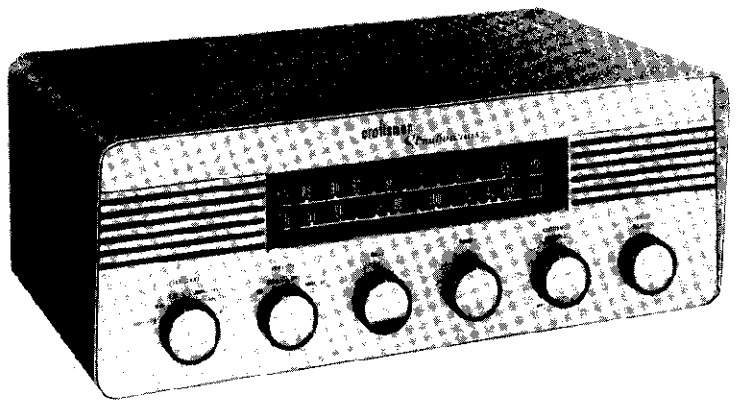


# craftsmen

MODEL CTA-5



## THE STRADIVARIUS AM-FM TUNER-AMPLIFIER INSTALLATION, OPERATION & SERVICE

**UNPACKING:** Unpack the instrument carefully and inspect the contents. If there is evidence of any damage which might have occurred in shipment, immediately call the transportation company who delivered it. Save all packing materials for inspection by their claims agent, who will also give you instructions for filing a claim. If you obtained your Stradivarius at your dealer's place of business, immediately notify him of the damage.

Included with your CTA-5 Stradivarius should be the following:

- Warranty Registration Card
- Instruction Booklet
- Cabinet Mounting Template
- 4 Chassis Mounting Screws
- 4 Washers
- 1 Audio Cable

To insure proper service according to the warranty, should this become necessary, be sure to fill in the Warranty Registration Card, and mail the postage prepaid portion to the factory.

**INSTALLATION:** Because of its attractive appearance, the Stradivarius is often simply placed in a convenient location, such as an end table or bookshelf. If cabinet or other built-in installation is desired, follow the detailed instructions given on the mounting template which is packed with the tuner.

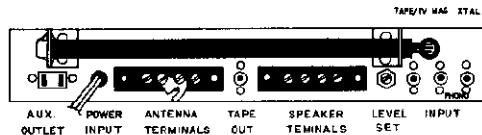


FIGURE 1  
CHASSIS REAR VIEW

# RADIO craftsmen

division of: PRECISION RADIATION INSTRUMENTS, INC.  
4223 West Jefferson Boulevard, Los Angeles 16, California

**POWER CONNECTIONS:** An auxiliary electrical outlet is provided on the rear of the chassis. Another component of your high fidelity system, such as the record player, may be plugged into this outlet, and the power switch of the Stradivarius will then turn both units off and on. If excessive hum is noticed in your high fidelity system, improvement may sometimes be gained by reversing the plugs of the power cords in the electrical outlets. This should be done with each unit in turn, including the record player. Hum, and sometimes crackling noises, in high fidelity systems often arise because of incomplete grounding of various parts of the record player. It may be helpful to connect a wire from the ground connection of the motor frame to the point where the shield braid of the phono cable connects to the cartridge wires.

**ANTENNA CONNECTIONS:** The built-in antennas in your Stradivarius are sufficient for excellent reception in almost all locations for both AM and FM. In areas of difficult reception, outdoor antennas may be required. Connections should be made as shown in Figure 2.

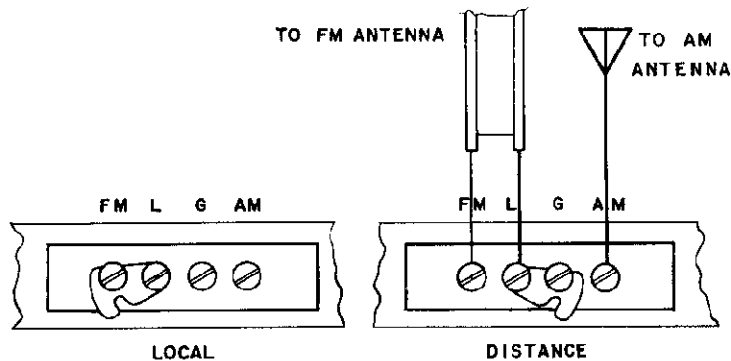


FIGURE 2  
CTA-5 ANTENNA CONNECTIONS

For AM reception in remote areas, the AM antenna should be a single insulated wire as long as is practical. It should be routed as far as possible from power lines, large metal objects, or any static-producing electrical equipment.

