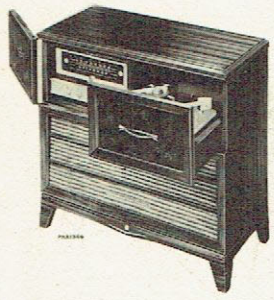


RCA VICTOR RADIO CO.,
445 PARK AVENUE
NEW YORK 22, N. Y.

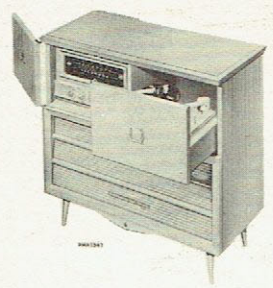


RCA VICTOR



Traditional
Mahogany or Maple

Modern
Light Oak



Model SHF-3 The "Mark III"

High-Fidelity Combination
MODEL SHF-3
Tuner/Amp. Chassis No. RC-1168B
Record Changer RP-205C-3
SERVICE DATA

— 1957 No. 13 —

PREPARED BY COMMERCIAL SERVICE
RCA SERVICE CO., INC.
CAMDEN 8, N. J.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR RADIO AND "VICTROLA" DIVISION

SPECIFICATIONS

- TUNING RANGE**
Standard Broadcast (AM) 540-1,600 kc.
Frequency Modulation (FM) 88-108 mc.
- INTERMEDIATE FREQUENCIES**
AM 455 kc. FM 10.7 mc.
- TUBE COMPLEMENT**
- (1) RCA 6CB6 R.F. Amplifier
 - (2) RCA 6X8 Mixer & Oscillator
 - (3) RCA 6BA6 I.F. Amplifier
 - (4) RCA 6AU6 2nd F.M. I.F. Ampl.
 - (5) RCA 6AU6 3rd F.M. I.F. Ampl.
 - (6) RCA 6AL5 Ratio Detector
 - (7) RCA 6AV6 A.M. Det.—AVC
 - (8) RCA 6AL7-GT Tuning Eye
 - (9) RCA 5Y3GT Rectifier
 - (10) RCA 6CG7 Two-Stage A.F. Ampl.
 - (11) RCA 6CG7 A.F. Amp. & Phase Splitter
 - (12) RCA 6V6GT Output
 - (13) RCA 6V6GT Output
- POWER SUPPLY RATING**
115 volts, 60 cycles, 135 watts (includes record changer)

- TUNING DRIVE RATIO** 7½:1 (3¼ turns of knob)
- RECORD CHANGER (RP-205C-3)**
Turntable speed 16⅔, 33⅓, 45 or 78 r.p.m.
Record capacity Up to fifteen 7 inch or
twelve 10 inch or
ten 12 inch or
ten 10 inch and 12 inch intermixed
- Pickup Stock No. 103422 Ceramic
Stylus Stock No. 103423 Dual synthetic sapphire
- AUDIO POWER OUTPUT**
12 watts With less than 2% distortion at 1000 cycles
15 watts Maximum
- FREQUENCY RESPONSE** 45 cycles to 20,000 cycles
- LOUDSPEAKERS**
Two 12" PM "woofers" 8 ohms @ 400 cycles
Two 3½" PM "tweeters" 6-8 ohms @ 3000 cycles
- CABINET DIMENSIONS**
Height, 34⅞" Width, 37¼" Depth, 16⅞"

DESCRIPTION

The "MARK III" is a high-fidelity combination instrument consisting of a tuner/amplifier, record changer and four speakers all in one cabinet.

The tuner/amplifier incorporates a tuned r.f. stage, mixer/oscillator, one stage of AM i.f. amplification and three stages of FM i.f. amplification. Audio amplification consists of three AF amplifier stages, phase splitter and push-pull output on all four functions. Inverse feed-back, applied to the third AF amplifier, is derived from a tapped resistive output load. The triode section of V7 (6AV6) provides amplified output to a tape recorder. This stage of amplification employs inverse feedback (R22 is used for both plate load and for feedback). The circuit is designed to enable tape recordings to be made from either radio programs or records. The program being recorded can be monitored on the speakers. A type 6AL7-GT tuning eye is used for accurate tuning on both AM and FM.

Two 12-inch wide-range speakers and two 3½-inch speakers are used for wide acoustic range and panoramic sound distribution.

The four-speed record changer, mounted in a roll-out drawer, utilizes a ceramic dual-stylus pickup.

Provision is made for use of this instrument as a companion amplifier/speaker unit in conjunction with tape recorder/sterotape player Model STR-2. When used for this purpose, the "MARK III" provides "right channel" amplification and speaker output equal to that of the "left channel" of Model STR-2. A two-pushbutton switch located above the tuning dial is used to select either radio, phono tape recording, standard tape playback operations ("MARK") or tape playback from Model STR-2 ("STEREO").

SUPPLEMENTARY INFORMATION

Issue	Subject
List related Supplements and Service Tips above.	

