



RCA Victor

MODEL QU8

Twenty-Four Tube, Eight-Band, AC Superheterodyne Receiver,
Automatic Phonograph, Recorder, and Public Address System
TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL

Electrical and Mechanical Specifications

FREQUENCY RANGES

Long Wave ("X" Band)..... 140-410 kc (2145-735 m)
Medium Wave ("A" Band)..... 540-1,720 kc (555-174 m)
Short Wave ("B" Band)..... 3.1-9.5 mc (97.5-31.5 m)
31 Meter Spread Band..... 9.45-12 mc (31.8-25.4 m)
25 Meter Spread Band..... 11.65-15.2 mc (25.6-19.9 m)
19 Meter Spread Band..... 15.1-17.75 mc (19.9-16.9 m)
16 Meter Spread Band..... 17.73-18.5 mc (16.9-16.2 m)
13 Meter Spread Band..... 21.45-22.6 mc (13.95-13.3)

INTERMEDIATE FREQUENCY 455 kc

POWER OUTPUT RATING

Undistorted..... 50 watts
Maximum..... 60 watts

LOUDSPEAKERS (2)

Type..... 12 in. Electrodynamical
Voice Coil Impedance..... 11.5 ohms at 400 cycles

PHONOGRAPH

Type..... Fully Automatic
Record Capacity..... Twenty 10 or 12 inch or twenty mixed Records
Turntable Speed..... 78 r.p.m.
Drive..... Motor through reduction gear box direct to turntable
Type Pick-Up..... Magnetic
Pickup Impedance..... 96 ohms at 1,000 cycles
Watts Phono Motor 60 cycle..... 90
50 cycle..... 110

POWER SUPPLY RATING

100-130, 140-160, 195-250 volts, 40-60 cycles..... 410 watts

RECORDER

Cutter Head Magnetic
Impedance of Cutter at 1,000 cycles..... 6 ohms
Turntable Speed 78 r.p.m.
Grooves Cut Per Inch..... 96
Inches Cut Per Minute..... .81
Recording Blank Discs..... Acetate coated metal base
Recording Disc Diameter..... Up to 12 inches
Drive..... Lead screw driven from turntable

PUBLIC ADDRESS USE

Microphone Type..... Velocity (Ribbon) MI-4036-K
Microphone Input Impedance..... 250 ohms
Output to External Speakers..... 500 ohm line
No. of External Speakers..... Up to 30
Power Output 60 watts max.

CABINET DIMENSIONS

Height..... 42 inches
Width..... 42 3/4 inches
Depth..... 22 1/2 inches
Weight Net..... 308 lbs. Shipping..... 470 lbs.
Tuning Drive Ratio..... 25 to 1

TUBE COMPLEMENT

(1) Type-6SK7 R-F Amplifier
(2) Type-6SA7 Oscillator
(3) Type-6SA7 1st Detector
(4) Type-6SK7 1st I-F
(5) Type-6B8G A.V.C. I-F
(6) Type-6U5 Tuning Indicator
(7) Type-6B8G 2nd I-F, 2nd Detector
(8) Type-12SK7 1st Audio
(9) Type-6SC7 Mixer
(10) Type-6J5 Audio
(11) Type-6V6-GT Driver
(12) Type-12SK7 Microphone Pre-Amplifier
(13) Type-6H6 Mic. Volume Limiter
(14) Type-6U5 Recording Indicator
(15) Type-6F6G Power Output
(16) Type-6F6G Power Output
(17) Type-6F6G Power Output
(18) Type-6F6G Power Output
(19) Type-VR150-30 Voltage Regulator
(20) Type-VR105-30 Voltage Regulator
(21) Type-VR105-30 Voltage Regulator
(22) Type-5Y3G Bias Rectifier
(23) Type-5U4G Rectifier
(24) Type-5U4G Rectifier

PILOT LAMPS 16 Type Mazda 44, 6-8 volts

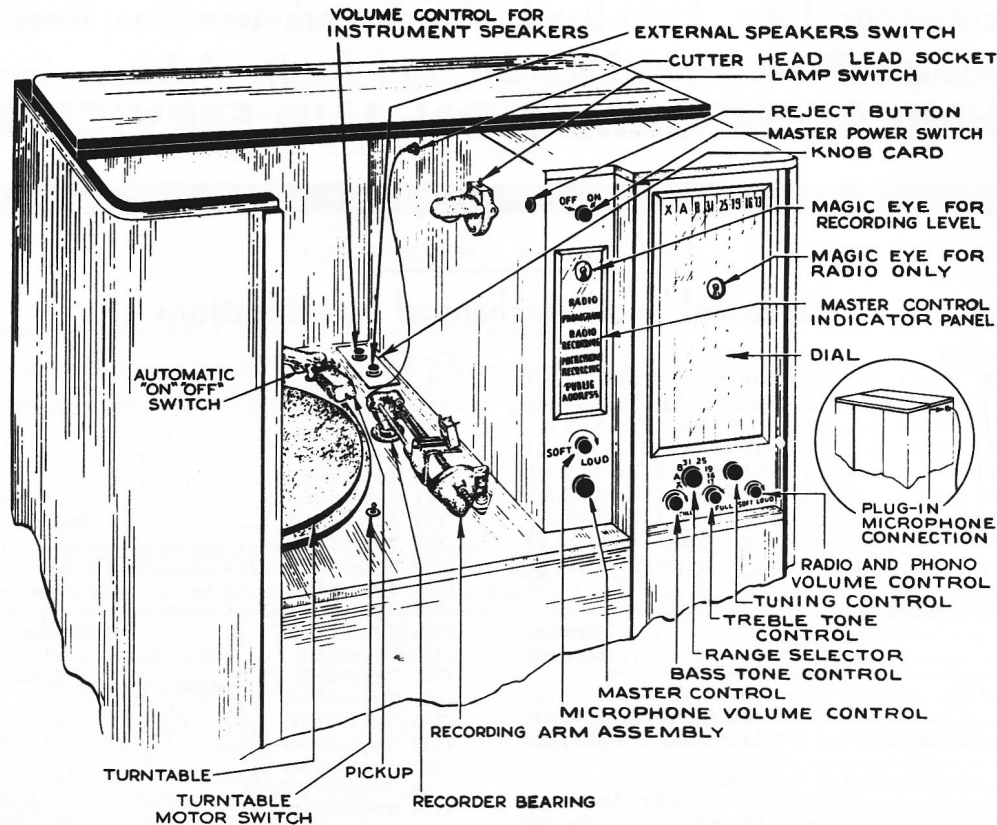


Model QU8

General Description

Model QU8 is a superior-quality Radio-Phonograph Combination which includes: a twenty-four tube superheterodyne radio receiver, a fully automatic phonograph mechanism, a disc recorder, and has provision for use as a Public Address System. Features of design include: Eight Tuning Bands with five "Spread Bands," Two I-F Stages, Controlled Selectivity, Separate Channel AVC, Automatic Tone Control, Automatic Bass Amplifier, Treble Tone Control, Bass Tone Control, Temperature Compensated Tuning Circuits, Twin 12-inch Speakers. The Phonograph will: repeat one record, play in sequence from 3 to 20 records (10-inch, 12-inch or mixed) on both sides automatically; and has: specially designed

Magnetic Pickup, Automatic Bass Amplifier, Acoustic Adaptor Circuit, Powerful Motor, and Treble and Bass controls. The Recorder will record on up to 12-inch discs the following: Radio Programs, Voice or music of an individual or group, Radio programs plus another voice or special music through the Microphone, plus other combinations of Recorder and Microphone. When used as a P. A. System, this instrument will feed up to thirty external speakers, and has a separate monitor speaker control to control volume of the speakers in the cabinet. The Microphone supplied for the Recorder and P. A. System is the high-quality RCA Velocity (Ribbon Type) Microphone.



Operating Controls

Operation

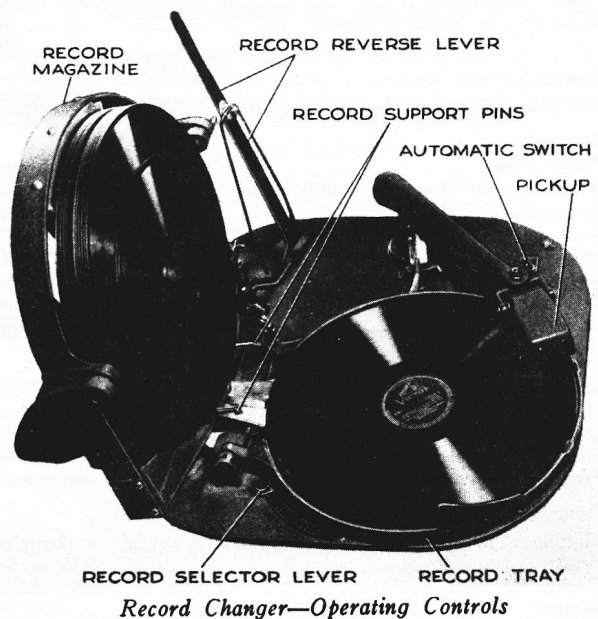
The "Power" Switch above the Master Control Indicator controls the power for all functions of this instrument. The "Master Control" chooses the type of function desired: the full counter-clockwise position of this switch being the "Radio" position, and successively clockwise the positions are: "Phonograph"; "Radio Recording"; "Microphone Recording"; "Radio Recording" and "Microphone Recording"; and "Public Address." These functions are indicated on the "Master Control Indicator" as the "Master Control" switch is turned.