**PHONO CONNECTIONS:** Record players having magnetic cartridge should be plugged into the Stradivarius input jack marked MAG. The input jack marked XTAL is for crystal or ceramic cartridges.

**SPEAKER CONNECTIONS:** The speaker connections are the screw terminals marked G, 4, 8 and 16. Any ordinary insulated wire, such as parallel lamp cord, is suitable for hooking up speakers. Connect one side of the speaker to the terminal marked G and the other side of the speaker to the terminal corresponding to the nominal impedance of the speaker. For example, a 4-ohm speaker would be connected to the G and 4 terminals, an 8-ohm speaker to the G and 8 terminals, and so on.

You can use more than one speaker with your Stradivarius. If the speakers are of the same impedance, connect them all to the same set of terminals. To determine the proper impedance of the combination, divide the nominal impedance of the speakers by the number of speakers. For example, two 16-ohm speakers should both be connected to the G and 8 terminals (16 divided by two is 8). For connecting complex multiple speaker systems, seek the advice of the sound specialist at your Craftsmen dealer's or of a competent radio technician.

**TV CONNECTIONS:** The sound from your television receiver may be fed into the TAPE/TV input jacks of the Stradivarius. If your TV set does not have an output connection from its sound detector circuit, any qualified TV service technician can install one at nominal cost.

**TONE CONTROLS:** When the TREBLE and BASS controls are turned so that the indicator dots on the knobs are adjacent to the red dots on the panel, the audio circuits are adjusted for "flat" response. Because of the infinite variations which may be encountered in loudspeaker, cabinet, and room characteristics, flat response seldom provides the most pleasing sound. The treble and bass controls should be adjusted to suit the listener while the volume is set at the usual listening level.

When setting the controls on your equipment, it is of course always wise to follow the instructions of the manufacturer . . . But remember that Hi Fi equipment is like an excellent camera. It is capable of exact reproduction when desired but very often the most pleasing camera portraits have been retouched, parts of the picture highlighted, and others defocused or softened.

Similarly, the most pleasing recorded music often has been retouched. It is sometimes necessary for the record companies to vary the relative emphasis of highs and lows while recording a particular piece. Thus, after following the recommendations on how to adjust your system for flat response (which implies most accurate reproduction) remember that the greatest listening pleasure is what you are searching for. By trying the various tone controls and equalization positions decide for yourself what you like best. Often, the adjustment of a high fidelity system which makes a symphony sound best may not result in the best reproduction of speech, and vice-versa.

**FUNCTION SWITCH:** The FUNCTION switch controls the input of the Stradivarius, and in addition provides a choice of three low frequency record equalization curves. Starting at the extreme left, the first position of the FUNCTION switch selects the TAPE/TV input. The second position selects AM radio, and the third position selects FM radio.

The last three positions are all for phono, but each provides a different equalization curve for the low frequencies.

The process of imprinting sound on records requires that the high frequencies be exaggerated and the low frequency sounds be de-emphasized. Therefore, the sound as it is impressed in the grooves of the record has been changed from the original. These changes must be compensated for, or "equalized," in the reproducing system.

The situation is further complicated by the fact that various recording companies use somewhat different techniques, producing records for which different equalization is needed if they are to sound like the original when played back.

The many equalization choices available in the Stradivarius compensate for the recording "curves" of practically every brand of record.

**ROLL-OFF SWITCH:** The ROLL-OFF switch allows selection of the various record equalization curves for the high frequencies. As this switch is rotated in a clockwise direction it progressively reduces the response in the high frequency range.

When the FUNCTION switch is in either the TAPE/TV, the AM or the FM position, the ROLL-OFF switch has no effect.

The following is a guide for choosing the proper equalization setting:

**LP:** Some European LP's, and most American LP's made prior to 1954. Some of the brands are Boston, Columbia, Decca, Epic, Haydn Society, Oceanic, Urania, Vanguard-Bach Guild.

**RIAA:** Most American records made since 1954; also the following brands made prior to 1954; Angel, Atlantic, American Recording Society, Capitol, Cook, Esoteric, MGM, Polymusic, RCA Victor, Remington, Tempo, Westminster.

**ffrr:** London Records, long playing.

**BR:** Some European 78 r.p.m. records.

**AES:** Some American records made since 1954.

As shown on the FUNCTION and ROLL-OFF switch designations, in some cases either the low frequency or the high frequency end of two equalization curves may be the same, while the other ends of the curves may be different. Less commonly used equalization curves may be obtained by various settings of the two switches even though the indicator dots on the knobs are not set to the same designations.