ALIGNMENT PROCEDURE

Alignment Sequence

Due to the use of separate I.F. transformers, there is little interaction between the 10.7 mc. and the 455 kc. adjustments.

There is a slight interaction of adjustments on the tuning condenser between AM and FM.

If a large amount of adjustment is required of any circuit, all others should be checked in the following order:

- FM I.F.
AM I.F.
AM Osc., ant. and r.f.
FM Osc., ant and r.f.

Final adjustment of AM ant. trimmer should be made with chassis and antenna in cabinet.

Alignment Indicators

For measuring the developed d-c voltage across R40 or R41 during FM alignment an RCA VoltOhmyst or an equivalent meter should be used.

The RCA VoltOhmyst can also be used to indicate audio output voltage across the voice coil or developed voltage on the AVC bus.

Signal Generator

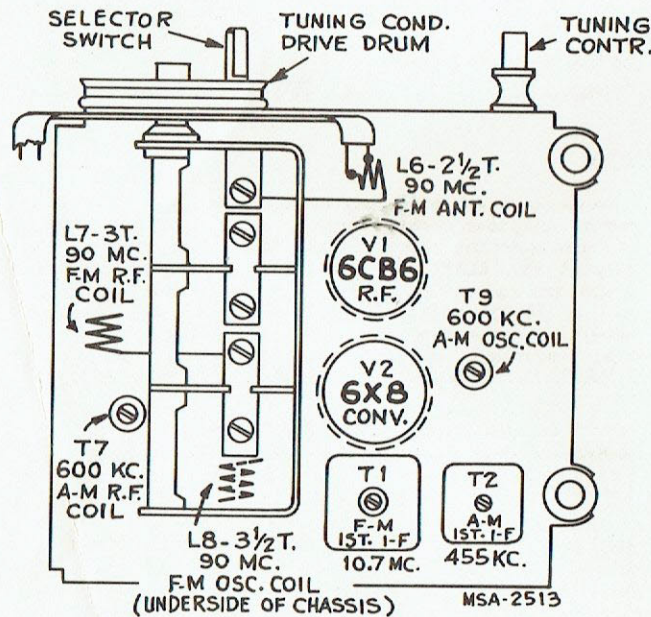
For alignment operations connect the low side of the signal generator to the receiver chassis. The output of the signal generator should always be controlled to prevent over-loading or excessive AVC action.

Oscilloscope Alignment

It is preferable to use a sweep generator and oscilloscope for aligning I.F. and R.F. circuits to obtain a visual observation of curve shape during alignment.

With FM sweep generator connected between FM ant. (#3) terminal and chassis, and oscilloscope connected between the junction of R37-C31 and chassis, the overall FM linearity may be observed. There should be a peak-to-peak separation of 250 kc. with 50,000 microvolts input.

For FM alignment of the ratio detector, connect oscilloscope to junction of R37-C31 as in alignment table, adjusting T6 top and bottom cores for 10.7 mc. crossover and balanced peaks. When aligning other FM tuned circuits, connect oscilloscope to pin #1 of V5 (3rd FM IF) and disconnect C26. Follow alignment table sequence, adjusting for maximum gain and symmetry.



FM Coil Locations

FM Alignment

RANGE SWITCH IN FM POSITION
VOLUME CONTROL MAXIMUM—TONE CONTROL CENTER

Table with 5 columns: Steps, Connect high side of sig. gen. to—, Sig. gen. output, Turn radio dial to—, Adjust for peak output. Contains 10 steps for FM alignment.

* Use ceramic disc capacitor with short leads.

†† Alternate loading may be necessary to provide accurate observation of peaks.

Alternate loading involves the use of a 270 ohm resistor to load the plate winding while the grid winding of the SAME TRANSFORMER is being peaked. Then the grid winding is loaded with the resistor while the plate winding is peaked. Only one winding is loaded at any one time. Remove the 270 ohm resistor after T3 and T1 have been aligned.

It is possible to run the IF transformer cores all the way through the coil winding and obtain a second peak. This will cause serious overcoupling and should be avoided by using a marked adjusting stick. The correct peak is always the first peak obtained when the core is started in from the "backed all the way out" position.

Incorrect peaking can seriously affect gain and bandwidth.

** Note: FM antenna, mixer and oscillator coils are adjustable by increasing or decreasing the spacing between turns. The location of the tap on the antenna coil is 3/8 turn to 1/4 turn from the ground end.

Oscillator frequency is above signal frequency on both AM and FM.