Radio Operation:—

Turn Power Switch "ON," set Master Control to "Radio," set "Range Selector" to band desired, and tune in station desired. Volume is controlled by Volume control on Radio Panel. Adjust Bass and Treble controls as desired. For high-fidelity reception of local stations the Treble Tone control should be turned completely clockwise until the fidelity switch functions.

Phonograph Operation:—

NOTE:—Before Operating Phonograph, make sure that the phono-drive reduction gear box has been filled with the oil supplied with the instrument; and also add a few drops of good quality motor oil (SAE No. 30) to the motor bearings.



1. **Manual Operation:**—Turn Power Switch "ON," turn "Master Control" to "Phonograph." See that "Automatic" Switch at rear of turntable is "OFF." Place record on turntable; turn "Motor" switch at front of turntable to "ON"; place pickup on record; control volume with "Volume Control" on radio panel. Adjust "Bass" and "Treble" controls as desired.

2. **Automatic Operation:**—Turn "Power" Switch "ON"; turn "Master Control" to "Phonograph."

Load the records vertically on the Record Magazine in the order desired.

IMPORTANT:—THE FIRST RECORD, WHICH IS THE FIRST TO BE PLAYED, MUST BE SECURELY PLACED ON THE RECORD SUPPORT PINS AND PUSHED FLUSH AGAINST THE UPPER AND LOWER RECORD SUPPORT SURFACES. The side to be played first should be facing outwards. The other records (up to 20) are then placed on the record support pins in the sequence desired, with the selection to be played first facing outwards. **IMPORTANT:**—NOT LESS THAN 3 RECORDS SHOULD BE PLAYED AUTOMATICALLY. Set the "Record Selector Lever" to play "One side" or "Both Sides," throw the "Automatic" Switch at rear of turntable to "ON," then turn "Motor" switch to "ON."

To repeat a record set the "Record Selector Lever" to "Repeat." To reject a record, push the "Reject" button at top right side of Phono Compartment.

NOTE:—If Automatic Mechanism jams during a cycle, turn "OFF" "Master Power Switch" before clearing cause of jam, as the "Motor" switch does not remove power to phono. motor while mechanism is in cycle.

If Master "Power" Switch is turned "OFF" while the automatic mechanism is "in cycle," the mechanism will finish the cycle when the Master "Power" Switch is next turned "ON."

Recorder Operation:—

Recorder Set Up:—Turn Master Power Switch "ON." Make sure that Automatic Phono. Mechanism is not "in cycle," and turn the "Automatic" Phonograph switch to the "OFF" position. Place the "Auxiliary Recording Turntable Plate" on the turntable, with the key in the plate engaging the slot in the turntable spindle. Place the recording blank on the turntable so that the three holes in the blank line up with the holes in the recording turntable. Place the Recording arm in position, with the hinged mounting spindle in the bearing on the phonograph shelf, and the drive pins in the holes in the recording blank and turntable. The cutter head bracket should be locked in position under the catch at the drive end of the recording arm until used. Place a cutting stylus fully in the cutter head so that the flat side of the stylus is toward the needle screw.

While recording, use a fine hair brush to keep the area ahead of the stylus free from chips and threads.

Before making each recording tighten the screw on the front of the cutting head that holds the cutting stylus. Do not use pliers or wrench.

Radio Recording:—Tune in desired radio program. Turn Master Control to "Radio Recording." Set "Bass Tone Control" fully clockwise and "Treble Tone Control" fully clockwise. Adjust receiver "Volume Control" so that the "Recorder Magic Eye" in the "Master Control Indicator Panel" closes to about a 1/4 inch opening at minimum width for normal volume. Start Turntable with "Motor Switch." When the

desired program comes on, pull down cutter bracket from its catch, move it to opposite end of "Recorder Arm" and place cutting stylus gently on record blank about 1/4 inch from outer rim.

The speaker and "Recorder Magic Eye" both monitor the recording, so that it is possible to hold the necessary recording level during the program. Lift the cutter from the record before it reaches the inner limit of the record, and lock cutter bracket under the cutter catch.

Microphone Recording:—

Set up Recorder.

Turn "Master Control" to "Microphone Recording."

Set "Microphone Volume Control" to the correct level by testing on some of the sound to be recorded. Set control so that the "Recorder Magic Eye" closes to about a 1/4 inch opening at minimum width for normal Volume. The "Microphone Volume Limiter" tube will keep excessively loud sounds to a safe limit. Start turntable. Remove cutter bracket from catch and proceed with recording. Keep "Bass Tone Control" and "Treble Tone Control" maximum clockwise.

Re-Recording:—

Set up Recorder.

Turn "Master Control" to "Radio Recording."

Connect an "RCA Victrola Phonograph Attachment" by plugging an adapter plug into the "Television, FM" jack at the rear of the radio chassis. Turn the attachment volume control full "ON." Place the record it is desired to duplicate on the attachment turntable, and play a portion of it, meanwhile adjusting the "Radio Volume Control" to give the correct recording level in the "Recording Magic Eye." After the correct level has been set, proceed with the recording.

Mixed Radio and Microphone Recording:—

Set up for Recording.

Set "Master Control" so that both "Radio" Recording and "Microphone Recording" are indicated.

Tune in desired radio program.

Set program level same as in "Radio Recording."

Set Microphone Volume Control same as in "Microphone Recording."

Proceed with recording.

Mixed Microphone and Record Recording or Re-Recording:—

Set up for Recording.

Set "Master Control" so that both "Radio Recording" and "Microphone Recording" are indicated.

Proceed as stated in "Microphone Recording" and "Re-recording."

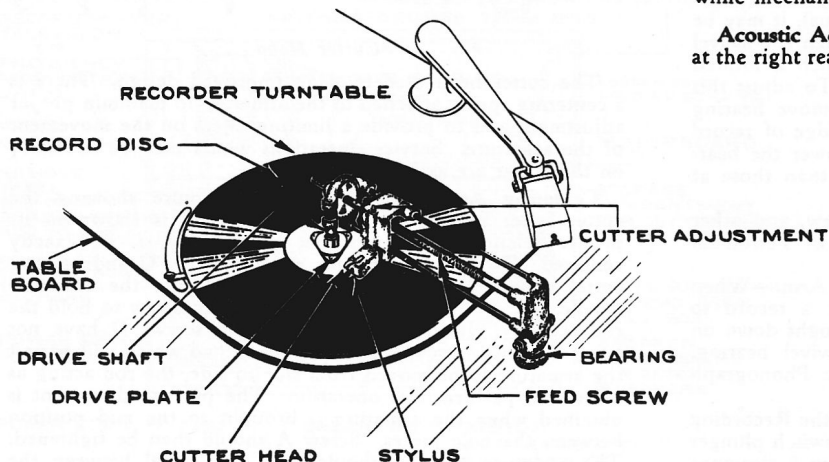
Playback:—

To play back after recording, remove the drive and recorder arm from the turntable spindle, and place on the pin at the right front of the cabinet. Remove the "Auxiliary Recording Turntable." Proceed as under "Manual" Phonograph operation.

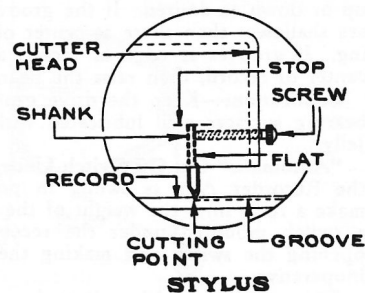
IMPORTANT: Before playing the Automatic Phonograph after recording, make sure the Recording Turntable plate is removed.

If Automatic Mechanism jams during cycle for any reason, throw "Master Power Switch" "OFF", as the turntable "Motor Switch" will not cut off current to motor, while mechanism is in cycle.

Acoustic Adaptor:—An "Acoustic Adaptor" switch located at the right rear corner of the radio chassis can be used to adapt



Recorder in Operation



the instrument to different types of locations for phono reproduction, by varying the balance between high and low frequency response as desired.

Public Address Use:—

Microphone Pickup:—Turn Power Switch "ON."

Turn "Master Control" to Public Address position.

If external speakers are connected, turn External Speaker Switch, located at the right hand rear corner of phonograph compartment, clockwise, to put these in operation.