If you do not have information on how a particular record was cut, simply select the equalization setting which sounds best to you. Now most American companies use the RIAA recording curve.

**CONTOURED LOUDNESS AND LEVEL SET:** The frequency response of the human ear is not the same at loud volume levels as it is at soft levels. To preserve real high fidelity effects at different levels of loudness, it is necessary to provide a means of compensating for the change in the tonal perception of the ear. The combination of the LEVEL SET control (on the rear of the Stradivarius chassis) and CONTOURED LOUDNESS control does this automatically.

It is rarely necessary to adjust the LEVEL SET control after the Stradivarius is first put into operation. To adjust the LEVEL SET, turn the CONTOURED LOUDNESS control fully clockwise (in this position there is no compensation effect). Put on a phonograph record, and turn up the LEVEL SET control until the sound is at the loudest volume you will ever expect to use.

The CONTOURED LOUDNESS control will now control the loudness, or volume, and will automatically provide the proper frequency compensation for any volume level.

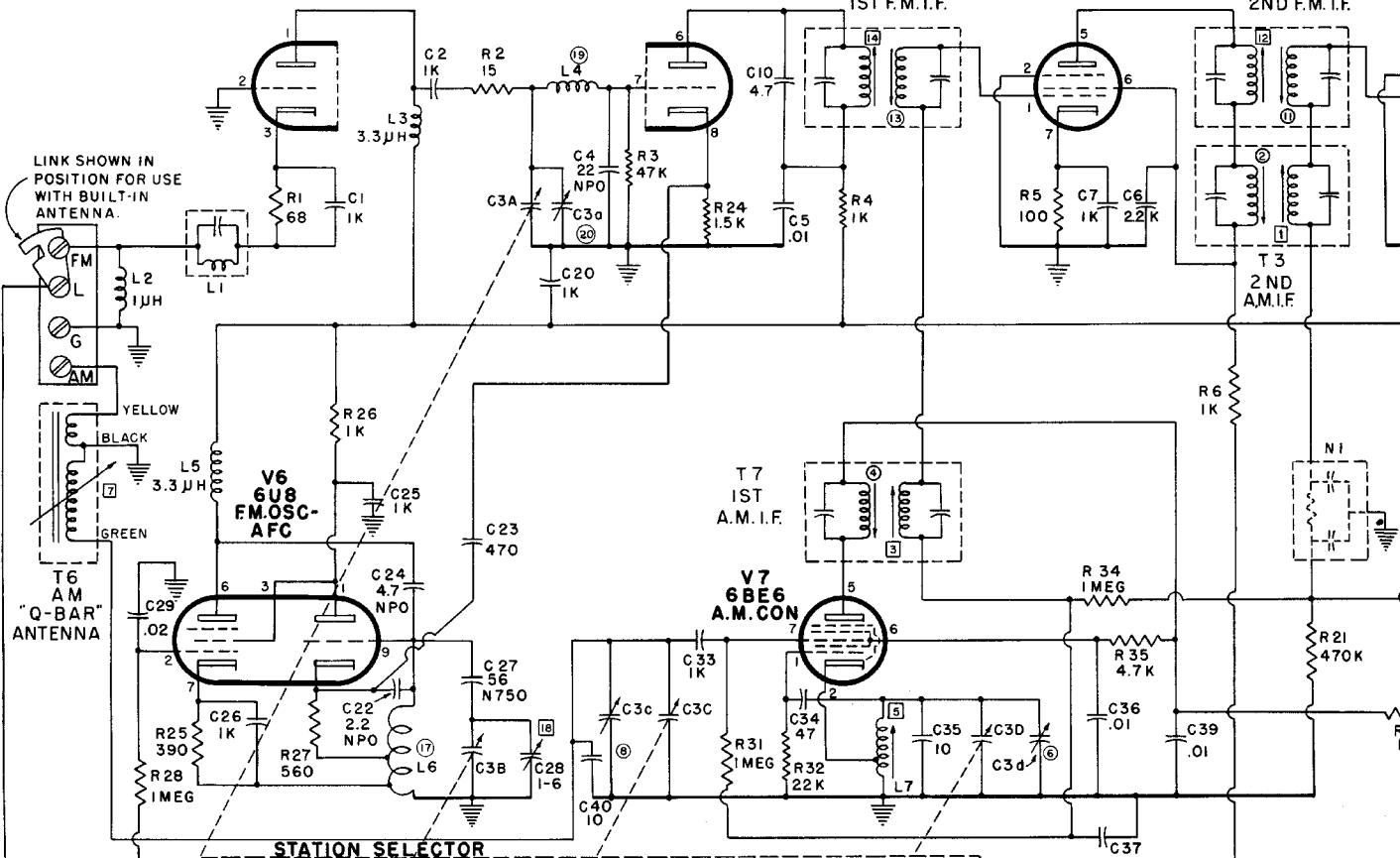
If you do not have a record player in your high fidelity system, tune in a nearby radio station and follow the same procedure.