ALIGNMENT PROCEDURE—LEAD DRESS

AM Alignment

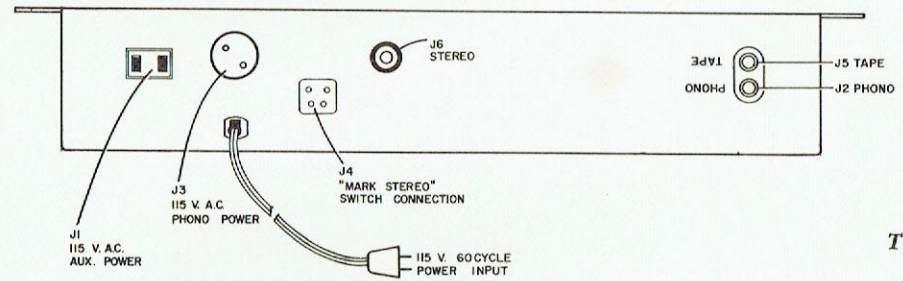
RANGE SWITCH IN AM POSITION

Table with 5 columns: Steps, Connect high side of sig. gen. to—, Sig. gen. output (400 cy. modulation), Turn radio dial to—, Adjust for peak output. Contains 8 steps for AM alignment.

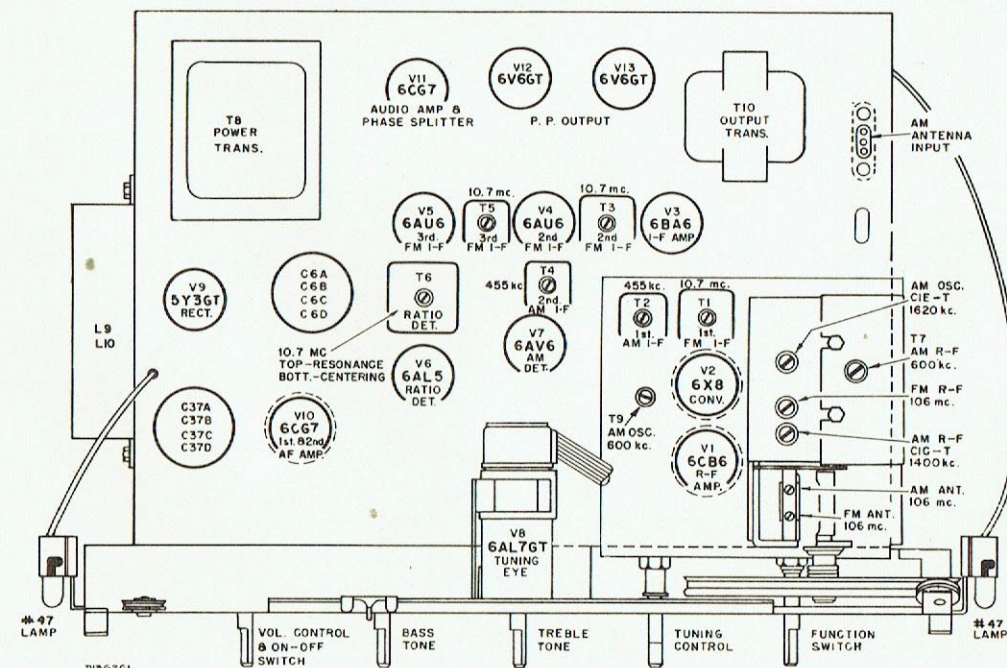
The RF transformer (T7) and the oscillator coil (T9) cores should be adjusted on the peak obtained with the core coming out the lug end of the coil. When adjusting from the top of the chassis, this is the peak with the core farthest into the coil.