Set "Microphone Volume Control" to give desired Volume

in Speakers. If the Speakers in the cabinet are too loud and "Feedback" occurs, the volume on these speakers can be reduced by turning down the "Instrument Speaker Volume Control" located in back of the "External Speaker" switch.

Radio or Record Program:—If it is desired to send Radio programs or Record programs over the External Speaker system, the instrument is operated in the normal manner for "Radio" or "Phonograph" operation, and the "External Speaker" switch is then turned for "External Speaker" operation.

Recording and Playback Notes IMPORTANT

The cutting point of the stylus must be in perfect condition in order to make good recordings.

The condition of the stylus point can not be determined by ordinary visual inspection. If the recordings are noisy or poor in quality, first try a new stylus.

The stylus cutting point can be ruined by dropping the cutter on the record, by cutting into the base metal of the recording blank, or by cutting into the paper label on the blank.

Always stop the recorder before it reaches its inner limit as it will repeat in the last groove and may wear into the base metal, thereby ruining the stylus point. See that the instrument is perfectly level.

CUTTER ADJUSTMENT

To adjust the stylus pressure for the correct depth and width of cut, the best procedure is to cut some "blank" grooves in a recording disc of the type that will be used: The stylus pressure can be regulated, by means of the adjustment screw on top of the cutter bracket, to produce the correct thickness of the hair-like cuttings. The cuttings should collect toward the center of the recording disc. If they collect toward the outside the stylus is not correctly inserted, and must be adjusted by removal and re-insertion. If the threads continue to collect toward the outside, use a new stylus.

The cuttings should be even, thin, hair-like threads about three-thousandths of an inch across or approximately the diameter of a human hair.

The groove width should almost equal, but not exceed, the distance between grooves. A magnifying glass is helpful in examining the grooves. If the grooves are too shallow, the phonograph needle will slide over them on playback. If the grooves are cut too deep, rumble will be excessive.

After examining the cuttings and the groove width, adjust the cutter pressure as required by means of the adjustment screw on top of the cutter bracket. Turn this clockwise to increase pressure and increase depth of groove. Turn counter-clockwise to decrease pressure and decrease depth of groove.

Check the new adjustment by running more blank grooves.

Check the cuttings and groove width each time a new stylus is inserted, and whenever a different type of recording disc is used. Due to variations in material composition and hardness among different types of discs, the same cutting-pressure adjustment will not give an equal depth of cut on all types. Thus, it may be necessary to change the adjustment previously set for one type of disc, when recording on a different type.

Excessive cutting pressure will cause rumble. The width of the groove should almost equal, but not exceed, the distance between grooves.

Check the groove width each time a new stylus is used, and each time a new disc is used.

When recording, use the maximum bass response, by turning the bass control to the maximum clockwise position.

On play-back, use the least bass response, by turning the Bass control to the maximum counter-clockwise position.

Be certain that the motorboard and mechanism is "floating" free from the cabinet.

Recorder Service

Cutter Head Drive:—The cutting head drive screw (lead screw) should rotate freely and be free from end play. If end play is present loosen the jamb screw which locks the cone point bearing located at end away from driving gear and adjust this bearing until end play is eliminated (being careful not to cause binding), then tighten jamb screw.

Cutter Head Mounting:—Two cone pointed set screws support the cutter head and its mounting bracket. These should be adjusted to prevent end play but to permit free movement of the cutter head up and down.

Record Threads:—Keep the drive gears and lead screw free from record threads.

Equalizing Groove Width:—In order to keep the groove width cut at the inside and outside of record equal, it may be necessary to adjust the spindle bearing into which the swivel spindle of the recording arm is placed, and which is located at the right hand center of the phono board. To adjust this bearing loosen the set screw in the base and move bearing up or down as desired. If the grooves at the edge of record are shallower than those at center of record, lower the bearing. If grooves at edge of record are deeper than those at center of record, then raise the bearing.

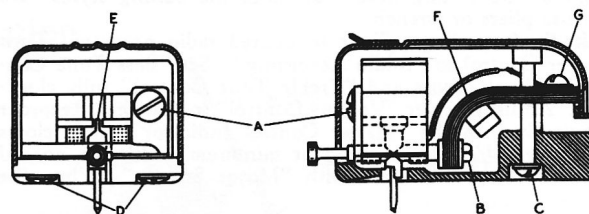
Lubrication:—Keep the drive gears, lead screw, and other bearing surfaces well lubricated with Vaseline or Petroleum Jelly.

"Automatic" Cut-Off Switch Under Recorder Arm:—When the Recorder Arm is swung in position over a record to make a recording, the weight of the arm is brought down on a switch mounted under the recorder arm swivel bearing, opening the switch and making the Automatic Phonograph inoperative.

This switch should be adjusted so that when the Recording Arm is on its rest, the switch is closed; i. e. the switch plunger is all the way up; and there should be about $\frac{1}{32}$ -inch clearance between the top of switch, and the swivel shaft. When the

Recording Arm is in the recording position, the switch is open; i. e. the switch plunger is pushed down.

Cutter Head:—



Cutter Head

The cutter head used is of an improved design. There is a centering spring attached to the armature to maintain proper adjustment and to provide a limiting effect on the movement of the armature. Service operations which may be necessary on the cutter are as follows:

Centering Armature:—Refer to the figure showing the cutter inner structure. The armature "E" is shown in its proper relation to the magnet pole pieces, i. e., exactly centered. To center armature remove screw C and remove cutter cover. Insert a small rod or nail into the armature needle hole and tighten the needle holding screw to hold the rod securely. If the armature clamping screws D have not been disturbed, screw A should be loosened which will permit the armature to be moved from side to side, the rod acting as a lever to perform this operation. The proper adjustment is obtained when the armature is brought to the mid position between the pole pieces. Screw A should then be tightened. The armature position should then be central between the pole pieces and at right angles to them. Check to make sure

that the armature is not touching the coil. The air gap between the pole pieces and the armature should be kept free from dust, filings, and other foreign material which would obstruct the movement of the cutter armature.

Replacing Coil:—Remove the cutter cover by removing screw C. Remove screws D and A and lift magnet off coil assembly. Unsolder coil leads. Remove coil and bakelite board on which it is mounted. Replace with new coil and mounting board. Replace magnet. Replace screws A and D. Solder new leads. Tighten screws D so that the armature is perpendicular to the pickup base. Center armature as described above.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the speaker voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep test-oscillator output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The "0°" mark on the drum scale must be horizontal, and a line drawn through the 0° and 180° marks on the scale should be parallel with the top of the chassis when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

To determine the corresponding frequency for any setting of the calibration scales, refer to the accompanying drawing which shows the dial with 0-180° calibration scales drawn at the sides.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "0°" mark on the calibration scale when the plates are fully meshed.

Spread-Band Alignment.—The most satisfactory method of aligning or checking the spread-band ranges is on actual reception of short-wave stations of known frequency, by adjusting the magnetite-core oscillator coil for each band so that these stations come in at the correct points on the dial.

In exceptional cases, when the set is being serviced in a location where the noise level is high enough to prevent reception of short-wave stations, a test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials. The frequency settings of the test-oscillator may be checked by one or both of the following methods:

1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment

To Replace Viscoloid Damping Block (F) or Replace Armature E:—Remove cover. Remove screws G. Remove screws D and A. Remove magnet assembly. Unsolder coil leads. Remove coil assembly. Remove armature and viscoloid block. Remove nut B. Remove viscoloid from armature. Replace either new armature, new viscoloid or both as desired. When replacing nut B make sure that viscoloid is parallel to the armature and that it will not twist the armature when clamped under screws G. Tighten nut B so that viscoloid is firmly fastened on shaft. Replace parts in reverse order as removed above. Center armature as described above.

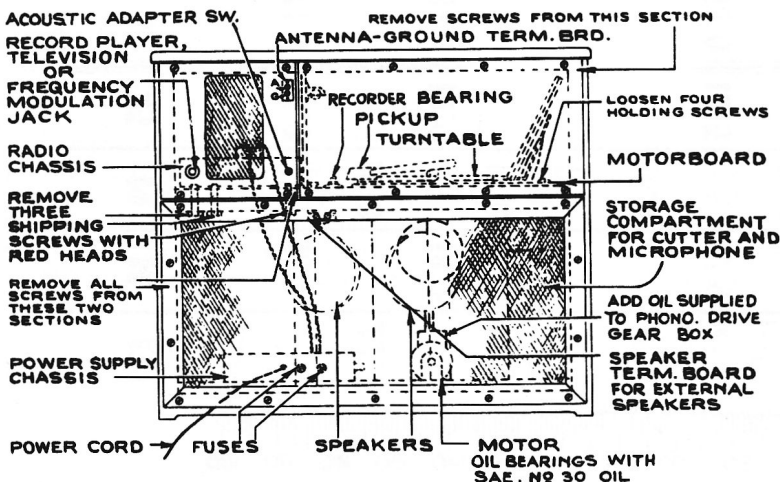
frequencies) by zero-beating the test-oscillator against short-wave stations by known frequency.