VIA  
1/2 6BQ7A  
F.M.R.F. AMP

VIB  
1/2 6BQ7A  
F.M. MIXER

V2  
6BA6  
I.F. AMP

T2  
2ND F.M.I.F.

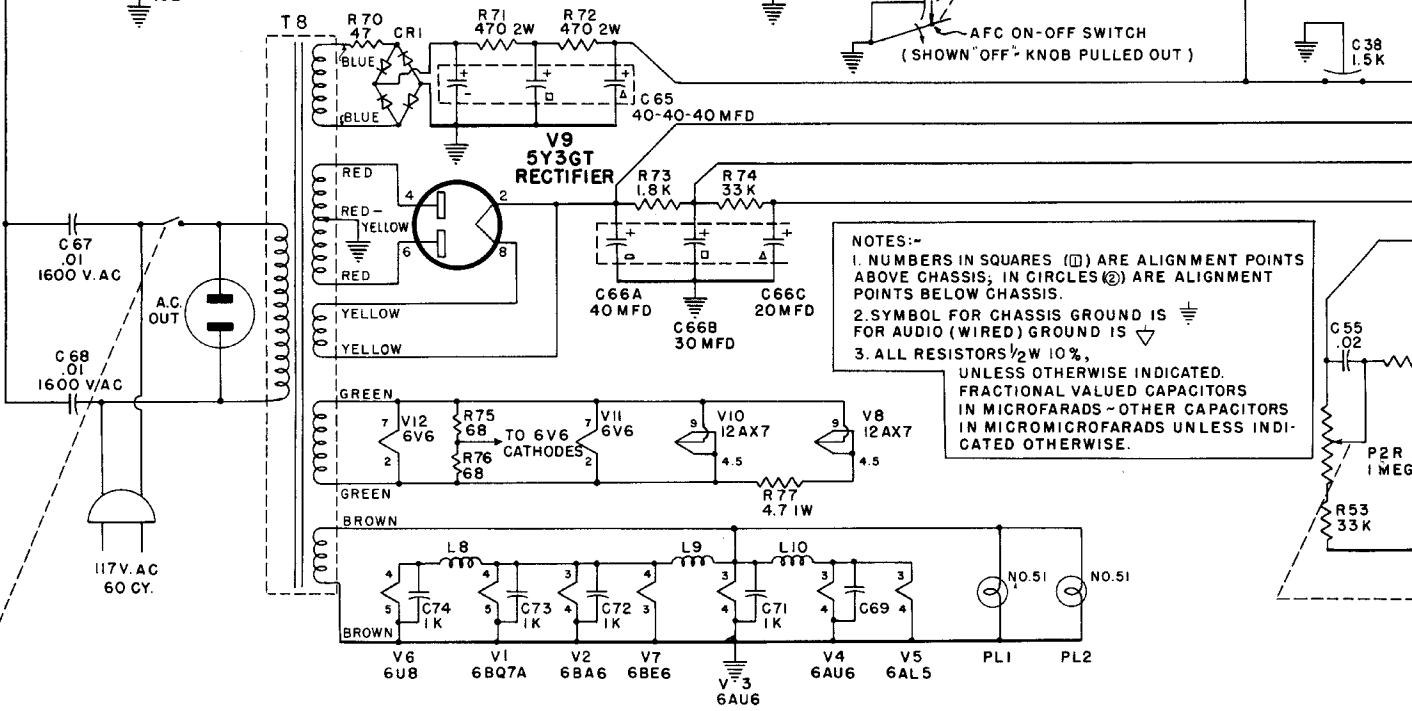


LINK SHOWN IN POSITION FOR USE WITH BUILT-IN ANTENNA.