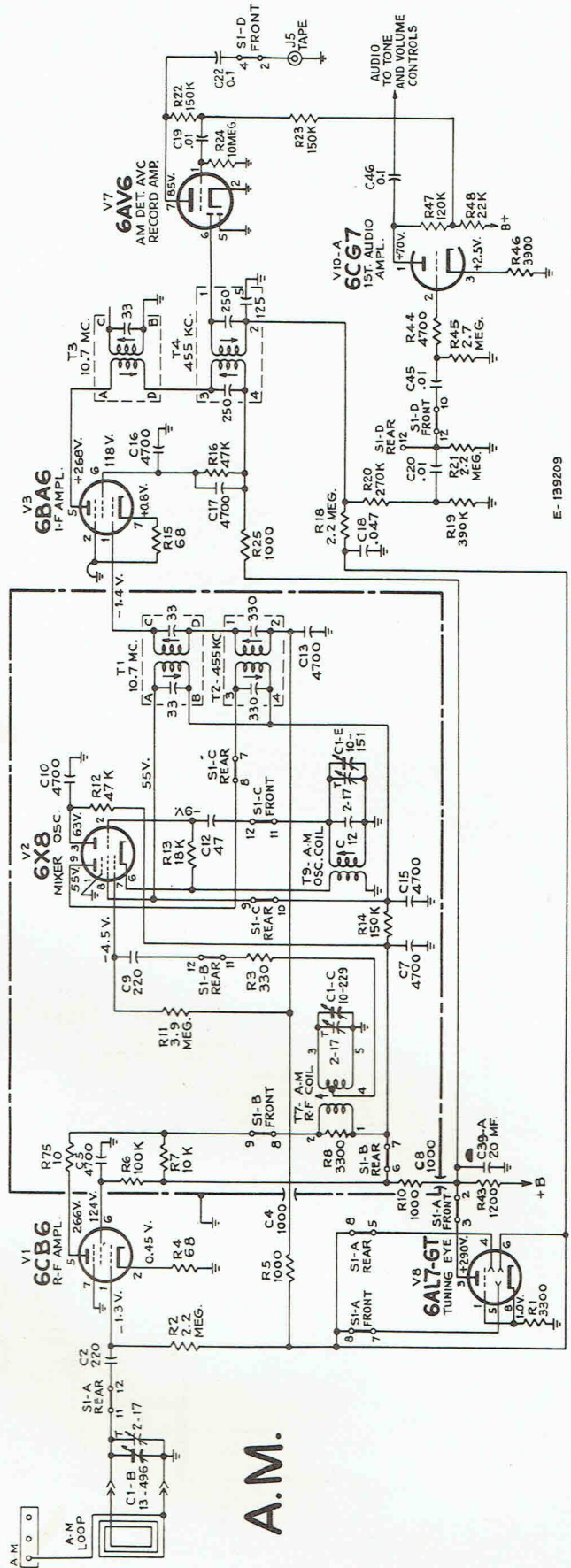
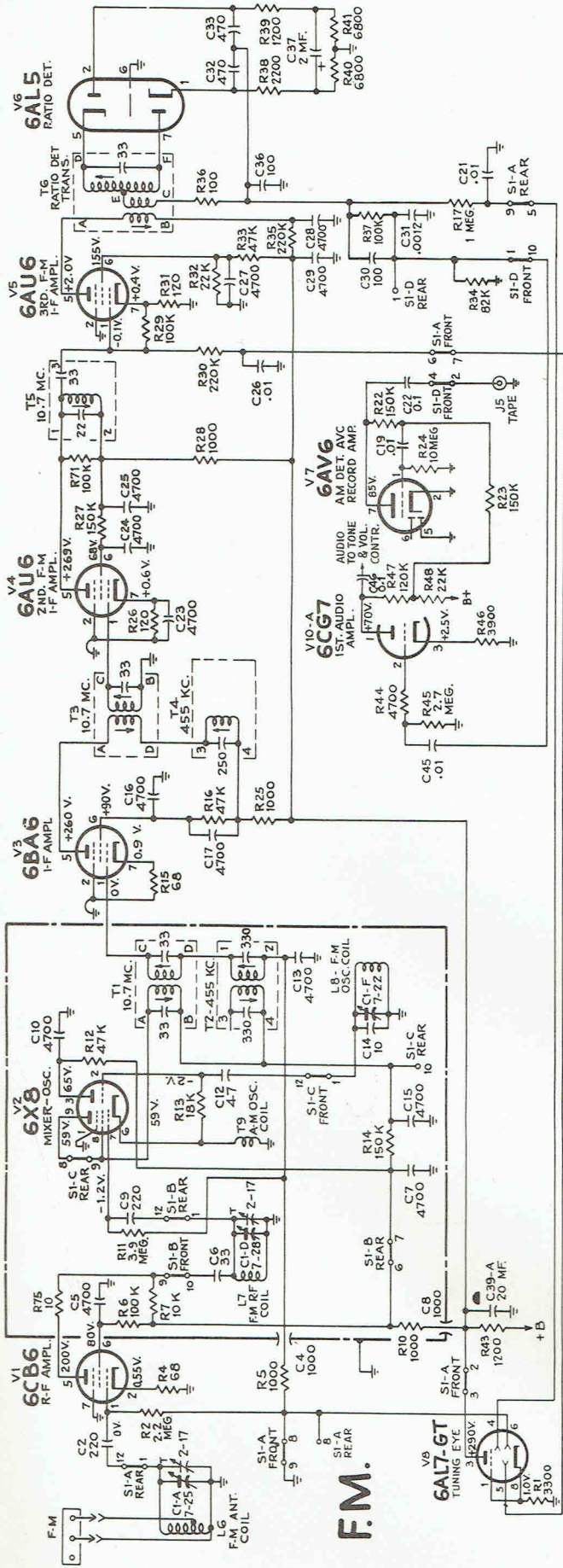
Critical Lead Dress

- 1. Dress R33, R42, R43 and R61 up in the air away from all other components.
2. Dress R44 and R45 down against chassis.
3. Keep leads of C30, C31 and C36 short and dress these components down against chassis.
4. Keep all I.F. bypass leads short.
5. Keep power line chokes up away from chassis.
6. Dress power line leads away from top tap of volume control.
7. Do not re-locate ground straps from chassis to R.F. shelf.
8. Lead from terminal "B" of 1st FM I.F. transformer to switch should be 3 inches ± 1/4".
9. Dress all components and wiring away from V1 grid circuit. Keep grid end lead of R2 short.
10. Dress pilot lamp lead away from phono input.
11. Replace all shields securely if it has been necessary to remove them.
12. Dress audio capacitors down against chassis where possible.
13. Dress power cord away from end bell of the power transformer.