2. Use harmonics of the standard-broadcast range of a test-oscillator, first checking the frequency settings on this range by means of a crystal calibrator (RCA Stock No. 9572), or by zero-beating against standard broadcast stations.

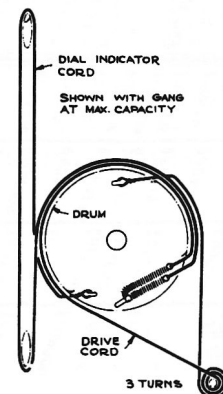
When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the magnetite-core oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.

Precautionary Lead Dress:

- (1) All oscillator leads should be kept as short as possible.
- (2) Lead from No. 8 on S1 must be held to 3 in. length and dressed toward the bottom end of coils, away from coil windings.
- (3) Lead from No. 9 on S1 must be held to 3 in. length and dressed toward the bottom end of coils, away from coil windings.
- (4) Lead from No. 5 on S2 must be held to 5 in. length.
- (5) Lead from No. 8 on S5 must be held to 4 1/4 in. length.
- (6) Lead from Det. coil L17 to trimmer must be held to 2 1/4 in. length.
- (7) Lead from Det. coil L18 to No. 2 on S8 must be held to 5 3/8 in. length.
- (8) The leads from the top and arm of the microphone volume control should be dressed away from the pilot light leads and toward the pre-amplifier shield.
- (9) The condenser from the volume control arm to the first audio tube must be shielded and the lead on the tube side as short as possible.
- (10) The leads to the selectivity switch must be dressed along the side of the chassis away from the R.F. coils.
- (11) Keep pilot light leads as far as possible away from oscillator coils.
- (12) Dress leads to low frequency tone control on outside of chassis under bracket.
- (13) The long ground lead from the oscillator heater must be kept away from all condensers, resistors, and leads to RF tubes.
- (14) Dress all filament leads away from oscillator and detector grid lugs.
- (15) C-14 (2700 mmf) and C-72 (120 mmf) must be dressed toward A osc. trimmer, C-17.

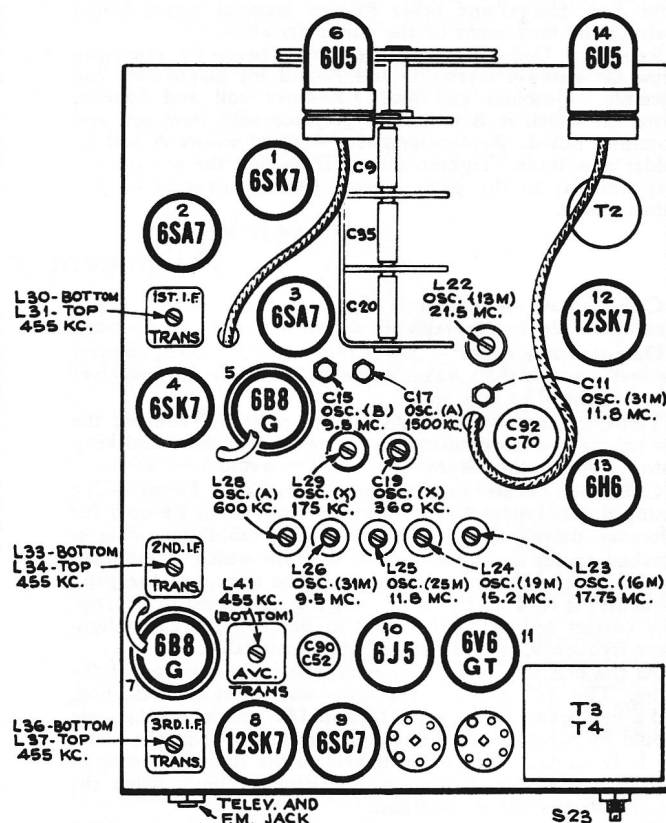
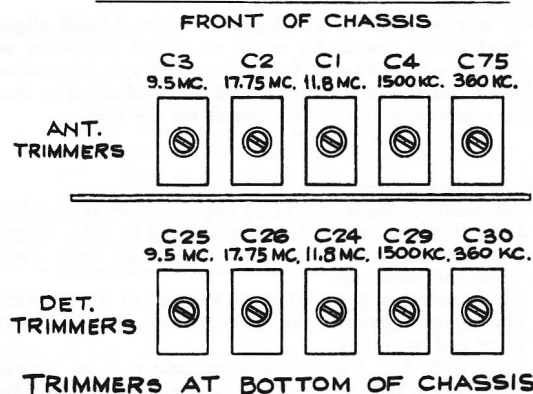


Rear View of Instrument



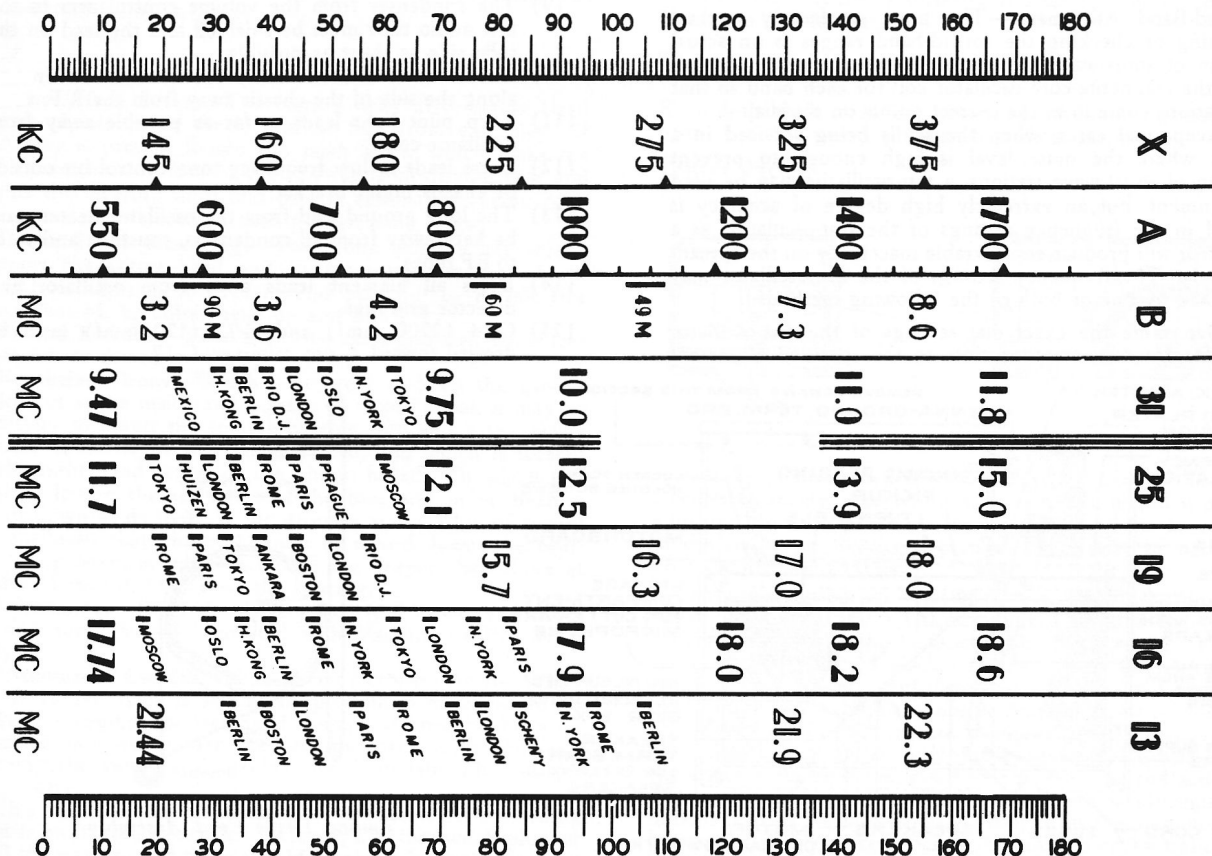
Tuning Drive Cord Assembly

Top View—Power Unit



Tube and Trimmer Locations

IMPORTANT:—IF ANY ONE OF THE VOLTAGE REGULATOR TUBES Nos. 19, 20, 21, ARE OUT OF THEIR SOCKETS THE INSTRUMENT WILL NOT OPERATE, AS THE A.C. CIRCUIT WILL BE OPEN.