T6 AM "Q-BAR" ANTENNA

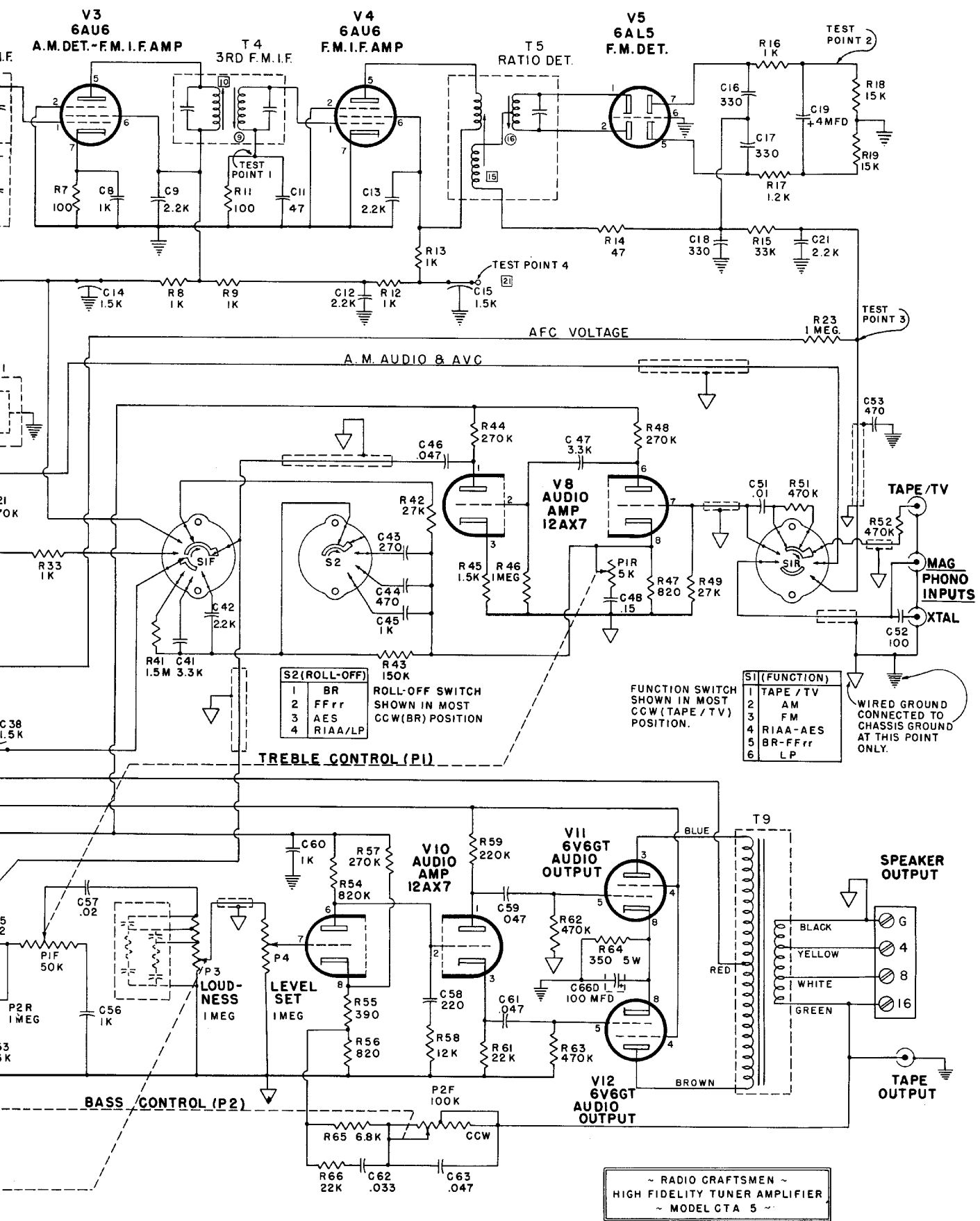
STATION SELECTOR

AFC ON-OFF SWITCH (SHOWN "OFF" - KNOB PULLED OUT)



NOTES:-  
1. NUMBERS IN SQUARES (□) ARE ALIGNMENT POINTS ABOVE CHASSIS; IN CIRCLES (⊙) ARE ALIGNMENT POINTS BELOW CHASSIS.  
2. SYMBOL FOR CHASSIS GROUND IS  $\perp$  FOR AUDIO (WIRED) GROUND IS  $\nabla$   
3. ALL RESISTORS 1/2 W 10%, UNLESS OTHERWISE INDICATED. FRACTIONAL VALUED CAPACITORS IN MICROFARADS - OTHER CAPACITORS IN MICROMICROFARADS UNLESS INDICATED OTHERWISE.