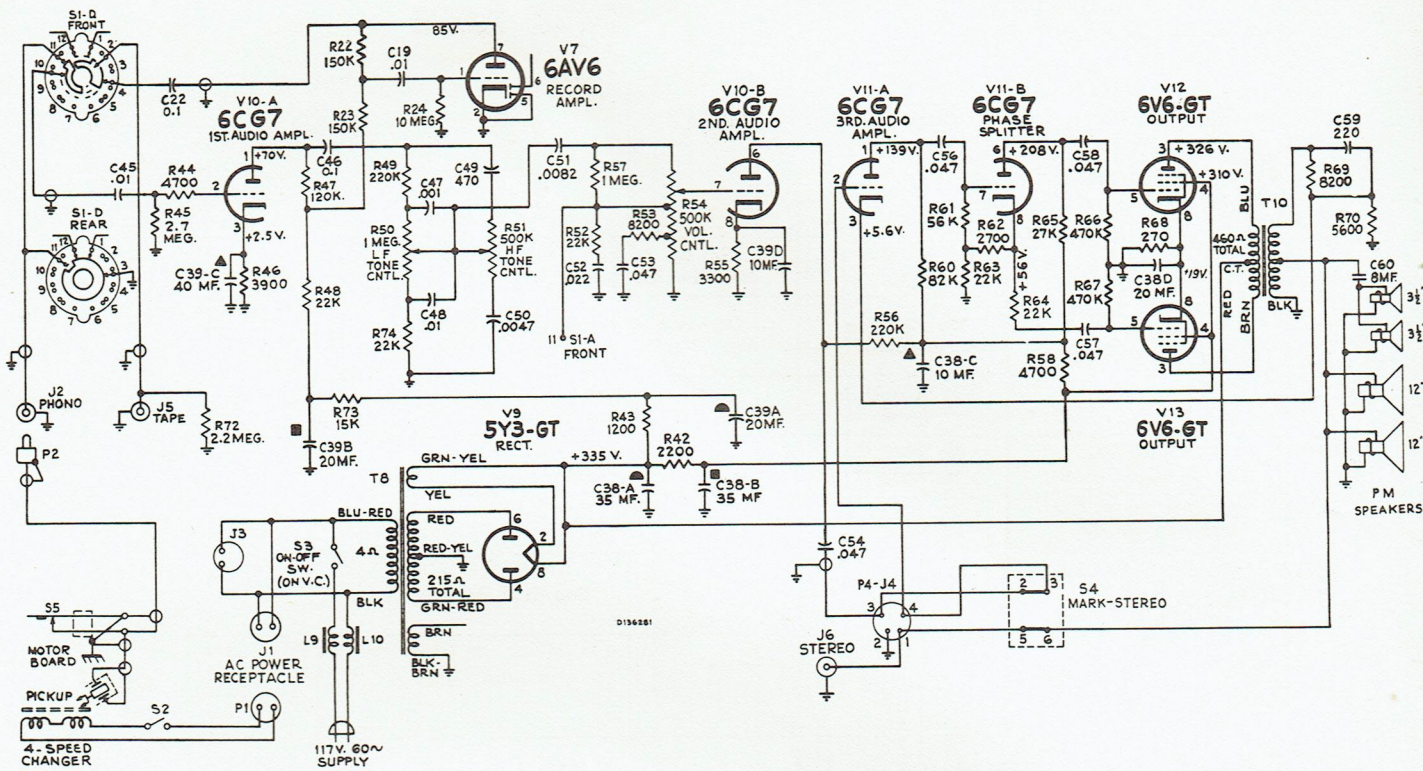


Tube and Trimmer Locations

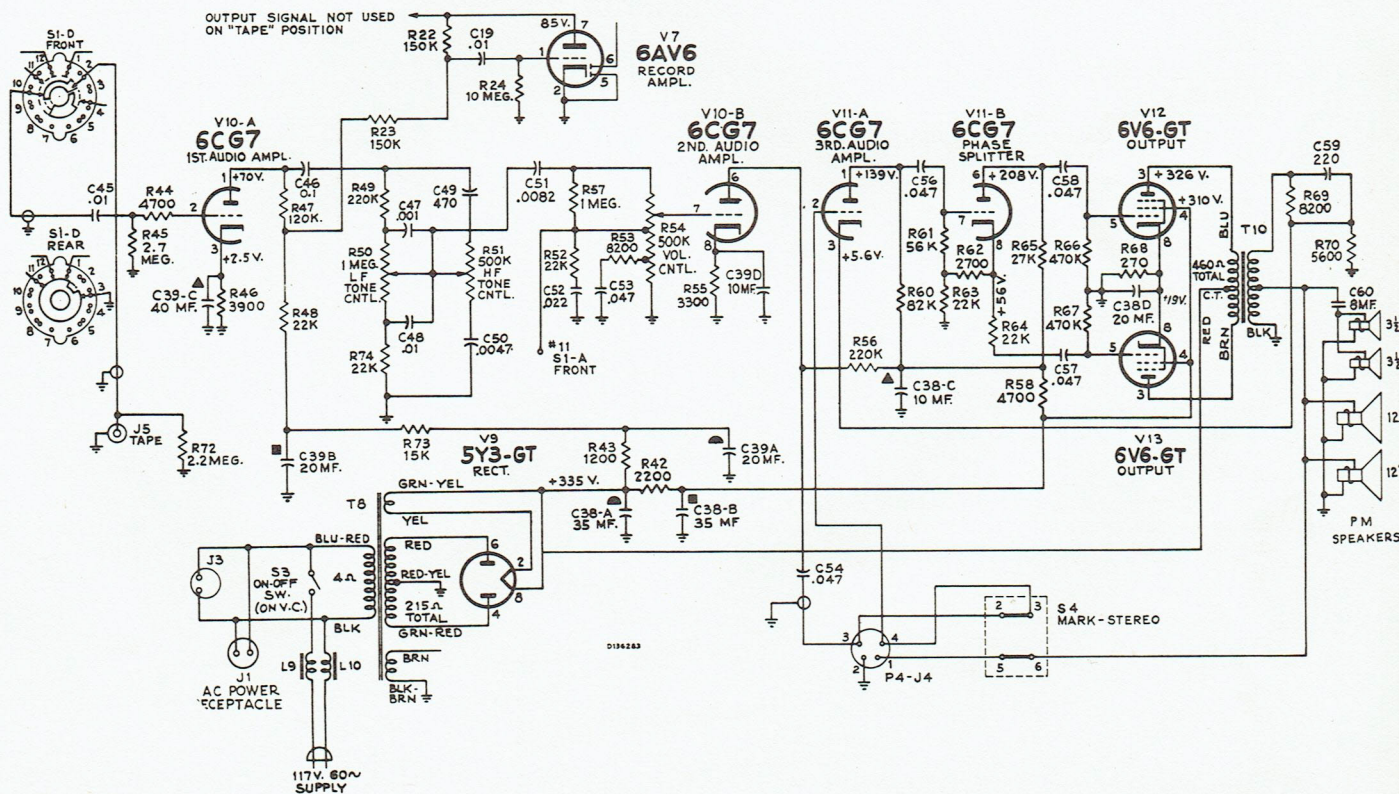




E-139209



Simplified Schematic Diagram — "Phono" Function



Simplified Schematic Diagram — "Tape" Function

MARK STEREO

ON-OFF LOUDNESS BASS TREBLE TUNING AM FM PH. TAPE

RADIO CONTROLS

	Pull out for "ON" Push in for "OFF"			
TO PLAY RECORDS	Set at desired level	Set for desired tone Use "MARK" pushbutton		PH
TO RECORD FROM PHONOGRAPH	No effect on recording†	No effect on recording Use "MARK" pushbutton		"
TO RECEIVE RADIO PROGRAMS	Set at desired level	Set for desired tone Use "MARK" pushbutton	Tune to desired station	AM or FM
TO RECORD RADIO PROGRAMS	No effect on recording†	No effect on recording Use "MARK" pushbutton	" "	" "
TO RECORD FROM MICROPHONE	" "	" " " "		TAPE
TO PLAY BACK TAPE FROM STANDARD TAPE RECORDER	Set at desired level	See Text Below		"
TO PLAY BACK TAPE (SINGLE TRACK OR STEREO) FROM MODEL STR-2	No effect	" " "		Any position

† Recording level is controlled only by tape recorder. LOUDNESS control on Model SHF-3 controls only monitoring loudness level.

The "TAPE" connection on Model SHF-3 is designed for use with tape recorders such as Models [] and []. One connecting cable serves both for tape recording and tape playback when connected to the "RADIO-PHONO" jack of these tape recorders. The "MARK" pushbutton must be depressed.

The "STEREO" connection on Model SHF-3 is designed

for use with a stereophonic tape player such as Model STR-2. This tape player has two interconnecting cables, the "TAPE" cable connects to the "TAPE" jack of Model SHF-3 and the "STEREO" cable connects to the "STEREO" jack of Model SHF-3. With this combination of instruments, standard tape recording is accomplished through the "TAPE" cable and with the "MARK" pushbutton depressed. Tape playback (either single track or stereophonic) is accomplished through the "STEREO" cable and with the "STEREO" pushbutton depressed.

RECORD CHANGER CONTROLS

The record changer has a dual control on the motorboard and a stylus selector control on the pickup arm. The metal lever of the dual control is the OFF-ON-REJECT control. Turning this lever to the center position energizes the motor and starts the turntable, when turned to the clockwise position it starts the mechanism into complete automatic operation. The mechanism will shut off automatically after the last record has been played but can be shut off manually by turning this lever counter-clockwise.

