—three-contact plug receptacle for cable—Stock No. 11569	.25
4153	Receptacle—Female section—four-contact plug receptacle for cable—Stock No. 11569	.48
4151	Receptacle—Six-contact female section of connector plug used with cables—Stock Nos. 11519, 11567	.60
11564	Resistor—47 Ohms—Carbon type—1/10 watt—Package of 5—(R219)	.75
11565	Resistor—15 Ohms—Carbon type—1/4 watt—(R221)—Package of 5	1.00
11563	Switch—Phonograph, Radio, Home Recording and Phonograph recording switch—complete—(S203, S204, S205, S206, S207, S208, S209, S210, S211, S212, S213)	4.80
	INDICATOR ASSEMBLIES	
11522	Cable—Six-conductor indicator assembly cable with male section of six-prong connector plug—Stock No. 4574	1.18
4340	Lamp—Indicator lamp—Package of 5	.60
4574	Plug—Six-prong male section of connector plug—for use with cables—Stock Nos. 11515, 11522	.48
11719	Screen—Indicator lamp screen—Package of 5	.34
11573	Socket—Indicator lamp socket	.28
	RECORDING INDICATOR ASSEMBLIES	
11574	Escutcheon—Recording indicator escutcheon	.32
4161	Lamp—Neon lamp	.56
4164	Screen—Indicator lamp screen	.18
11575	Screw—Screen escutcheon and terminal board mounting screw assembly—comprising two screws, two spacers, two nuts and two lockwashers	.12
	REPRODUCER ASSEMBLIES	
11577	Coil—Field coil magnet and cone support—(L102, L103)	12.00
8056	Cone—Reproducer cone—(L104, L105)	1.58 6.85
5039	Plug—Male section of four-prong plug	.25
9629	Reproducer—Complete	14.55
	MISCELLANEOUS ASSEMBLIES	
11881	Base—Phonograph compartment lamp base	.55
4391	Box—Needle box	.70
11606	Cap—Pilot lamp cap—Package of 5	.22
11997	Capacitor—75 MMfd.—(C216)	.14
11884	Control—Expander control—(R204)	1.16
11580	Cover—Pilot lamp cover	.12
11379	Escutcheon—Station selector escutcheon and crystal	1.08
11347	Knob—Phonograph or Radio high or low frequency tone control, Radio volume control, Range switch, Selector switch knob—Package of 5	.75
11582	Knob—Expander control or Phonograph volume control knob—Package of 5	.50
11346	Knob—Station selector knob—Package of 5	.75
11605	Pad—Home recording pad	.45
11578	Reactor—Filter reactor—(L34)	3.70
11607	Receptacle—Receptacle for new needles	.38
11711	Shade—Phonograph compartment lamp shade	.16
11579	Tone Control—Phonograph low frequency tone control	.98
11581	Tone Control—Phonograph high frequency tone control	.98
11883	Transformer—Microphone and pickup input transformer pack—(R215, R216, R217, C204, C211, C212, C213, C214, C215, L301, L302, T201)	10.45
11877	Volume Control—Phonograph volume control—(R28)	1.42