V6 6U8  
V1 6BQ7A  
V2 6BA6  
V7 6BE6  
V3 6AU6  
V4 6AU6  
V5 6AL5  
PL1  
PL2



**S2 (ROLL-OFF)**

1	BR
2	FFrr
3	AES
4	RIAA/LP

ROLL-OFF SWITCH SHOWN IN MOST CCW (BR) POSITION

**S1 (FUNCTION)**

1	TAPE / TV
2	AM
3	FM
4	RIAA-AES
5	BR-FFrr
6	LP

FUNCTION SWITCH SHOWN IN MOST CCW (TAPE / TV) POSITION.

WIRED GROUND CONNECTED TO CHASSIS GROUND AT THIS POINT ONLY.

~ RADIO CRAFTSMEN ~  
HIGH FIDELITY TUNER AMPLIFIER  
~ MODEL CTA 5 ~

**TAPE INPUT:** The TAPE/TV input may be used with a tape player which has its own pre-amplifier. When the TAPE/TV input is being used, the BASS and TREBLE tone controls and the CONTOURED LOUDNESS control of Stradivarius all function. If your tape player has tone controls, you may set these for flat response and control tone with the Stradivarius tone controls. Alternatively, you may set the BASS and TREBLE controls of the Stradivarius for flat response and control the tone with the tape player controls.

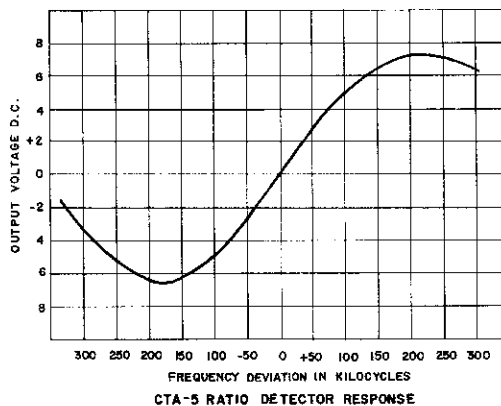
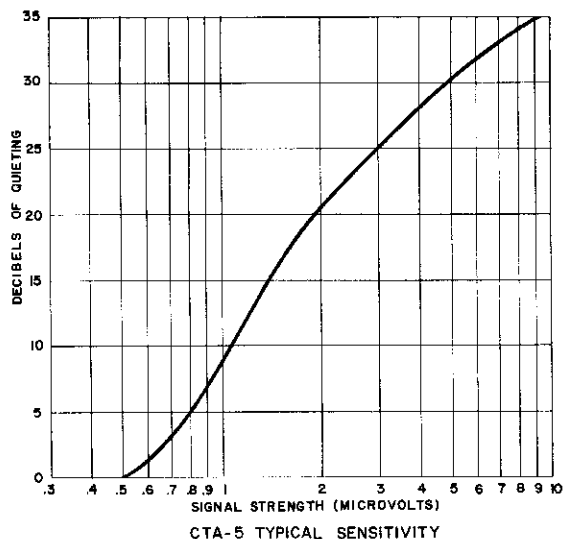
**TAPE OUTPUT:** The TAPE output of the Stradivarius is designed to feed a tape recorder amplifier. The signal at the TAPE output is exactly the same as at the speaker output; therefore, a speaker attached to the Stradivarius monitors the sound being fed to the tape recorder. The controls of the Stradivarius should be adjusted for the most pleasing sound when the recording is made. Then, when playing the tape recording, if the Stradivarius controls are set for flat response, the sound will be reproduced exactly as it was recorded. It is recommended that when making tape recordings, the Stradivarius Contoured Loudness Control be inoperative, that is, rotated to its maximum clockwise position. The Level Set Control should then be used to adjust volume. Further adjustment of recording level then may be made with the volume control of the tape recorder.

**AUTOMATIC FREQUENCY CONTROL:** Automatic Frequency Control (AFC), is an electronic means of keeping the receiver properly tuned to the FM broadcasting station. Even if one should not tune to the exact center of the channel manually, the AFC will automatically "pull in" to the proper point. However, in tuning in a weak station adjacent to a stronger one, if the AFC is operating it may "lock" on the stronger signal. It is therefore desirable to have a means of disabling the AFC. This is easily accomplished on the Stradivarius by simply pulling out on the

STATION SELECTOR knob; pushing this knob in towards the panel restores the AFC action. In general, when tuning an FM station, one should use the AFC. In this condition, it will be noticed that the stations tune quite broadly; that is, a station will cover a relatively long space on the dial. This is because the AFC is locking on the signal when the dial pointer is still some distance on either side of the channel center.