The circular knob of the dual control is the speed control. It has four positions: "16 2/3", "33", "45", "78", to select the turntable speed desired.

The stylus control has two positions; to change position, push the end of the control lever down and under.

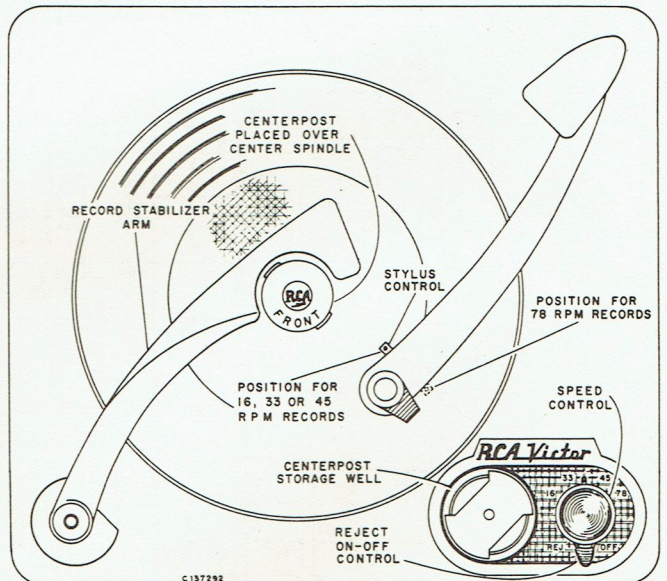
The removable centerpost is for use with 16 2/3 or 45 r.p.m. records having the large centerhole. It must be placed over the center spindle with the word "FRONT" FACING to the FRONT. Care should be exercised in inserting and removing the centerpost so as to prevent damage to smaller spindle.

A well is provided on the record changer for storage of the centerpost when not in use. Projections on the sides of the well enable the centerpost to be secured by pressing down on the centerpost until a slight click is heard. It may be necessary to twist slightly while pressing down.

To load or remove records, lift and turn the record stabilizer arm off to the side. After loading, the stabilizer arm should be turned to the center so it rests on the stack of records.

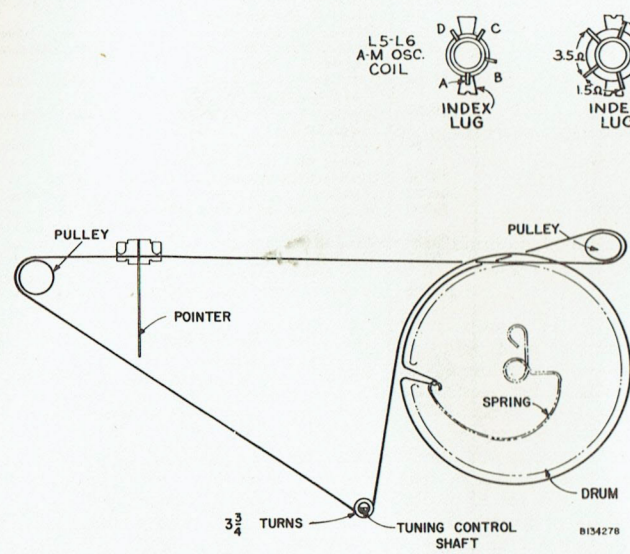
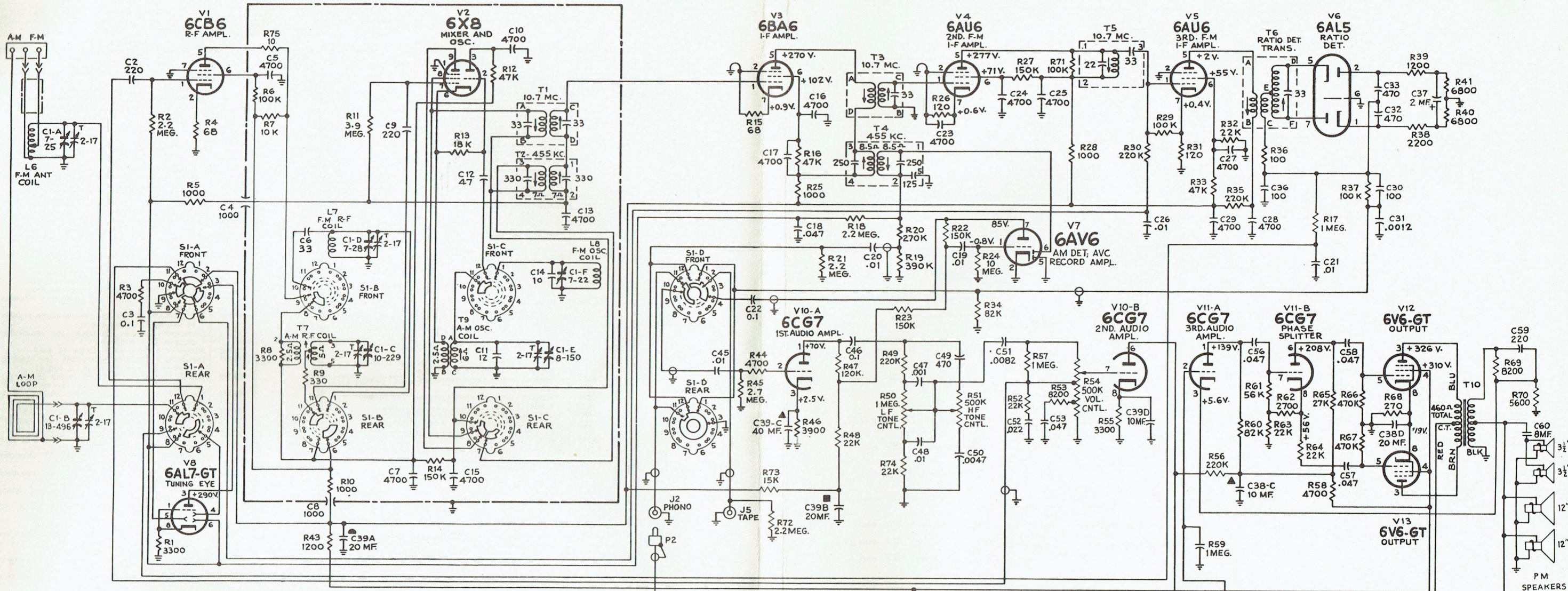
STYLUS REPLACEMENT