Dial Scale and Calibration Scale

Step	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	Turn selectivity control maximum counter-clockwise for maximum selectivity.			
2	6B8G 2nd I-F grid in series with .01 mfd.	455 kc	“A” Band quiet point between 550-750 kc	L37, L36 Third I-F Transformer
3	6SK7 1st I-F grid in series with .01 mfd.			L34, L33 Second I-F Transformer
4	6SA7 1st Det. grid in series with .01 mfd.			L31, L30 First I-F Transformer
5	With selectivity control in broad position retouch L37, L36 for selectivity curve 2.			
5A	With selectivity control in sharp position see that curve 1 has not changed appreciably.			
6	6SA7 1st Det. grid in series with .01 mfd.	455 kc	“A” Band quiet point between 550-750 kc	L41 AVC Transformer See Note 1
7	Antenna Terminal in series with 200 mmfd.	360 kc	“X” Band 360 kc (149°)	C19 (osc.)** C30 (det.) C75 (ant.)
8		175 kc	“X” Band 175 kc (51°)	L29 (osc.) (Rock-in)
9	Repeat steps 7 and 8.			
10	Antenna Terminal in series with 200 mmfd.	1,500 kc	“A” Band 1,500 kc (150.5°)	C17 (osc.) C29 (det.) C4 (ant.)
11		600 kc	“A” Band 600 kc (26°)	L28 (osc.) (Rock-in)
12	Repeat steps 10 and 11.			
13	Antenna Terminal in series with 300 ohms	9.5 mc	“31M” Band 9.5 mc (21.5°)	L26 (osc.)*** C25 (det.) C3 (ant.)
14		11.8 mc	“31M” Band 11.8 mc (169.5°)	C11 (osc.)***
15		Repeat steps 13 and 14 until dial tracks correctly.		
16		9.5 mc	“B” Band 9.5 mc (172.5°)	C15 (osc.)***
17		11.8 mc	“25M” Band 11.8 mc (36°)	L25 (osc.)*** C24 (det.) C1 (ant.)
18		15.2 mc	“19M” Band 15.2 mc (37°)	L24 (osc.)***
19		17.75 mc	“16M” Band 17.75 mc (28°)	L23 (osc.)**** C26 (det.) C2 (ant.)
20		21.5 mc	“13M” Band 21.5 mc (59°)	L22 (osc.)****

NOTE 1: Connect oscilloscope to junction of R8 and C42. Also short junction of R11 and R12 to ground.

** Core of L29 should be approximately $\frac{1}{8}$ -inch out before adjusting C19.

*** Use minimum capacity or inductance peak.

**** Use maximum inductance peak.

NOTE.—Oscillator tracks above all signals except on 16 and 13 meter bands.



I.F. Selectivity Curves

At Left—"Sharp"

At Right—"Broad"



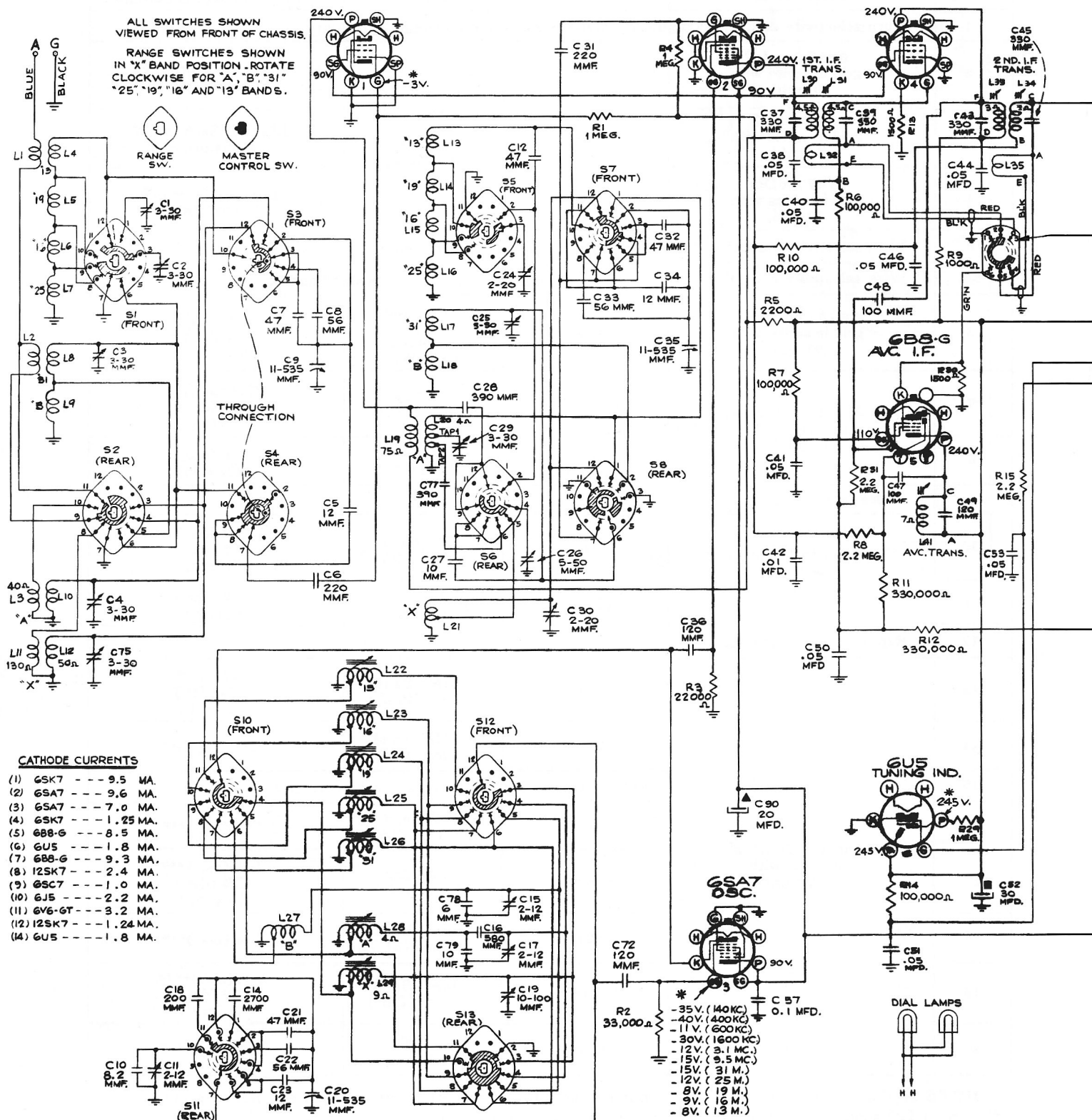
BOTTOM VIEW OF
TUBE SOCKETS.

GSK7
R.F.

GSA7
1ST. DET.

G6K7
1ST. I.F.

ALL SWITCHES SHOWN
VIEWED FROM FRONT OF CHASSIS.
RANGE SWITCHES SHOWN
IN "X" BAND POSITION. ROTATE
CLOCKWISE FOR "A", "B", "31",
"25", "19", "16" AND "13" BANDS.



Schematic Diagram—R. F. Unit

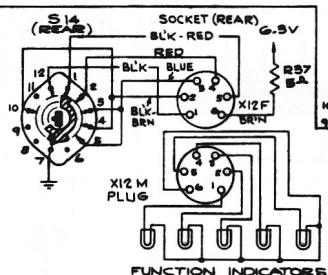
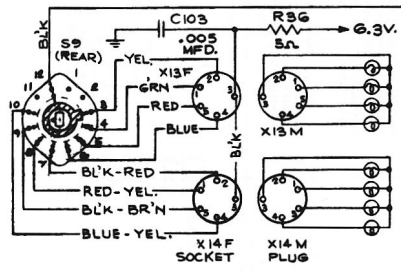
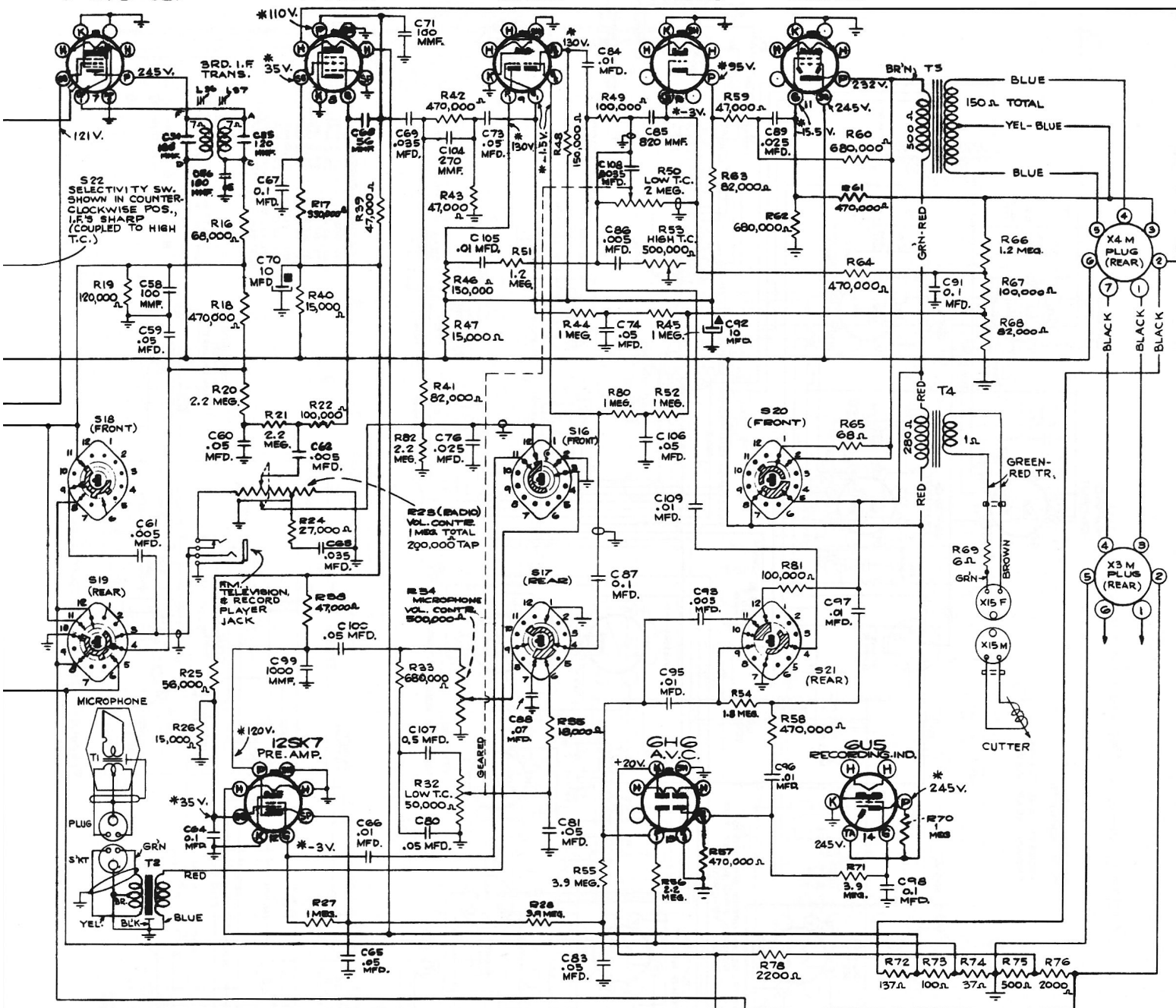
6B8G
2ND I.F. 2ND DET.