For very precise tuning, especially for weak stations which are adjacent to stronger ones, one may disable the AFC. Once the station is accurately tuned in, restore the AFC. It will then not be possible for the tuning to "drift".

An interesting experiment to demonstrate AFC operation is to slightly mistune a station with the AFC off; then turn on the AFC and notice how the station is immediately brought into proper adjustment.



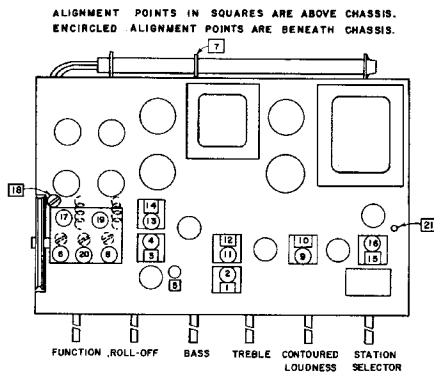
# SERVICE INSTRUCTIONS

**ALIGNMENT PROCEDURE:** To set pointer, completely mesh tuning capacitor and align pointer with end of dial base line at low frequency end of dial. Loudness control should be in maximum clockwise position. Output of signal generator should be no higher than necessary to obtain an output reading. Low side of signal generator and indicating meter should be connected directly to chassis at all times. Use an insulated screwdriver with  $\frac{1}{8}$ " thick blade for adjusting IF transformers.

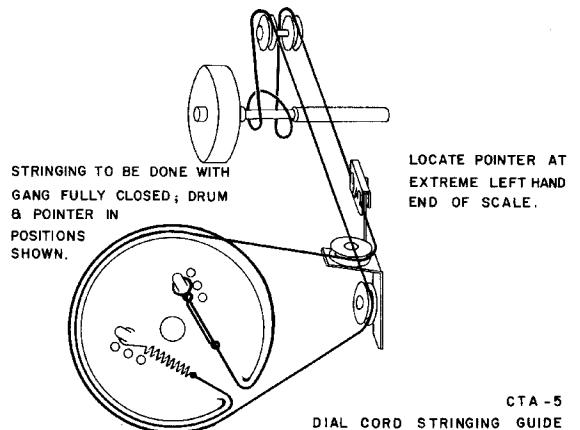
	SIGNAL GENERATOR			Dial Setting	Indicating Meter	Adjust	Indication	
	Coupling	Freq.	Modulation					
AM ALIGNMENT	1	.01 mf to pin 7 6BE6 (V7)	455 kc	CW	Point of no interference	Neg D.C. VTVM AVC line	1,2,3,4	Maximum Deflection
	2	220 mmf to AM input	600 kc	CW	600 kc	Same as above	5	Maximum Deflection
	3	Same as above	1500 kc	CW	1500 kc	Same as above	6	Maximum Deflection
	4	Repeat Steps 2 & 3 (as required)						
	5	Same as above	600 kc	CW	600 kc	Same as above	7	Maximum Deflection
	6	Same as above	1500 kc	CW	1500 kc	Same as above	8	Maximum Deflection
	7	Repeat Steps 5 & 6 (as required)						
FM ALIGNMENT (AFC OFF)	8	100 mmf to pin 7, 6BQ7A (V1B)	21.7 mc	CW	Point of no interference	Neg. D.C. VTVM Test Pt. (1)	9,10,11,12, 13,14	Maximum Deflection
	9	Same as above	21.7 mc	CW	Same as above	Neg. D.C. VTVM Test Pt. (2)	15	Maximum Deflection
	10	Same as above	21.7 mc	CW	Same as above	Zero-center D.C. VTVM Test Pt. (3)	16	Zero volts—between positive & negative readings
	11	270 ohm composition resistor to FM antenna input	90 mc	FM ± 250 kc sweep width	90 mc	Vertical input of oscilloscope thru 0.1 mfd to Test Pt. (4)	Contract or extend L6 (17)	Center band-pass curve on oscilloscope sweep
	12	Same as above	106 mc	Same as above	106 mc	Same as above	18	Center band-pass curve on oscilloscope sweep
	13	Repeat Steps 11 & 12 (as required)						
	14	Same as above	90 mc	Same as above	90 mc	Same as above	Contract or extend L4 (19)	Maximum amplitude of band-pass curve on oscilloscope
	15	Same as above	106 mc	Same as above	106 mc	Same as above	20	Maximum amplitude of band-pass curve on oscilloscope
	16	Repeat Steps 14 & 15 (as required)						
	17	Same as above	98 mc	Same as above	Tune to Center Curve on scope	Vertical input of oscilloscope to TAPE OUTPUT	Tone Controls "Flat"	Check symmetry of "S" shape