The dual stylus is held in position by a spring clamp. To remove, simply hold pickup sideways and pull spring clamp away from stylus and allow stylus to drop out. When inserting stylus, be certain that the small diameter rod holding the styli rests in the notch of the drive arm connecting to the cartridge element.

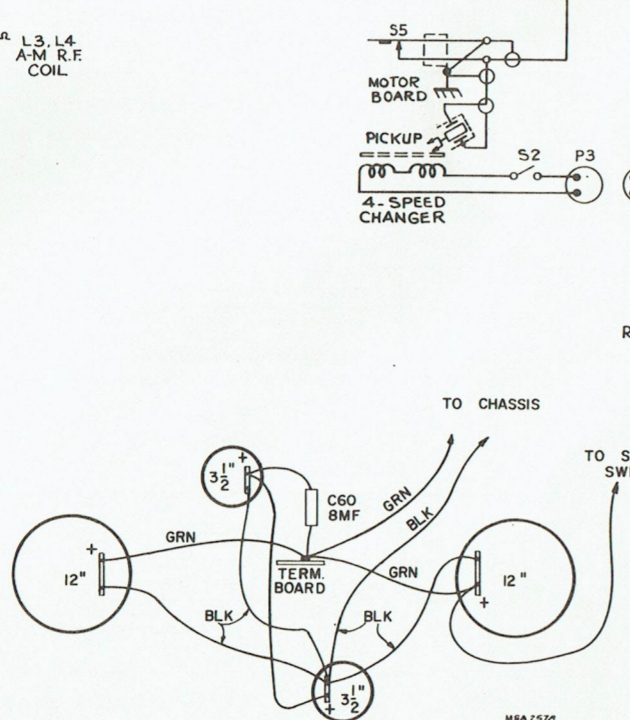


Record Changer Controls

FOR SERVICE INFORMATION — REFER TO "RP-205 SERIES SERVICE DATA" AND TO "RP-205 SERIES SERVICE DATA SUPPLEMENT"



TUNING DRIVE CORD ASSEMBLY SHOWN WITH GANG IN CLOSED POSITION
Dial Cord and Drive Assembly



Speaker Wiring Assembly

FUNCTION SWITCH S1 FRONT AND REAR SECTIONS VIEWED FROM FRONT AND SHOWN IN POS. NO.1 (MAX. COUNTER-CLOCKWISE)
 POS. 1 - PHONO. 16 2/3, 33 1/3, 45, 78 R.P.M.
 2 - A.M. RADIO.
 3 - F.M. RADIO.
 4 - TAPE.

RESISTANCE VALUES IN OHMS. K=1000.
 CAPACITANCE VALUES LESS THAN 1 IN MF, 1 AND ABOVE IN MMF. UNLESS OTHERWISE NOTED.

VOLTAGES MEASURED WITH "VOLTOHMYST" WITH FUNCTION SW. IN PHONO. OR TAPE POS. AND SHOULD HOLD WITHIN ± 20% WITH 117 V. A.C. SUPPLY.

DIRECTION OF ARROWS AT CONTROLS INDICATES CLOCKWISE ROTATION.

The heater voltage of the mixer/oscillator tube (6X8) is approx. 0.4 volt lower than other tubes. This is due to the filament choke coils L4 and L5.

Complete Schematic Diagram — Tuner/Amplifier Chassis & Record Changer