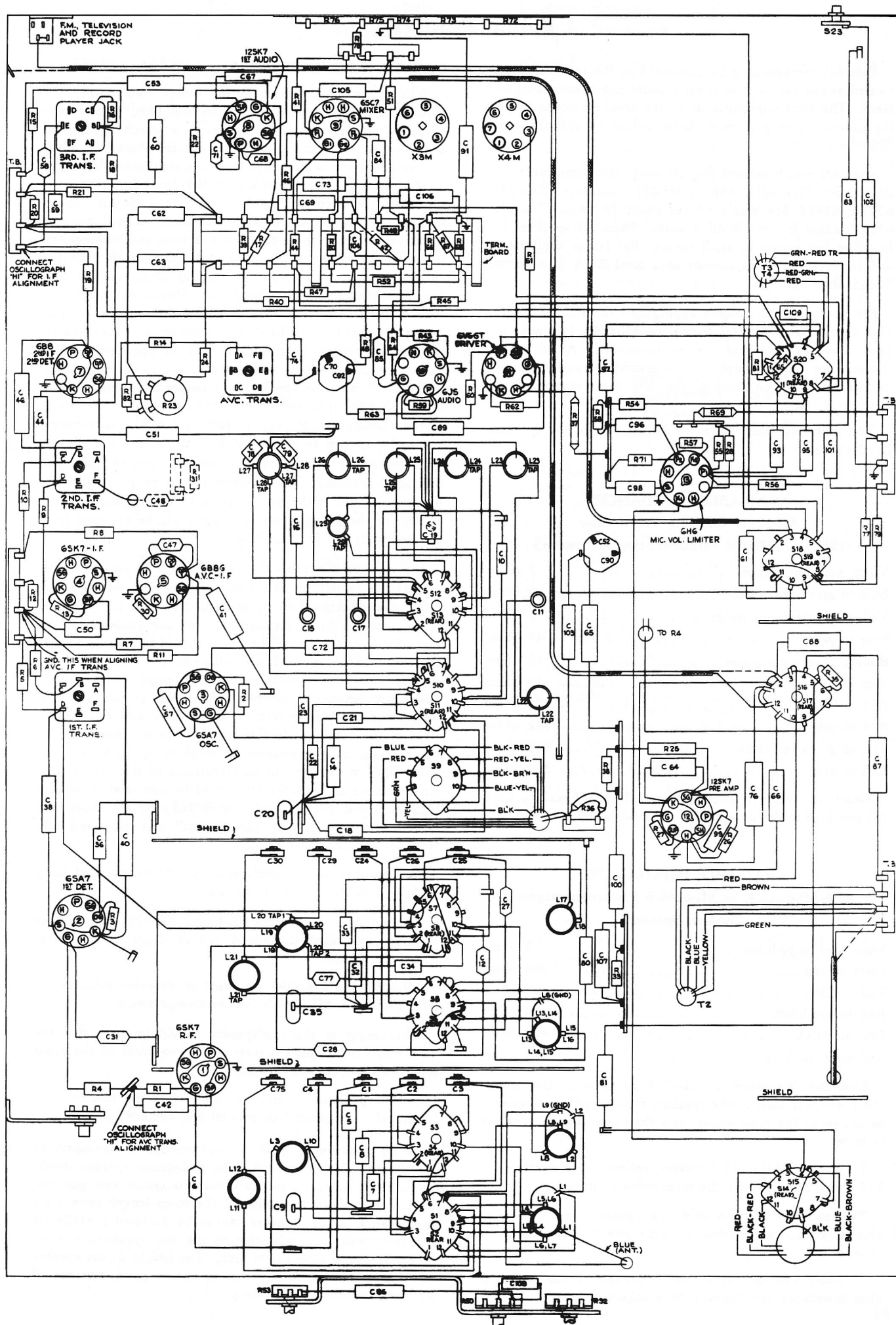
12SK7
1ST. AUDIO

6SC7
MIXER

6J5
AUDIO

6V6GT
DRIVER





Bottom View—R. F. Unit—Showing Location of Parts

Public Address

External speakers may be connected to the terminal board located at the rear of the cabinet under the phono compartment. The total impedance of all the speakers connected to the instrument in parallel or series should be approximately 500 ohms.

Speakers recommended for use with this instrument are RCA MI-6247A, MI-6248B or MI-6233 Speakers. The MI-6247A, 6248B Speakers are rated about 10 watts. The MI-6233 Speaker is rated about 4 watts. These are speakers for handling low power in small rooms. For larger auditoriums and larger installations consult your local RCA Commercial Sound Distributor.

For outdoor, high volume applications the RCA MI-6260 (20 watts), MI-6255 (60 watts), or MI-6264 (50 watt coaxial speaker) Speakers are recommended. As all these speakers are 15 ohm impedance, a matching transformer will be needed to match them to the 500 ohms output of the instrument.

The following tables show the impedances of the speakers listed above.

AVAILABLE IMPEDANCES

MI-12315 Coupling Transformer

(Used in MI-6233 Permanent-magnet Speaker)

Voice coil impedance.....	6 ohms
Blue to green-red tracer	2 ohms
Yellow to green-red tracer	6 ohms
Blue to yellow	15 ohms
Black to green-red tracer	36 ohms
Blue to black	55 ohms
Red to black	225 ohms
Red to yellow	342 ohms
Red to green-red tracer	438 ohms
Red to blue	500 ohms

Note: As shipped from factory, MI-6233 Speakers have red and blue leads connected to terminal board.

AVAILABLE IMPEDANCES

RCA-MI-6247-A or MI-6248-B Permanent-magnet

Dynamic Speaker

Voice coil impedance	2 ohms
Black to red	5,000 ohms
Red to blue	2,500 ohms
Red to red-black	1,250 ohms
Blue to black	410 ohms
Red-black to blue	225 ohms

Example: To match 2 MI-6233 Speakers to the instrument, connect each of the speakers for 342 ohms impedance as shown in the table above, and then connect the speakers in series.

To match 3 MI-6233 Speakers, connect each speaker for 225 ohms, then connect the three speakers in series.

To match 2 MI-6247A or 6248B Speakers choose the 225 ohm impedance, and connect the primaries of the transformers in series.

To match 3 MI-6247A or 6248B Speakers, choose the 1,250 ohm impedance and connect the speakers in parallel.