All measurements at 115V AC line, no signal applied, no antenna.  
 All voltages are D.C.; measured with vacuum-tube voltmeter to chassis ground; function switch in F.M. position; unless otherwise noted.  
 \*A.C. voltages at 1000 ohms per volt.  
 1DNM—Do not measure. A probe at this point will usually cause the i-f strip to oscillate.  
 2FUNCTION Switch in A.M. position.  
 3A.C. voltages at 1000 ohms per volt, measured across tube filaments, not to chassis ground.  
 4Used as tie-point.  
 5Cathode-to-grid.

Tube	Ref. No.	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
6BQ7A	V1	96	0	0.75	6.3*	0	94	0	2.7	0
6BA6	V2	0	0	6.3*	0	85	85	1.2	—	—
6AU6	V3	0	0	6.3*	0	85	85	0.65	—	—
6AU6	V4	-0.3	0	6.3*	0	DNM <sup>1</sup>	66	0	—	—
6AL5	V5	DNM <sup>1</sup>	DNM <sup>1</sup>	6.3*	0	0.9	0	-0.9	—	—
6UB	V6	90	-0.50	90	6.3*	0	96	1.4	2.3	0
6BE6	V7	-11 <sup>2</sup>	0	0	6.3*	125 <sup>3</sup>	92 <sup>2</sup>	-0.56 <sup>2</sup>	—	—
12AX7	V8	112	0	0.63	21	21	90	0	.42	4.4 <sup>4</sup>
5Y3GT	V9	—	310	—	250*	—	250*	—	5.0 <sup>5</sup>	—
12AX7	V10	203	90	1.0 <sup>5</sup>	21	21	90	0	1.1	6.3 <sup>3</sup>
6V6GT	V11	—	21	304	295	0	96*	6.3 <sup>3</sup>	21	—
6V6GT	V12	—	21	304	295	0	—	6.3 <sup>3</sup>	21	—



CTA-5 CHASSIS TOP VIEW



CTA-5  
 DIAL CORD STRINGING GUIDE

# FACTORY REPLACEMENT PARTS LIST

## CAPACITORS

Part Number	Reference Number	Description
CAX-6	C3	4-Section Tuning Gang
CBX-1	C14, 15, 32, 38	1500 mmf Feed-Through
CKX-1	C28	1-6 mmf Trimmer
CEX-11	C65	40-40-40 mf, 150 V Twist-Mount Electrolytic
CEX-10	C66	40-30-20-10 mf, Twist-Mount Electrolytic
CCX-1	N1	Printed Detector Network

## COILS, CHOKES & TRANSFORMERS

T-40	L1	21.7 Mc Resonant Choke
53A043	L2	1 Microhenry choke
53A046	L3, L5	3.3 Microhenry choke
T-36	L4	FM RF Coil
T-37	L6	FM OSC Coil
T-38	L7	AM OSC Coil
53A051	L8, 9, 10	Filament Choke
T-31	T1, 2, 4	FM IF Transformer 21.7 Mc
T-34	T3	AM Detector Transformer - 455Kc
T-32	T5	Ratio Detector Transformer - 21.7 Mc
T-35	T6	"Q-Bar" Ferrite AM Antenna
T-33	T7	AM Converter Transformer - 455 Kc
T-28	T8	Power Transformer
T-27	T9	Output Transformer

## POTENTIOMETERS & SWITCHES

P-25	P1	Potentiometer, Dual TREBLE Control
P-24	P2	Potentiometer, Dual BASS Control
P-26	P3	Potentiometer, LOUDNESS CONTROL with Switch
P-11	P4	Potentiometer, LEVEL SET Control
SW-39	S1	Switch, FUNCTION
SW-37	S2	Switch, ROLL-OFF

## MISCELLANEOUS PARTS

M-366		Dust Cover
N-12		Knob, Push-on type
N-13		Knob, with set-screw
IN-68		Dial Glass
A-89		Mounting Template
CR-12		Rectifie
H-116		Cotter Pin (Used in Detent Assembly on STATION SELECTOR)
H-113		Dial-Glass Mounting Clips,
16X024		Feet, Padded
82A009		Dial Pointer

- Note: 1. Replace pilot lights only with No. 51 Bulb.  
2. Replace standard parts with parts of exact values.