LOCATING LOUDSPEAKERS

When installing loudspeakers, either temporarily or permanently, the installation will be simplified if one considers the loudspeaker to be similar to a search light. The sound waves from the loudspeaker are distributed in much the same manner as light rays from a search light. If a sufficient amount of the sound waves, either direct from the loudspeakers or reflected from hard surfaces, reach the microphone the system will howl. This is technically termed acoustic feedback, because the amplified sound from the loudspeakers is picked up by the microphone and fed back through the amplifier, where it adds to the original sound until a continuous whistle or howl is produced. Directional projectors, such as the 25-watt loudspeaker (MI-6260) will, to a great extent, prevent howling by directing the sound waves to a restricted area and the amplifier can then be operated at much greater volume. When two speakers are used in an auditorium, hall, etc., the speakers and microphone should be so located that the speakers will be slightly in front of the microphone. Locate one speaker on each side of the microphone and as far from it as possible without destroying the illusion that the sound being heard is actually coming from the direction of and at the proper angle to the audience so that as little of the sound waves as possible will be reflected from the side walls and hard surfaces.

It is not recommended that loudspeakers be located in the rear of the auditorium to provide coverage for this area, but rather that directional sound projectors be used and raised to a sufficient height to be directed into the audience at the rear of the seating area. The horns should be located so that the center of the sound beam will strike the floor at a point slightly more than two-thirds of the length of the room. There are occasions, however, where this is not practical, because of the high reverberation or poor acoustical conditions of the building. In this condition better results can be obtained by using a number of speakers operating at comparatively low volume. In an installation of this type a sufficient number of loudspeakers should be used and so located that the sound will be evenly distributed over the entire area in such a manner that an individual will hear the sound only from the speaker nearest him.

In a small room, the loudspeaker should be mounted fairly high, and in the center of one wall.

The RCA MI-6292, MI-6294 and MI-6233 loudspeaker housings are tilted downward twenty degrees for correct sound distribution.

MI-6292 and MI-6294 are tilted loudspeaker cabinets for MI-6248B and MI-6247A Speakers respectively.

The height of the loudspeaker should be such that the center axis points toward seats about two-thirds of the room length away from the speaker.

In a large room, it may be necessary to use two or more loudspeakers connected in parallel and correctly phased.

In an auditorium, RCA auditorium-type loudspeakers of correct type should be used. The auditorium speaker should be centered on the front wall, with its center axis pointing toward seats about two-thirds of the room length away from the speaker. If the speaker cannot be centered laterally on the front wall, it is advisable to use two speakers, one on each side of the proscenium arch. The height of the speaker or speakers should be sufficient to ensure good coverage of all seats, including the balcony.

Replacement Parts

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

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
CHASSIS ASSEMBLIES			
37206	Arm—Trip arm used on high frequency tone control	37212	Gear—Gear and hub used on Stock No. 37196 tone control shaft
35642	Calibrator—Drive drum calibrator scale	37211	Hub—Microphone volume control shaft bracket and hub
12714	Capacitor—Air trimmer—medium 2-12 mmfd.	37882	Jack—Double circuit phone jack
36631	Capacitor—Mica trimmer comprising 3 sections of 2-20 mmfd. each, 1 section of 5-50 mmfd. and 1 section of 3-30 mmfd.	37609	Lever—Arm and lever for tone control switch
36630	Capacitor—Mica trimmer comprising 5 sections of 3-30 mmfd. each	37207	Link—Link assembly actuated by Stock No. 37206 trip arm
35646	Capacitor—6 mmfd.	37192	Plug—6-prong male plug for power supply cable
33381	Capacitor—8.2 mmfd.	14404	Plug—7-prong male plug for power supply cable
36636	Capacitor—Mica trimmer—1 section 8-80 mmfd.	31048	Plug—Single prong phono input cable plug
13200	Capacitor—10 mmfd., moulded mica	35630	Pulley—Drive cord pulley
37621	Capacitor—10 mmfd., silvered mica	36842	Resistor—5 ohms, 1 watt
33380	Capacitor—12 mmfd., ceramic	37622	Resistor—6 ohms, 1 watt
37618	Capacitor—12 mmfd., silvered mica	37204	Resistor—Voltage divider comprising a 137-100-37-500 and 2,000 ohm section
13141	Capacitor—47 mmfd., moulded mica	5201	Resistor—220 ohms, $\frac{1}{2}$ watt
33102	Capacitor—47 mmfd., ceramic	34766	Resistor—1,000 ohms, $\frac{1}{2}$ watt
37329	Capacitor—47 mmfd., silvered mica	14499	Resistor—1,500 ohms, $\frac{1}{2}$ watt
12723	Capacitor—56 mmfd., moulded mica	30654	Resistor—1,500 ohms, $\frac{1}{2}$ watt
36843	Capacitor—56 mmfd., ceramic	34767	Resistor—2,200 ohms, $\frac{1}{2}$ watt
37619	Capacitor—56 mmfd., silvered mica	30128	Resistor—12,000 ohms, $\frac{1}{2}$ watt
12720	Capacitor—100 mmfd.	36714	Resistor—15,000 ohms, $\frac{1}{2}$ watt
12724	Capacitor—120 mmfd., moulded mica	5114	Resistor—15,000 ohms, 1 watt
31813	Capacitor—120 mmfd., mica	3219	Resistor—18,000 ohms, $\frac{1}{2}$ watt
37620	Capacitor—200 mmfd.	13998	Resistor—22,000 ohms, $\frac{1}{2}$ watt
12694	Capacitor—220 mmfd., moulded mica	12738	Resistor—27,000 ohms, $\frac{1}{2}$ watt
36616	Capacitor—220 mmfd., mica	12454	Resistor—33,000 ohms, $\frac{1}{2}$ watt
30964	Capacitor—330 mmfd., mica	12412	Resistor—47,000 ohms, $\frac{1}{2}$ watt
13894	Capacitor—390 mmfd.	30787	Resistor—47,000 ohms, watt
33235	Capacitor—580 mmfd.	30650	Resistor—56,000 ohms, watt
12536	Capacitor—820 mmfd.	13715	Resistor—68,000 ohms, watt
37617	Capacitor—1,000 mmfd.	14023	Resistor—82,000 ohms, $\frac{1}{2}$ watt
30057	Capacitor—2,700 mmfd.	14560	Resistor—100,000 ohms, $\frac{1}{2}$ watt
30851	Capacitor—.0035 mfd.	3252	Resistor—100,000 ohms, $\frac{1}{2}$ watt
30852	Capacitor—.005 mfd., 500 volts	13734	Resistor—120,000 ohms, $\frac{1}{2}$ watt
5242	Capacitor—.005 mfd., 1,000 volts	30493	Resistor—150,000 ohms, $\frac{1}{2}$ watt
30854	Capacitor—.007 mfd.	12199	Resistor—270,000 ohms, $\frac{1}{2}$ watt
30855	Capacitor—.01 mfd.	14983	Resistor—330,000 ohms, $\frac{1}{2}$ watt
30859	Capacitor—.025 mfd.	30784	Resistor—330,000 ohms, $\frac{1}{2}$ watt
30857	Capacitor—.035 mfd.	30648	Resistor—470,000 ohms, $\frac{1}{2}$ watt
30847	Capacitor—.05 mfd.	12413	Resistor—680,000 ohms, $\frac{1}{2}$ watt
30858	Capacitor—.07 mfd.	30562	Resistor—680,000 ohms, $\frac{1}{2}$ watt
30848	Capacitor—.01 mfd.	12013	Resistor—1 meg., $\frac{1}{10}$ watt
12741	Capacitor—.05 mfd.	13730	Resistor—1 meg., $\frac{1}{2}$ watt
32342	Capacitor—Electrolytic, comprising 2 sections of 10 mfd., 450 volts	30208	Resistor—1.2 meg., $\frac{1}{2}$ watt
35017	Capacitor—Electrolytic, comprising 1 section of 30 mfd., 350 volts, and 1 section of 20 mfd., 150 volts	31449	Resistor—1.5 meg., $\frac{1}{2}$ watt
37210	Clip—Spring clip for volume control shaft	12679	Resistor—2.2 meg., $\frac{1}{2}$ watt
34649	Coil—Antenna coil—"A" band	13167	Resistor—3.9 meg., $\frac{1}{2}$ watt
34647	Coil—Antenna coil—"B" and 31 meter band	30992	Resistor—10 meg., $\frac{1}{2}$ watt
32823	Coil—Antenna coil—"X" band	14350	Screw—No. 8-32 square head set screw
36629	Coil—Antenna coil—"25-19-16-13" meter bands	37209	Shaft—Radio volume control extension shaft
36632	Coil—Oscillator coil—"A" and "B" bands	37194	Shaft—Tuning shaft and flywheel
31837	Coil—Oscillator coil—"X" band	4452	Shield—Tube shield
36617	Coil—Oscillator coil—"13 meter" band	34799	Socket—6-contact "Magic Eye" socket
34657	Coil—Oscillator coil—"16 meter" band	31251	Socket—8-contact tube socket
36633	Coil—Oscillator coil—"19 meter" band	31365	Socket—Band indicator lamp socket
36634	Coil—Oscillator coil—"25 meter" band	31364	Socket—Pilot lamp socket
36635	Coil—Oscillator coil—"31 meter" band	13638	Spring—Drive cord or pointer drive cord spring
34652	Coil—R.F. coil—"A" band	31261	Spring—Retaining spring for oscillator coils, cores, and studs
34650	Coil—R.F. coil—"B" and "31 meter" bands	37205	Support—Drive cord pulley support only—less pulleys and rubber grommet
33765	Coil—R.F. coil—"X" band	37201	Switch—Function switch
34651	Coil—R.F. coil—"25-19-16-13" meter bands	37344	Switch—Phonograph fidelity switch
34645	Condenser—3-gang variable tuning condenser	37193	Switch—Range switch
37832	Connector—3-contact female socket as used on microphone and cutter cables	37208	Switch—Tone switch actuated by Stock No. 37207 link assembly
12493	Connector—5-contact female socket as used on band indicator cable	37202	Transformer—First I.F. transformer
11934	Connector—6-contact female socket as used on function lamp cable	36614	Transformer—Second I.F. transformer
37197	Control—H.F. tone control	36615	Transformer—Third I.F. transformer
37196	Control—L.F. tone control (long shaft)	37203	Transformer—AVC, I.F. transformer
37214	Control—L.F. tone control (short shaft)	37343	Transformer—Driver audio transformer
37198	Control—Microphone volume control complete with flexible and control shafts	30251	Transformer—Microphone transformer
37195	Control—Radio volume control	2917	Washer—"C" washer for tuning shaft, microphone volume control shaft, or radio volume control shaft
32634	Cord—Pointer drive cord—50-inch length with clips	33726	Washer—"C" washer to hold pulley
35788	Core—Adjustable core and stud for "A" and "B" band oscillator coil	POWER AND AMPLIFIER UNIT	
31259	Core—Adjustable core and stud for "13 meter" band, "16 meter" band, "19 meter" band, "25 meter" band, and "31 meter" band oscillator coils	30859	Capacitor—.025 mfd.
36093	Core—Adjustable core and stud for "X" band oscillator coil	37250	Capacitor—20 mfd.
35627	Drum—Drive drum—less calibrator scale	37248	Capacitor—20-10 mfd.
37213	Gear—Gear and hub used on Stock No. 37214 tone control shaft	37308	Capacitor—40 mfd.
		35016	Capacitor—1 section of 40 mfd., and 1 section of 100 mfd.
		37249	Capacitor—100 mfd.
		37307	Choke—Filter choke
		30868	Connector—2-contact female connector for reject cable
		37625	Connector—5-contact female connector for record changer cable
		12493	Connector—5-contact female connector for speaker cable

Replacement Parts (Continued)

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
11934	Connector—6-contact female connector for speaker cable	37259	Housing—Wooden band indicator lamp housing
37626	Connector—8-contact female power supply cable connector	13103	Jewel—Pilot light jewel only
14409	Connector—7-contact female connector for power supply cable	37256	Knob—Large control knob and spring
35052	Connector—8-contact male connector for attenuator cable	37257	Knob—Small control knob and spring
32059	Holder—Fuse holder with extractor	11891	Lamp—6.3 volt pilot lamp—Mazda No. 44
33960	Plug—Single contact phono input cable plug	37823	Lamp—115 volt, 7½ watt frosted compartment lamp bulb
36637	Receptacle—A.C. receptacle	37266	Plate—11 inch finished auxiliary plate for turntable
37253	Relay—Bias relay switch	37270	Plug—2-contact male plug for phono motor power cable
37254	Relay—Record changer relay switch	37290	Plug—2-prong male plug and shell for cutter base plunger switch cable and compartment lamp cable
34761	Resistor—10 ohms, ¼ watt	30870	Plug—2-prong male plug for reject button cable
37623	Resistor—27 ohms, ¾ watts	37244	Plug—3-prong male plug and shell for pilot lamp cable
37624	Resistor—50 ohms, 5 watts	12567	Plug—5-prong male plug used on dial frame cable
37252	Resistor—Voltage divider comprising a 250, 940, and a 400 ohm section	11953	Plug—6-prong male plug for function panel
37251	Resistor—2,000 ohms, 5 watts	31048	Plug—Single contact plug for phono input cable
30685	Resistor—33,000 ohms, ¼ watt	37261	Pointer—Station selector pointer and carriage
33165	Socket—2-contact female socket	37825	Reflector—Compartment lamp reflector only—less housing and lamp
37255	Socket—3-contact female socket	37288	Screen—Diffusing screen for function lamp housing
35279	Socket—5-prong tube socket	37260	Screen—Diffusing screen for Stock No. 37259 housing
31251	Socket—8-prong tube socket	33438	Screw—Thumb screw for "Magic Eye" clip
37246	Transformer—105-120 volts, 50-60 cycle bias power transformer	31199	Shield—Lamp shield for jewel light
37245	Transformer—110-125-150-210-240 volts, 50-60 cycle power transformer	37173	Sleeve—Cutter base adjusting sleeve
37247	Transformer—Output transformer	31364	Socket—Bayonet socket with clip for pilot lamp
RECORDER ASSEMBLY MI-4832		30900	Spring—Control knob spring
37171	Base—Main recorder base	37265	Switch—2-gang speaker switch
37161	Bracket—Carriage stop bracket	37668	Switch—Master power switch
37162	Bracket—Feed bracket engages with feed screw	37306	Switch—Motor control toggle switch
37160	Carriage—Main carriage and pin	32875	Switch—Phono motor off-on switch
37163	Center—Conical feed screw center—used on drive end of recorder assembly	37289	Switch—Plunger switch used in cutter base
37165	Center—Conical feed screw center—used on pivot end of recorder assembly	37305	Switch—Reject button switch—less plug
36906	Cutter—Recorder cutter head only	14609	Transformer—Input transformer
37167	Flange—Drive flange with three pins		
37169	Nut—Recorder head tension spring adjusting nut		
19721	Pinion—Feed screw drive pinion		
37164	Screw—Feed screw with gear		
37170	Screw—Recorder head spring adjusting screw		
19703	Screw—Yoke pivot screw and nut		
37166	Shaft—Drive pinion shaft only		
37173	Sleeve—Main base adjusting sleeve		
37168	Spring—Recorder head tension spring		
37172	Yoke—Main yoke with pin—less pivot screws		
MICROPHONE ASSEMBLIES			
32212	Adapter—Microphone to stand adapter		
MI-4036K	Microphone—Junior velocity microphone complete—less stand, adapter, and connection plug		
37244	Plug—3-prong microphone plug and shell		
20911	Ribbon—Replacement ribbon only for microphone		
MI-6232A	Stand—Microphone stand complete—less adapter, microphone and cord		
SPEAKER ASSEMBLIES (RL-76-B2) (RL-76-B3)			
14604	Coil—Neutralizing coil used in RL-76B2 only		
37311	Coil—900 ohm field coil for RL-76B2		
37312	Coil—3,000 ohm field coil for RL-76B3		
37310	Cone—Coil and voice coil assembly for either RL-76B2 or RL-76B3		
31539	Plug—5-prong male plug for RL-76B2		
11953	Plug—6-prong male plug for RL-76B3		
MISCELLANEOUS ASSEMBLIES			
37172	Base—Flanged cutter base with set screw		
37669	Bracket—Multiple lamp bracket		
37670	Bracket—Tuning tube clip bracket		
37267	Brush—Dust brush for recording		
30766	Cap—Magic Eye cap for function panel		
37262	Clamp—Spring steel retaining clamp for bottom of dial		
37263	Clamp—Spring steel retaining clamp for top of dial		
30716	Clip—"Magic Eye" mounting clip and thumb screw		
34285	Clip—Tuning tube clip and thumb screw		
37832	Connector—3-contact female socket as used on cutter and microphone cables		
12493	Connector—5-contact female connector for band indicator cable		
37264	Control—344 ohm and 250 ohm dual speaker control		
37320	Decalcomania—"Master Control" decal		
37323	Decalcomania—"Microphone" decal		
37319	Decalcomania—"Microphone Level" decal		
37324	Decalcomania—"Motor" decal		
36603	Decalcomania—"Power" decal		
37318	Decalcomania—"Radio" decal		
35392	Decalcomania—"RCA Victor" decal		
36386	Decalcomania—"RCA Victrola" trade mark decal		
37321	Decalcomania—"Recorder" decal		
37322	Decalcomania—"Reject" decal		
37326	Dial—Function indicator dial		
37325	Dial—Station selector dial		
37258	Frame—Dial frame—less plugs, "Magic Eye" clip, thumb screw, screen, and wooden lamp housing		
37884	Fuse—3 Ampere, 250 volt fuse		
37883	Fuse—5 Ampere, 250 volt fuse		
37824	Housing—Compartment lamp cast housing only—less switch socket and reflector		
37667	Housing—Function lamp housing only—less tube clip, brackets, switch, and cable		
		37259	Housing—Wooden band indicator lamp housing
		13103	Jewel—Pilot light jewel only
		37256	Knob—Large control knob and spring
		37257	Knob—Small control knob and spring
		11891	Lamp—6.3 volt